

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 66

**THE CIVIL AVIATION (AIRCRAFT ACCIDENT AND INCIDENT
INVESTIGATIONS) REGULATIONS, 2022**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 66

The Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

*(Under sections 34(2) and 61 of the Civil Aviation Authority Act,
Cap. 354)*

IN EXERCISE of the powers conferred upon the Minister by sections 34(2) and 61 of the Civil Aviation Authority Act, and on the recommendation of by the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

2. Application

(1) These Regulations apply to activities following accidents and incidents wherever they occur.

(2) The specifications concerning the State of the Operator apply only when an aircraft is leased, chartered, or interchanged and when that State is not the State of Registry and if it discharges, in respect of these Regulations in part or in whole, the functions and obligations of the State of Registry.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“accident” means an Occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons

have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which—

- (a) a person is fatally or seriously injured as a result of—
 - (i) being in the aircraft;
 - (ii) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or
 - (iii) direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew;

- (b) the aircraft sustains damage or structural failure which—
 - (i) adversely affects the structural strength, performance, or flight characteristics of the aircraft; and
 - (ii) would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike; or

(c) the aircraft is missing or is completely inaccessible;

“accredited representative” means a person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State; the designated accredited representative will normally be from the State authority that investigates accidents;

“Act” means the Civil Aviation Authority Act, Cap. 354;

“adviser” means a person appointed by the State, on the basis of his or her qualifications, for the purpose of assisting the accredited representative in an investigation;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air, other than reactions of the air against the surface of the earth;

“air traffic control unit” means area control center, approach control unit, or aerodrome control tower;

“Air Traffic Service” means air traffic services and includes flight information service, alerting service, air traffic advisory service, air traffic control service, area control service, approach control service and aerodrome control service;

“Annex 13” means the Annex to the Convention on International Civil Aviation that contains the International Standards and Recommended Practices related to aircraft accident and incident investigations;

“appropriate authority” means—

(a) for flights over high seas, the relevant authority of the State of Registry; and

- (b) for flights over areas other than the high seas, the relevant authority of the State having sovereignty over the territory being over flown;

“authority” means the Uganda Civil Aviation Authority established by section 3 of the Act;

“contracting State” means any State which is a party to the Convention on International Civil Aviation (Chicago Convention, 1944);

“contributing factors” means actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident or incident occurring, or mitigated the severity of the consequences of the accident or incident, whose identification does not imply the assignment of fault or the determination of administrative, civil or criminal liability;

“crew member” means a person assigned by an air operator for duty on an aircraft during a flight duty period;

“dangerous goods” means articles or substances which are capable of posing a hazard to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to Technical Instructions;

“department” means any ministry, authority, organisation or other concerned institution of Uganda that has a direct interest in aircraft accidents or incidents;

“document” includes any correspondence, memorandum, book, plan, map, drawing, diagram, pictorial or graphic, film, sound recording, video tape, electronic files, data, aircraft documents, and any copy of the document;

“final draft report” means draft investigations report that is sent in confidence to departments in Uganda, other States and organisations involved in the investigations, inviting their significant and substantiated comments on the report;

“final report” means a State’s conclusive report on its investigations into an aircraft accident or incident which is issued by the authority and includes the pertinent factual information, analysis, conclusions and, when appropriate, associated safety recommendations;

“flight recorder” means any type of recorder installed in the aircraft for the purpose of complementing accident and incident investigations;

“incident” means an Occurrence, other than an accident, associated with the operation of an aircraft which affects or may affect the safety of operation;

“investigations” means a process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and contributing factors and when appropriate, the making of safety recommendations;

“investigations interim statement” means the public communication used by the appropriate authority on each anniversary of the accident or incident for informing those having a direct interest in the investigations regarding the progress of an ongoing investigations and any safety issues raised during the investigations;

“investigator” means a person delegated by the Accident and Investigation Unit to conduct investigations including the

determination of causes and contributing factors and when appropriate, the making of safety recommendations;

“investigator-in-charge” means a person charged, on the basis of his or her qualifications, with the responsibility for the organisation, conduct and control of an investigation;

“Non-Contracting State” means any State which is not a party to the Chicago Convention;

“maximum mass” means maximum certificated take-off mass;

“Occurrence” means any accident or incident associated with the operation of an aircraft;

“operator” means the person, organisation or enterprise engaged in or offering to engage in an aircraft operation;

“participant” means a person authorised by the appropriate authority to participate in an investigation being conducted by that authority because in the opinion of the authority that person has the expertise to contribute to achieving the authority’s mandate;

“pilot-in-command” means the pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight;

“preliminary report” means the communication used for the prompt dissemination of data obtained during the early stages of the investigations;

“safety recommendation” means a proposal of an accident investigations authority based on information derived from an investigation, made with the intention of preventing accidents or incidents, which in no case has the purpose of creating a presumption of blame or liability

for an accident or incident and may result from diverse sources, including safety studies;

“safety recommendation of global concern or SRGC” means a safety recommendation regarding a systemic deficiency having a probability of recurrence, with significant consequences at a global level, and requiring timely action to improve safety;

“serious incident” means an incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked; or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down;

“serious injury” means an injury which is sustained by a person in an accident and which—

- (a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was sustained;
 - (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose);
 - (c) involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage;
 - (d) involves injury to any internal organ;
 - (e) involves second- or third-degree burns, or any burns affecting more than 5 per cent of the body surface;
- or

- (f) involves verified exposure to infectious substances or injurious radiation.

“State aircraft” means aircraft used in military, customs, and police services of Uganda or of any other State or any other civil registered aircraft at the time performing a State function and fully converted to offer services to heads of States, military service, customs or police services or any other State;

“State of Design” means the State having jurisdiction over the organisation responsible for the type design;

“State of Manufacture” means the State having jurisdiction over the organisation responsible for the final assembly of the aircraft, engine, or propeller;

“State of Occurrence” means the State in the territory of which an accident or incident occurs;

“State of the Operator” means the State in which the operator’s principal place of business is located or, if there is no such place of business, the operator’s permanent residence;

“State of Registry” means the State on whose register the aircraft is entered;

“State Safety Programme or SSP” means an integrated set of regulations and activities aimed at improving safety;

“statement” means the whole or any part of an oral, written, or recorded statement relating to an aircraft accident or incident given by the author of the statement to the appropriate authority;

“Unit” means the Accident and Incident Investigations Unit established under section 38 of the Act.

PART II—GENERAL

4. Objective of investigations

The objective of the investigation of an accident or incident under these Regulations shall be—

- (a) the prevention of accident and incidents; and
- (b) not to apportion blame or liability.

5. Manual of accident and incident investigation

(1) The Unit shall have in place, a manual of accident and incident investigations.

(2) The manual in subregulation (1) shall contain information and instructions necessary to enable investigators to perform their duties.

6. Investigators of accident and serious incident

(1) For the purposes of carrying out aircraft accident and serious incident investigations, the chief investigator shall appoint investigators of accidents and serious incidents.

(2) The chief investigator shall nominate the investigator-in charge among the investigators, to lead an investigation into an accident or serious incident.

(3) The investigator-in charge may delegate any of his or her powers and obligations under these Regulations to the deputy investigator-in charge during the period of investigations.

7. Independence of investigations

The Unit investigating accident and incidents shall be independent from the State aviation authorities and other entities that may interfere with the conduct or objectivity of an aircraft accident and serious incident investigation.

8. Obligation to investigate

(1) Where an aircraft accident and serious incident occurs in Uganda, the chief investigator shall cause an investigation to be carried out into an accident or serious incident as follows—

- (a) where the accident or serious incident occurs in Uganda;
- (b) where the accident or serious incident occurs in any non-contracting state which does not intend to carry out an investigation of the accident or serious incident and involves an aircraft registered in Uganda or an aircraft operated by an operator whose principal base of operation is in Uganda;
- (c) where the accident or serious incident involves an aircraft registered in Uganda or an aircraft operated by an operator in Uganda and the investigations has been delegated to Uganda by another Contracting State by mutual arrangement and consent; or
- (d) where the accident or serious incident occurs in a location that cannot be definitely established as being in the territory of any State and involves an aircraft registered in Uganda.

(2) The aircraft may enter a joint investigation arrangement with military to provide for investigations in the event an accident involves a civilian aircraft and a military or State aircraft.

(3) The chief investigator may, where he or she expects to draw air safety lessons from an accident or serious incident, cause an investigation to be carried out into an incident which occurs—

- (a) in Uganda; or
- (b) outside Uganda involving an aircraft registered in Uganda or an aircraft operated by an operator in Uganda.

(4) Without prejudice to the power of the chief investigator under regulation 34 (3), the chief investigator may appoint any person

as an adviser to assist in carrying out an investigation under these Regulations.

(5) The chief investigator may, with the approval of the appropriate authority, delegate the task of carrying out an investigation into an accident or a serious incident to another Contracting State or accident investigations authority by mutual arrangement and consent.

(6) Where the chief investigator delegates the task of carrying out an investigation, he or she shall, facilitate the investigations carried out by the chief investigator appointed by the Contracting State conducting the investigations.

(7) Where the chief investigator is of the opinion that it would be desirable for public notice to be given that an investigation is taking place, he or she may do so, in such manner as he or she may deem fit.

(8) The notice referred to in subregulation (7) may, where the chief investigator thinks appropriate, state that any person who desires to make representations concerning the circumstances or causes of the accident or incident may do so orally or in writing within a time to be specified in the notice.

(9) Any person in possession of any item which may constitute evidence for the purpose of an investigation under these Regulations, shall hold and preserve the same and shall promptly hand them over to the chief investigator.

(10) Subject to subregulation (9), safe custody shall include protection against further damage, access by unauthorised persons, pilfering and deterioration.

9. Notification of accidents and serious incidents

(1) Where an aircraft accident or serious incident takes place—

- (a) the aircraft owner;

- (b) the aircraft operator;
- (c) the aircraft pilot;
- (d) the surviving crew member of the aircraft;
- (e) the handling agent;
- (f) the maintenance organisations;
- (g) the police;
- (h) the local authorities;
- (i) the airport operator or owner;
- (j) the air traffic controller;
- (k) the eyewitness; and
- (l) in the event of an Occurrence of an accident or incident in a foreign territory to an aircraft registered in Uganda, the relevant State of Occurrence, having knowledge of an accident or incident,

shall notify the authority and shall provide information as soon as possible and by the quickest means available.

(2) The notification to the authority shall be in plain language and shall contain as much of the information specified in subregulation (3) as is readily available; but the dispatch of the notification shall not be delayed due to the lack of complete information.

(3) A person specified in subregulation (1) shall, as soon as he or she becomes aware of an accident or serious incident, send a notification to the appropriate authority stating any of the following—

- (a) in the case of an accident, the identifying abbreviation “ACCID” or, in the case of a serious incident, the identifying abbreviation “INCID”;
- (b) the manufacturer, model, nationality and registration marks and serial number of the aircraft;

- (c) the name of the owner, operator, and hirer, if any, of the aircraft;
- (d) the name of the pilot-in-command of the aircraft and the number and nationality of the crew and passengers on board the aircraft at the time of the accident or serious incident;
- (e) the date and local time or Coordinated Universal Time of the accident or serious incident;
- (f) the last point of departure and the next point of intended landing of the aircraft;
- (g) the position of the aircraft with reference to some easily defined geographical point and the latitude and longitude;
- (h) in the case of an accident, the number of crew members, passengers or other persons respectively killed or seriously injured because of the accident;
- (i) a description of the accident or serious incident and the extent of damage to the aircraft so far as is known;
- (j) the physical characteristics of the area in which the accident or serious incident occurred and an indication of access difficulties or special requirements to reach the site;
- (k) the identification of the person sending the notice and where the accident or serious incident occurred outside Uganda, how the chief investigator and the accident investigations authority of the State of Occurrence may be contacted; and
- (l) the presence and description of dangerous goods on board the aircraft, if any.

10. Parties to investigations

(1) The chief investigator shall designate parties to participate in an investigation.

(2) The parties designated in subregulation (1), shall be limited to a person, government agency, company, and an association whose employees, functions, activities or products were involved in the accident or incident and who can provide suitable qualified technical personnel to actively assist in the investigations.

(3) The parties shall be under the direction of the chief investigator through their respective party representatives and party coordinators.

11. Acts of unlawful interference

(1) Where during an investigation the Unit becomes aware or suspects that an act of unlawful interference was involved, the chief investigator shall immediately initiate action to ensure that the security authorities of Uganda and of the State concerned are informed.

(2) For the purpose of this regulation, “act of unlawful interference” means an act or attempted act to jeopardise the safety or civil aviation and air transport, which includes—

- (a) unlawful seizure of an aircraft in flight or on the ground;
- (b) destroying an aircraft in service or on the ground and includes causing damage to the aircraft which renders the aircraft incapable of flying;
- (c) hostage taking on board an aircraft or at an airport;
- (d) forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility;
- (e) introduction of a weapon or hazardous device or material onto an aircraft or at an airport, intended for a criminal purpose;
- (f) use of an aircraft in service for the purpose of causing death, serious bodily injury, or serious damage to property or the environment;

- (g) unauthorised possession or introduction of a weapon or a hazardous device or material, at an airport or on board an aircraft;
- (h) destroying or damaging an air navigation facility or interfering with the operation of the air navigation facility in any way that is likely to endanger the safety of an aircraft, whether in flight or on the ground;
- (i) violence against a person on board an aircraft whether in flight or on the ground, where that act is likely to endanger the safety of the aircraft;
- (j) communicating information that is known to be false, intended to endanger the safety of an aircraft whether in flight or on the ground, crew, ground personnel or the public at an airport or on the premises of a civil aviation facility; or
- (k) unlawfully and intentionally using any device, substance, or weapon—
 - (i) to perform an act of violence against a person at an airport serving civil aviation which causes or is likely to cause serious injury or death;
 - (ii) to destroy or seriously damage the facilities of an airport serving civil aviation or an aircraft not in service located at the airport or disrupting the services of the airport, if that act endangers or is likely to endanger safety at that airport.

12. Crew involved in accidents

(1) A crew member shall forward to the Unit, a statement setting the facts, conditions, and circumstances relating to the accident or serious incident as they appear to the member as soon as possible after the accident or serious incident.

(2) Where the crew member is incapacitated, he or she shall submit the statement on accident or serious incident as soon as he or she is physically able to do so.

13. Foreign investigations

Where the Unit has been notified of an aircraft accident or serious incident that occurred outside the territory of Uganda involving a Uganda aircraft, an aircraft operated by a Uganda operator or an aircraft designed or manufactured in Uganda, the Unit shall—

- (a) acknowledge receipt of the notification;
- (b) provide the notifying State with the following information with the least possible delay—
 - (i) any relevant information regarding the aircraft and flight crew involved in the accident or serious incident; and
 - (ii) if Uganda is the State of the Operator, details of any dangerous goods on board the aircraft;
- (c) inform the notifying State as to—
 - (i) whether Uganda intends to appoint or has appointed an accredited representative; and
 - (ii) if such accredited representative is or has been appointed and shall be travelling to the State in which the investigation is being carried out, the contact details and the expected date of arrival of the accredited representative in such State; and
- (d) appoint an accredited representative, if requested to do so by the State conducting an investigation into an accident or a serious incident involving an aircraft of a maximum mass of over 2,250 kilograms.

14. Removal of damaged aircraft

(1) Where an accident or a serious incident occurs in Uganda, a person shall not—

- (a) have access to the aircraft involved in the accident or serious incident, the contents or the site of the accident

or serious incident, other than the chief investigator or an authorised person; or

- (b) move or interfere with the aircraft, its contents or the site of the accident or serious incident except under the authority of the chief investigator.

(2) Notwithstanding subregulation (1)—

- (a) the aircraft involved in an accident or a serious incident may be moved or interfered with to such an extent as may be necessary for all or any of the following purposes—

- (i) removing persons or animals—

- (ii) removing any mail, valuables or dangerous goods carried by the aircraft;

- (iii) preventing destruction by fire or other cause; and

- (iv) preventing any danger or obstruction to the public, air navigation or other transport; and

- (b) where the aircraft is wrecked in water, the aircraft or any contents may be moved to such an extent as may be necessary for bringing the aircraft or its contents to a place of safety.

(3) Subject to subregulation (2), a determination shall be made by the chief investigator to the extent of the damage to the aircraft in accordance with the guidance set out in Schedule 1 to these Regulations.

(4) Where the chief investigator has authorised any person to remove any goods or passenger baggage from the aircraft or to release any goods or passenger baggage from the custody of the chief investigator, that person may—

- (a) remove the goods or passenger baggage from the aircraft subject to the supervision of a police officer; and

- (b) release the goods or passenger baggage from the custody of the chief investigator subject to clearance by or with the

consent of an officer of customs if the aircraft has come from a place outside Uganda.

(5) Where the chief investigator is of the opinion that the aircraft involved in the accident or serious incident is likely to endanger or obstruct the public, air navigation or other transport, he or she may order the owner, operator or hirer of such aircraft to remove it to such place as the chief investigator may indicate.

(6) In the absence of the owner, operator or hirer, or in the event of non-compliance with the order given in accordance with subregulation(4), the chief investigator may remove or cause the removal of the aircraft and shall not be liable for any further damage that may occur during removal.

(7) In this regulation, “authorised person” means any person authorised by the chief investigator either generally or specifically to have access to any aircraft involved in an accident or a serious incident and includes any police officer or any officer of customs.

(8) The police officer referred to in subregulation (7) shall be responsible for the maintenance of law and order and preservation of the site of accident pending the arrival of the chief investigator.

15. Obstruction of investigations

(1) A person shall not obstruct an investigator or any person acting under the authority of the chief investigator in the exercise of any rights, powers or duties under these Regulations.

(2) A person shall not, without reasonable cause, fail to comply with any summons of—

- (a) the chief investigator carrying out an investigation; or
- (b) any person empowered to exercise the powers of the chief investigator under these Regulations.

(3) The onus of proving reasonable cause for failing to comply with duly served summons shall lie on the person relying on such excuse.

16. Assistance to survivors and families

(1) The chief investigator shall ensure assistance to the survivors and to the families of victims and survivors of an accident which is the subject of an ongoing investigation by—

- (a) communicating all relevant information in time;
- (b) facilitating their entry into and exit from the country and the repatriation of victims; and
- (c) coordinating assistance efforts by the Government, airlines, humanitarian and other organisations.

(2) The Unit shall develop guidelines for better implementation of subregulation (1).

17. Release and disposal of aircraft and wreckage

(1) Where the retention of the aircraft involved in an accident or incident, parts of the aircraft or aircraft wreckage or any contents of the aircraft is no longer necessary for the purposes of an investigations, the chief investigator shall release custody of the aircraft, parts, wreckage, or contents as follows—

- (a) if it is an aircraft registered in Uganda—
 - (i) to the owner of the aircraft, parts, wreckage or contents;
 - (ii) where the owner is dead, to his or her personal representative; or
 - (iii) to a person authorised in writing by the owner or his or her personal representative to take custody on behalf of the owner or the personal representative of the owner; and

(b) in any other case, to the person designated by the State of Registry or the State of the Operator, as the case may be.

(2) The chief investigator shall—

(a) where he or she intends to release aircraft wreckage, issue a notice to a person referred to in subregulation (1); or

(b) where such person cannot be traced, by publishing the notice in at least two daily newspapers of wide circulation in the State of Occurrence giving details of the aircraft wreckage and specifying the period during which it shall be removed.

(3) The person to whom the notice has been issued may, before the expiry of the notice and for good cause, apply in writing to the chief investigator for an extension of the period within which the wreckage may be removed.

(4) Where a person to whom custody of the aircraft, parts, wreckage or contents is to be released fails to take custody within the period specified in the notice, the aircraft, parts, wreckage or contents may be disposed of in such manner as the chief investigator deems fit.

(5) The expenses incurred by the chief investigator in disposing of the aircraft, parts, wreckage, or contents shall be recoverable from the owner or operator of the aircraft or both.

18. Protection of evidence and safe custody of aircraft

(1) The State of Occurrence shall take all reasonable measures to protect the evidence and to maintain safe custody of the aircraft and its contents for such a period as may be necessary for the purposes of an investigations.

(2) The protection of evidence shall include the preservation, by photographic or other means, of any evidence which might be removed, effaced, lost, or destroyed.

(3) Subject to subregulation (1), safe custody shall include protection against further damage, access by unauthorised persons, pilfering and deterioration.

19. Request from State of Registry, State of Operator, State of Design or State of Manufacture

(1) Where a request is received from the State of Registry, the State of the Operator, the State of Design or the State of Manufacture that the aircraft, its contents, and any other evidence remain undisturbed pending inspection by an accredited representative of the requesting State, the State of Occurrence shall take all necessary steps to comply with the request, so far as this is reasonably practicable and compatible with the proper conduct of the investigations.

(2) Notwithstanding subregulation (1), the aircraft may be moved to the extent necessary to extricate persons, animals, mail and valuables, to prevent destruction by fire or other causes, or to eliminate any danger or obstruction to air navigation, to other transport or to the public, and provided that it does not result in undue delay in returning the aircraft to service, where this is practicable.

20. Release from custody by State of Occurrence

(1) The State of Occurrence shall release custody of the aircraft, its contents or any parts of the aircraft as soon as they are no longer required in the investigations, to any person or persons duly designated by the State of Registry or the State of the Operator, where applicable.

(2) The State of Occurrence shall facilitate access to the aircraft, its contents or any parts of the aircraft, provided that, if the aircraft, its contents, or any of its parts lie in an area within which the State finds it impracticable to grant such access, the State shall effect removal to a point where access can be given.

21. Responsibility of notification of accident and incident

(1) The State of Occurrence shall forward a notification of an accident or serious incident, with a minimum delay and by the most suitable and quickest means available, to the—

- (a) State of Registry;
- (b) State of the Operator;
- (c) State of Design;
- (d) State of Manufacture; and
- (e) International Civil Aviation Organisation, when the aircraft involved is of a maximum mass of over 2,250 kilograms or is a turbojet-powered aeroplane.

(2) Notwithstanding subregulation (1), where the State of Occurrence is not aware of a serious incident, the State of Registry or the State of the Operator, as appropriate, shall forward a notification of such an incident to the State of design, manufacture and Occurrence.

22. Format and content of notification

(1) The notification in regulation 21 (1) shall be in plain language.

(2) The dispatch of the notification shall not be delayed due to lack of complete information as follows—

- (a) for accidents the identifying abbreviation “ACCID”, for serious incidents “SINCID”; for incidents “INCID”;
- (b) manufacturer, model, nationality and registration marks, and serial number of the aircraft;
- (c) name of owner, operator, and hirer, if any, of the aircraft;

- (d) qualification of the pilot-in-command, and nationality of crew and passengers;
- (e) date and time (local time or UTC) of the accident or serious incident;
- (f) last point of departure and point of intended landing of the aircraft;
- (g) position of the aircraft with reference to some easily defined geographical point and latitude and longitude;
- (h) number of crew and passengers aboard, killed and seriously injured;
- (i) description of the accident or serious incident and the extent of damage to the aircraft so far as is known;
- (j) an indication to what extent the investigations will be conducted or is proposed to be delegated by the State of Occurrence;
- (k) physical characteristics of the accident or serious incident area, as well as an indication of access difficulties or special requirements to reach the site;
- (l) identification of the originating authority and means to contact the chief investigator and the accident investigations authority of the State of Occurrence at any time; and
- (m) presence and description of dangerous goods on board the aircraft.

(3) The format and contents of the notification are specified in Schedule 2 to these Regulations.

23. Notification language

The notification shall be prepared in English language, whenever it is possible to do so without causing undue delay.

24. Additional information

The State of Occurrence shall dispatch the details omitted from the notification as well as other known relevant information, as soon as possible.

*Responsibility of State of Registry, State of Operator,
State of Design and State of Manufacture*

25. Action taken on receipt of notification

(1) The State of Registry, State of the Operator, State of Design and State of Manufacture may acknowledge receipt of the notification of an accident or serious incident.

(2) The State of Registry, State of the Operator, State of Design and State of Manufacture shall, as soon as possible, provide the State of Occurrence with any relevant information available regarding the aircraft and flight crew involved in an accident or serious incident upon receipt of the notification.

(3) Subject to subregulation (2), each State shall inform the State of Occurrence whether it intends to appoint an accredited representative and where an accredited representative is appointed, the name, contact details and the expected date of arrival of the accredited representative.

(4) The State of the Operator shall, upon receipt of the notification, with a minimum delay and by the most suitable and quickest means available, provide the State of Occurrence with details of any dangerous goods on board the aircraft.

Responsibility of State of Registry

26. Responsibility of State of Registry to notify accident and incident

Where the State of Registry institutes investigations of an accident or serious incident, that State shall forward a notification, with a minimum delay and by the most suitable and quickest means available, to the—

- (a) State of the Operator;
- (b) State of Design;
- (c) State of Manufacture; and
- (d) International Civil Aviation Organisation , when the aircraft involved is of a maximum mass of over 2,250 kilograms or is a turbojet-powered aeroplane.

*Responsibility of State of Operator, State of
Design and State of Manufacture*

27. Action taken on receipt of notification by State of Operator, State of Design and State of Manufacture

(1) The State of the Operator, the State of Design and the State of Manufacture, on receipt of a notification, may acknowledge receipt of the notification of an accident or serious incident.

(2) Upon receipt of the notification, the State of the Operator, the State of Design and the State of Manufacture shall, upon request, provide the State of Registry with any relevant information available to them regarding the flight crew and the aircraft involved in the accident or serious incident.

(3) Subject to subregulation(2), the State shall inform the State of Registry whether it intends to appoint an accredited representative, and where an accredited representative is appointed, the name, contact details and the expected date of arrival of the accredited representative.

(4) The State of the Operator shall, upon receipt of the notification, with a minimum delay and by the most suitable and quickest means available, provide the State of Registry with details of any dangerous goods on board the aircraft.

PART IV— INVESTIGATIONS

Responsibility for Instituting and Conducting Investigations

28. Conduct of investigations by State of Occurrence

(1) The State of Occurrence shall institute an investigation into the circumstances of the accident and shall be responsible for the conduct of the investigations.

(2) The State of Occurrence may delegate the whole or any part of the investigations to another State by mutual arrangement and consent.

(3) The State of Occurrence shall institute an investigation into the circumstances of a serious incident when the aircraft is of a maximum mass of over 2,250 kilograms and such a State may delegate the whole or any part of such investigations to another State by mutual arrangement and consent.

(4) The State of Occurrence shall investigate accident and incident involving unmanned aircraft systems with a design or operational approval.

(5) Subject to this regulation, the State of Occurrence shall use every means to facilitate the investigations.

(6) Where the State of Occurrence does not institute and conduct an investigation, and does not delegate the investigation to another State or a regional accident and incident investigation organisation, as set out in these Regulations, the State of Registry or, in the following order—

- (a) the State of the Operator;
- (b) the State of Design; or
- (c) the State of Manufacture,

is entitled to request in writing to the State of Occurrence to delegate the conducting of the investigation.

(7) Where the State of Occurrence gives express consent or does not reply to such a request within thirty days, the State making the request shall institute and conduct the investigation with such information as is available.

29. Accidents or incidents in a non-Contracting State

Where the accident or the serious incident has occurred in the territory of a Non-Contracting State which does not intend to conduct an investigation in accordance with ICAO Annex 13,—

- (a) the State of Registry;
- (b) the State of the Operator;
- (c) the State of Design; or
- (d) the State of Manufacture;

shall institute and conduct an investigation in cooperation with the State of Occurrence but, failing such cooperation, shall conduct an investigation with such information as is available.

30. Accidents or incidents outside territory of State

(1) The State of Registry shall institute and conduct any necessary investigations of the accident or serious incident where the location of an accident or serious incident cannot be established as being in the territory of any State.

(2) Subject to subregulation (1), the State of Registry may delegate the whole or any part of the investigations to another State by mutual arrangement and consent.

(3) A State nearest to the scene of an accident in international waters shall provide such assistance as they are able and shall, likewise, respond to requests by the State of Registry.

(4) Where the State of Registry is a Non-Contracting State which does not intend to conduct an investigation in accordance with these Regulations, the State of the Operator or, failing that, the State

of Design or the State of Manufacture shall endeavor to institute and conduct an investigation.

(5) Subject to subregulation (4), the State of the Operator, the State of Design or State of Manufacture may delegate the whole or any part of the investigations to another State by mutual arrangement and consent.

(6) Where the State of Registry is a non-Contracting State which does not intend to conduct an investigation in accordance with Annex 13, the State of the Operator or, failing that, the State of Design or the State of Manufacture shall endeavour to institute and conduct an investigation.

(7) Subject to subregulation (6), the State of Registry may delegate the whole or any part of the investigation to another State by mutual arrangement and consent.

(8) The delegation of an investigation does not absolve the State of Registry from its obligation under ICAO Annex 13.

31. Responsibility of the State conducting investigations

(1) The Unit shall have independence in the conduct of the investigations and unrestricted authority over its conduct, consistent with the provisions of these Regulations.

(2) Subject to subregulation (1), the investigations shall include—

- (a) the gathering, recording and analysis of all relevant information on that accident or incident;
- (b) the protection of certain accident and incident investigation records in accordance with these Regulations;
- (c) where appropriate, the issuance of safety recommendations;
- (d) where possible, the determination of the causes or contributing factors; and

(e) the completion of the final report.

(3) Where feasible, the scene of the accident shall be visited, the wreckage examined and statements taken from witnesses.

(4) Subject to subregulation(3), the extent of the investigations and the procedure to be followed in carrying out such an investigation shall be determined by the Unit, depending on the lessons the Unit expects to draw from the investigations for the improvement of safety.

(5) Any investigations conducted in accordance with these Regulations shall be separate from any judicial or administrative proceedings to apportion blame or liability.

(6) The Unit shall develop documented policies and procedures detailing its accident investigations duties and shall include organisation and planning, investigations and reporting.

(7) The State shall have unrestricted access to all evidential material without delay to any investigations conducted under these Regulations.

(8) The State shall ensure cooperation between the Unit and judicial authorities so that an investigation is not impeded by administrative or judicial investigations or proceedings.

32. Designation of investigator-in-charge

The State conducting investigations shall designate an investigator-in-charge of a particular accident or serious incident investigation and shall initiate the investigation immediately.

33. Access and control by investigator-in-charge

The investigator-in-charge shall have unhampered access to the wreckage and all relevant material, including flight recorders and Air Traffic Service records, and shall have unrestricted control over it to ensure that a detailed examination can be made without delay by authorised personnel participating in the investigations.

34. Powers of chief investigator

(1) Where the whole or part of the investigations is carried out in Uganda, the chief investigator or his or her assigned representative shall have rights of access specified in subregulations (2) and (3) to carry out an investigation into an accident or incident in the most efficient way and within the shortest period possible.

(2) The chief investigator or his or her representative shall have—

- (a) powers to secure and preserve the scene of the accident;
- (b) access to the results of examination of the bodies of victims or tests made on samples taken from the bodies of the victims;
- (c) immediate access to the results of examinations of the persons involved in the operation of the aircraft or tests made on samples taken from such persons; and
- (d) free access to any relevant information or records held by the owner, the operator, the operator's maintenance contractors and sub-contractors, the hirer, the designer or the manufacturer of the aircraft and by the authorities for civil aviation or airport operation or Air Traffic Service.

(3) The chief investigator or his or her representative shall—

- (a) by summons under his or her authority—
 - (i) call before him or her and interview any person as he or she deems appropriate; and
 - (ii) require such person to answer any question or furnish any information or produce any books, papers, documents, licences, certificates, and articles which he or she may consider relevant;
- (b) take statements from all such persons as he or she deems fit and require each of such persons to make and sign a

declaration of the truth of the statement made by him or her;

- (c) on production, if required, of his or her credentials—
 - (i) enter and inspect any place, building or aircraft the entry or inspection appears to him or her to be necessary for the purposes of the investigations; and
 - (ii) remove, test, take measures for the preservation of or otherwise deal with any aircraft other than an aircraft involved in the accident or incident where it appears to him or her to be necessary for the purposes of the investigations;
- (d) take possession of, examine, remove, test or take measures for the preservation of any object or evidence he or she considers necessary for the purposes of the investigations;
- (e) order for immediate listing of evidence and removal of debris or components for examination or analysis purposes;
- (f) order for the readout of the flight recorders;
- (g) in the case of a fatal accident, require a complete autopsy examination of fatally injured flight crew, and, when necessary, passengers and cabin crew by a pathologist, and if a pathologist experienced in the investigations of aircraft accidents is available, by such pathologist;
- (h) where appropriate, require the medical and toxicological examination of the crew, passengers and aviation personnel involved in the accident or incident by a medical practitioner, and if a medical practitioner experienced in the investigations of aircraft accidents is available, by such medical practitioner;
- (i) require the crew, passengers and aviation personnel involved in the accident or incident to undergo such other

tests including a breathalyzer test within reasonable time for the purposes of the investigations; and

- (j) seek such advice or assistance as he or she considers necessary for the purposes of the investigations.

(4) The chief investigator may delegate to his or her deputy or any other investigator the rights and powers vested in him or her in subregulations (2) and (3), where the whole or any part of the investigations is carried out in Uganda.

(5) Without prejudice to the general effect of subregulation (3), the chief investigator may request another contracting State to provide such information, facilities or experts as he or she may consider necessary for the purpose of an investigation.

(6) The chief investigator shall take all reasonable measures to protect the evidence and to maintain safe custody of the aircraft and its contents for such a period as may be necessary for the purposes of an investigation.

(7) The flight crew involved in an aircraft accident shall undergo an aviation medical assessment by a designated medical examiner before resuming duties.

35. Form and conduct of investigations

- (1) An investigation shall not be open to the public.

(2) The extent of investigations and the procedure to be followed in carrying out investigations required or authorised under these Regulations shall be determined by the chief investigator taking into account—

- (a) the objective of the investigations set out in these Regulations;
- (b) the lessons expected to be drawn from the aircraft accident or incident for the improvement of safety; and

- (c) the complexity of the investigations.

36. Flight recorders - accident and incident

(1) Effective use in the readout and analysis of flight recorders for the investigations of an accident or an incident shall be made in accordance with the guidelines set out in Schedule 3 to these Regulations.

(2) The State conducting investigations shall arrange for the read-out of the flight recorders without delay.

(3) In the event that the State conducting the investigations of an accident or an incident does not have adequate facilities to read out the flight recorders, the State shall use the facilities made available to it by other States, giving consideration to the following—

- (a) capabilities of the read-out facility;
- (b) timeliness of the read-out; and
- (c) location of the read-out facility.

(4) The requirements for the recording of flight data are contained in the Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022.

37. Ground-based recordings

(1) The effective use shall be made of available ground-based recordings in the investigation of an accident or an incident.

(2) The requirements for the recording of radar surveillance data and ATS communications are contained in the Civil Aviation (Air Traffic Services) Regulations, 2022.

38. Autopsy examinations

The State conducting investigations into a fatal accident shall arrange for expeditious and complete autopsy examination of fatally injured flight crew and, subject to a particular circumstance, of fatally injured passengers and cabin attendants, by a pathologist, preferably experienced in accident investigations.

39. Medical examinations

Where appropriate, the State conducting investigations shall arrange for expeditious medical examination of the crew, passengers and aviation personnel involved, by a physician, preferably experienced in accident investigations.

40. Coordination with judicial authorities

Where appropriate, the State conducting investigations shall ensure the coordination between the chief investigator and the judicial authorities while paying particular attention to evidence which requires prompt recording and analysis for the investigations to be successful, such as the examination and identification of victims and read-outs of flight recorder recordings.

41. Informing aviation security authorities

Where, in the course of an investigation it becomes known, or it is suspected, that an act of unlawful interference was involved, the investigator-in-charge shall immediately initiate an action to ensure that the aviation security authorities of the State concerned are informed.

42. Protection of accident and incident investigations records

(1) The State conducting investigations of an accident or incident shall not make the following records, subject to the guidelines set out in Schedule 4 to these Regulations, available for purposes other than accident or incident investigations, unless the competent court of law determines, in accordance with these Regulations that their disclosure or use outweighs the likely adverse domestic and international impact such action may have on that or any future investigation—

- (a) cockpit voice recordings and airborne image recordings and any transcripts from such recordings; and
- (b) records in the custody or control of the accident investigations authority being—

- (i) all statements taken from persons by the accident investigations authority in the course of their investigations;
- (ii) all communications between persons having been involved in the operation of the aircraft;
- (iii) medical or private information regarding persons involved in the accident or incident;
- (iv) recordings and transcripts of recordings from air traffic control units;
- (v) analysis of and opinions about information, including flight recorder information, made by the accident investigations authority and accredited representatives in relation to the accident or incident; and
- (vi) the draft final report of an accident or incident investigation.

(2) The State shall determine whether any other records obtained or generated by the accident investigations authority, as part of an accident or incident investigations, need to be protected in the same way as the records listed in this regulation.

(3) The records shall be included in the final report or its appendices which are pertinent to the analysis of the accident or incident.

(4) The parts of the records considered not relevant to the analysis shall not be disclosed.

(5) The names of the persons involved in the accident or incident shall not be disclosed to the public by the accident investigations authority.

(6) The State shall ensure that requests for records in the custody or control of the accident investigations authority are directed to the original source of the information, where available.

(7) The Unit shall retain, where possible, only copies of records obtained in the course of an investigation.

(8) The State shall take measures to ensure that audio content of cockpit voice recordings as well as image and audio content of airborne image recordings are not disclosed to the public.

(9) The State issuing or receiving a draft final report shall take measures to ensure that it is not disclosed to the public.

(10) The protection of the accident and incident investigations records shall apply from the time an accident or incident occurs and shall continue after the publication of the final report.

(11) Additional requirements on the protection of accident and incident investigation records are specified in Schedule 4 to these Regulations.

43. Reopening of investigations

(1) The chief investigator shall recommend to the appropriate authority to reopen an investigation, where new and significant evidence becomes available after the accident or serious incident investigation has been closed.

(2) The chief investigator shall cause the investigation of an incident other than a serious incident to be re-opened where evidence has been disclosed after the completion of the investigation which, in his or her opinion, is new and significant.

(3) Where the investigation of an accident or a serious incident has been instituted by another Contracting State, the appropriate

authority shall obtain the consent of that State before causing the investigations to be reopened under subregulation (1).

(4) Any investigation which is reopened shall be carried out in accordance with these Regulations.

(5) Where in the case of a missing aircraft following an official search is subsequently located, consideration shall be given to reopening the investigations.

44. Return and disposal of records

(1) The chief investigator shall, after the completion of the investigations or at any time determined by the chief investigator, return the aircraft records or any documents containing factual information concerning an accident or incident to the persons from whom they were obtained, unless they are still required for judicial proceedings or other proceedings.

(2) The records and information referred to in subregulation (1) not claimed by or returned to the persons from whom they were obtained, may be disposed of in any manner that the chief investigator considers fit after a period of three years.

45. Accident and incident information from any other State

(1) The State shall, on request from the State conducting the investigations of an accident or an incident, provide that State with all the relevant information available to it.

(2) The State shall cooperate with other States to determine the limitations on disclosure or use that shall apply to information before it is exchanged between them for the purposes of an accident or incident investigations.

(3) The facilities or services of any State which have been, or would normally have been, used by an aircraft prior to an accident or an incident, and which has information pertinent to the

investigations, shall provide such information to the State conducting the investigations.

*Responsibility of State of registry and
State of Operator*

46. Flight recorders - accidents and serious incidents

(1) Where an aircraft involved in an accident or a serious incident lands in the State other than the State of Occurrence, the State of Registry or the State of the Operator shall, on request from the State conducting the investigations, furnish the State conducting the investigations with the flight recorder records and, if necessary, the associated flight recorders.

(2) The State of Registry and the State of the Operator, on request from the State conducting investigations, shall provide pertinent information on any organisation whose activities may have directly or indirectly influenced the operation of the aircraft.

47. Rights of participation in investigations

(1) The State of Registry, the State of the Operator, the State of Design and the State of Manufacture shall each be entitled to appoint an accredited representative to participate in the investigations.

(2) The State of Registry or the State of the Operator shall appoint one or more advisers, proposed by the operator, to assist its accredited representative to participate in the investigations.

(3) Where neither the State of Registry, nor the State of the Operator appoints an accredited representative, the State conducting investigations may invite the operator to participate, subject to the procedures of the State conducting the investigations.

(4) The State of Design and the State of Manufacture shall be entitled to appoint one or more advisers, proposed by the organisations responsible for the type design and the final assembly of

the aircraft, to assist their accredited representatives to participate in the investigations.

(5) Where neither the State of Design nor the State of Manufacture appoints an accredited representative, the State conducting investigations may invite the organisations responsible for the type design and the final assembly of the aircraft to participate, subject to the procedures of the State conducting the investigations.

48. Obligation to appoint accredited representatives

Where the State conducting an investigation of an accident to an aircraft of a maximum mass of over 2,250 kilograms specifically requests participation by the State of Registry, the State of the Operator, State of Design or State of Manufacture, and the State concerned shall each appoint an accredited representative to participate in the investigations.

49. Right of participation by any other State

(1) A State which on request provides information, facilities or experts to the State conducting investigations shall be entitled to appoint an accredited representative to participate in the investigations.

(2) A State that provides an operational base for field investigation or is involved in search and rescue or wreckage recovery operations, or is involved as a State of a code-share or alliance partner of the operator, may be invited to appoint an accredited representative to participate in the investigation.

50. Entitlement of accredited representatives

(1) The State entitled to appoint an accredited representative shall be entitled to appoint one or more advisers to assist the accredited representative in the investigations.

(2) Advisers assisting the accredited representatives shall be permitted, under the accredited representatives' supervision, to participate in the investigations to the extent necessary to enable the accredited representatives to make their participation effective.

51. Participation by accredited representatives and advisers

(1) Participation in the investigations shall confer accredited representatives and adviser's entitlement to participate in all aspects of the investigations, under the control of the investigator-in-change, in particular to—

- (a) visit the scene of the accident;
- (b) examine the wreckage;
- (c) obtain witness information and suggest areas of questioning;
- (d) have full access to all relevant evidence as soon as possible;
- (e) receive copies of all pertinent documents;
- (f) participate in read-outs of recorded media;
- (g) participate in off-scene investigative activities such as component examinations, technical briefings, tests and simulations;
- (h) participate in investigations progress meetings including deliberations related to analysis, findings, causes, contributing factors and safety recommendations; and
- (i) make submissions in respect of the various elements of the investigations.

(2) The participation of States other than the State of Registry, the State of the Operator, the State of Design and the State of Manufacture may be limited to matters which entitle such States to participate in accordance with regulation 49.

52. Obligations of accredited representatives and advisers

Accredited representatives and their advisers shall—

- (a) provide the State conducting the investigations with all relevant information available to them; and

- (b) not divulge information on the progress and the findings of the investigations without the express consent of the State conducting the investigations.

53. States that suffered fatalities or serious injuries to their citizens

(1) A State which has a special interest in an accident by virtue of fatalities or serious injuries to its citizens shall be entitled to appoint an expert who shall be entitled to—

- (a) visit the scene of the accident;
- (b) have access to the relevant factual information which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
- (c) receive a copy of the final report.

(2) The provisions of subregulation(1) shall not prevent the state from assisting in the identification of victims and in meetings with survivors from that State.

(3) When conducting the investigation, the Unit shall release at least during the first year of the investigation, established factual information and indicate the progress of the investigation in a timely manner.

(4) A State which has a special interest in an accident by virtue of fatalities or serious injuries to its citizens shall be entitled to appoint an expert who shall be entitled to—

- (a) visit the scene of the accident;
- (b) have access to the relevant factual information which is approved for public release by the State conducting the investigation, and information on the progress of the investigation; and
- (c) receive a copy of the final report.

54. Rights and entitlement of States

(1) A state which has a special interest in an accident by virtue of fatalities or serious injuries to its citizens shall be entitled to appoint an expert who shall be entitled to—

- (a) visit the scene of the accident;
- (b) have access to the relevant factual information which is approved for public release by the State conducting the investigations, and information on the progress of the investigations; and
- (c) receive a copy of the final report.

(2) The provisions of subregulation (1), shall not prevent the State from assisting in the identification of victims and in meetings with survivors from that State.

(3) The State conducting investigations shall release, at least during the first year of the investigations, established factual information and indicate the progress of the investigations in a timely manner.

55. Format of final report

The format of the final report shall be as specified in Schedule 5 to these Regulations and may be adapted to the circumstances of the accident or incident.

56. Consent for release of information

The State shall not circulate, publish or give access to a draft final report or any part of the report, or any document obtained during an investigation of an accident or incident, without the express consent of the State which conducted the investigations, unless the report or document has already been published or released by the State which conducted the investigations.

57. Responsibility of State conducting investigations

(1) The State conducting the investigations shall send a copy of the final draft report to the following States requesting for

their significant and substantiated comments on the report as soon as possible—

- (a) the State that instituted the investigation;
- (b) the State of Registry;
- (c) the State of the Operator;
- (d) the State of Design;
- (e) the State of Manufacture; and
- (f) any State that participated in the investigations under these Regulations.

(2) Where the State conducting the investigations receives comments within sixty days of the date of the transmittal letter of the final draft report, the State shall either amend the draft final report to include the substance of the comments received or, if desired by the State that provided comments, append the comments to the final report.

(3) Where the State conducting the investigations does not receive comments within sixty days of the date of the first transmittal letter of the final draft report, the State shall issue the final report in accordance with these Regulations, unless an extension of that period has been agreed by the States concerned.

(4) The State conducting the investigations shall send, through the State of the Operator, a copy of the draft final report to the operator to enable the operator to submit comments on the final draft report.

(5) The State conducting the investigations shall send, through the State of Design and the State of Manufacture, a copy of the final draft report to the organisations responsible for the type design and the final assembly of the aircraft to enable them to submit comments on the final draft report.

(6) A person shall not circulate, publish, disclose or give access to any draft report or any part of its contents or any documents obtained during an investigation of an aircraft accident or incident unless the report has already been published by the chief investigator.

58. Recipient States of final report

The final report of the investigations of an accident shall be sent with a minimum delay by the State conducting the investigations to—

- (a) the State that instituted the investigation;
- (b) the State of Registry;
- (c) the State of the Operator;
- (d) the State of Design;
- (e) the State of Manufacture;
- (f) any State that participated in the investigation;
- (g) any State having suffered fatalities or serious injuries to its citizens; and
- (h) any State that provided relevant information, significant facilities or experts.

59. Release of final report

(1) In the interest of accident prevention, the State conducting the investigations of an accident or incident shall make the final report publicly available as soon as possible and, if possible, within twelve months from the date of Occurrence of the accident or incident.

(2) Where the report cannot be made publicly available within twelve months, the State conducting the investigations shall make an investigation interim statement publicly available on each anniversary of the Occurrence, detailing the progress of the investigation and any safety issues raised.

(3) Where the State that has conducted an investigation into an accident or an incident involving an aircraft of a maximum mass of

over 5,700 kilograms has released a final report, that State shall send to the International Civil Aviation Organisation a copy of the final report.

(4) Subject to subregulation (3), where the State conducting the investigation gives express consent or does not reply to the request within thirty days, the State making the request shall release a statement after coordinating with participating States.

(5) Where the State that has conducted an investigation into an accident or an incident involving an aircraft of a maximum mass of over 5,700 kilograms has released a final report, that State shall send to the International Civil Aviation Organisation a copy of the final report.

(6) A person shall not circulate, publish, disclose or give access to any draft report or any part of its contents or any documents obtained during an investigation of an aircraft accident or incident unless the report has already been published by the chief investigator.

60. Safety recommendations

(1) At any stage of the investigations of an accident or incident, the accident investigations authority of the State conducting investigation shall recommend in a dated transmittal correspondence to the appropriate authorities, including those in other States, any preventive action that the State considers necessary to be taken promptly to enhance aviation safety.

(2) Precedence for the issuance of safety recommendations from an accident or incident investigation shall be given to the State conducting the investigation and in the interest of safety, other States participating in the investigation may issue safety recommendations after coordinating with the State conducting the investigation.

(3) The Unit shall address, where appropriate, any safety recommendations arising out of its investigation in a dated transmittal correspondence to the accident investigation authorities of other States concerned and, where International Civil Aviation Organisation documents are involved, to International Civil Aviation Organisation.

(4) A State issuing a safety recommendation of global concern (SRGC) shall inform ICAO of the issuance of that recommendation and its responses in dated transmittal correspondence, even where the SRGC is not addressed to ICAO.

61. Recipients of safety recommendations

Safety recommendations issued by the appropriate authority shall be sent to persons or organisations of the aviation community that have a direct interest in the safety issue that was the basis for the safety recommendation, as well as to other members of the aviation community who would benefit from the information.

Responsibility of a State Receiving or Issuing Safety Recommendations

62. Action on safety recommendations

(1) A person who receives safety recommendations shall inform the proposing State, within ninety days of the date of the transmittal correspondence, of the preventive action taken or under consideration, or the reasons why no action shall be taken.

(2) A person who investigates or any State issuing a safety recommendation, shall implement procedures to record the responses received under subregulation (1), to the safety recommendation issued.

(3) A person who receives a safety recommendation shall implement procedures to monitor the progress of the action taken in response to that safety recommendation.

(4) A person or authority in Uganda to whom a recommendation has been communicated shall, without delay—

- (a) take that recommendation into consideration and, where appropriate, act upon it;
- (b) send the recommendation to the chief investigator—

- (i) with full details of the measures, if any, it has taken or proposes to take to implement the recommendation and, if such measures are to be implemented, the schedule for the implementation; or
- (ii) a full explanation as to why no measures shall be taken to implement the recommendation; and
- (c) give notice to the chief investigator if at any time any information provided to him or her or under paragraph (b) concerning the measures it proposes to take or the schedule for securing the implementation of the recommendation is rendered inaccurate by any change of circumstances.

(5) A recommendation for preventive action or safety recommendation shall, in no case, create a presumption of liability for an aircraft accident or incident.

(6) Where a recommendation for preventive action or a safety recommendation has been forwarded to the appropriate authority or to the investigator-in-charge by another contracting State, the appropriate authority or investigator-in-charge shall notify that State of the preventive action taken or under consideration or the reasons as to why no action shall be taken.

PART V—ACCIDENT AND INCIDENT DATA REPORT

63. Accidents to aircraft over 2,250 kilograms

Where the aircraft involved in an accident is of a maximum mass of over 2,250 kilograms, the State conducting the investigations shall send the preliminary report to—

- (a) the State of Registry or the State of Occurrence, as appropriate;
- (b) the State of the Operator;

- (c) the State of Design;
- (d) the State of Manufacture;
- (e) any State that provided relevant information, significant facilities or experts; and
- (f) the International Civil Aviation Organisation.

64. Accidents of aircraft of 2,250 kilograms or less

Where an aircraft, not covered under regulation 63, is involved in an accident and where airworthiness or matters considered to be of interest to other States are involved, the State conducting the investigations shall forward the preliminary report to—

- (a) the State of Registry or the State of Occurrence, as appropriate;
- (b) the State of the Operator;
- (c) the State of Design;
- (d) the State of Manufacture; and
- (e) any State that provided relevant information, significant facilities or experts.

65. Language of preliminary report

The preliminary report shall be submitted to appropriate States and to the International Civil Aviation Organisation in the English language.

66. Dispatch of preliminary report

(1) The preliminary report shall be sent by facsimile, e-mail or airmail within thirty days of the date of the accident unless the Accident and Incident Data Report has been sent by that time.

(2) Notwithstanding subregulation (1), where matters directly affecting safety are involved, the Preliminary Report shall be sent as soon as the information is available and by the most suitable and quickest means available.

PART VI— ACCIDENT AND INCIDENT DATA REPORTING

Responsibility of State Conducting Investigations

67. Accident of aircraft over 2,250 kilograms

Where the aircraft involved in an accident is of a maximum mass of over 2,250 kilograms, the State conducting investigations shall send, as soon as practicable, after the investigations, the Accident Data Report to the International Civil Aviation Organisation.

68. Additional information

The State conducting investigations shall, upon request, provide other States with pertinent information additional to the information made available in the Accident and Incident Data Report.

69. Incident of aircraft over 5,700 kilograms

Where a State investigates an incident to an aircraft of a maximum mass of over 5,700 kilograms, that State shall send, as soon as is practicable, after the investigations, the Incident Data Report to the International Civil Aviation Organisation.

PART VII—ACCIDENT PREVENTION MEASURES

70. Database and preventive actions

(1) European Co-ordination Center for Accident and Incident Reporting System shall be used as an accident and incident database to facilitate the effective analysis of information on actual or potential safety deficiencies and to determine any preventive actions required as specified in the applicable Technical Guidance Material.

(2) State authorities responsible for the implementation of the State Safety Programme shall have access to the accident and incident database referred to in subregulation(1), to support their safety responsibilities.

(3) In addition to safety recommendations arising from accident and incident investigations, safety recommendations may result from diverse sources, including safety studies.

(4) Where safety recommendations are addressed to an organisation in another State, they shall be transmitted to the accident investigations authority of that State.

PART VIII— REVOCATION AND SAVINGS

71. Revocation of S.I. No 13 of 2020 and savings

(1) The Civil Aviation (Investigations of Accidents) Regulations, 2020 are by revoked.

(2) An investigation, review or inquiry commenced under the Regulations revoked by subregulation (1) shall remain effective until its completion as if it was instituted under these Regulations.

SCHEDULES

SCHEDULE 1

Regulation 14(3)

GUIDLINES FOR THE DETERMINATION OF AIRCRAFT DAMAGE

1. Where an engine separates from an aircraft, the event is categorised as an accident even if the damage is confined to the engine.
2. A loss of engine cowls (fan or core) or reverser components which does not result in further damage to the aircraft is not considered as an accident.
3. An Occurrence where the compressor or turbine blades or other engine internal component is ejected through the engine tail pipe is not considered as an accident.
4. A collapsed or missing radome is not considered as an accident unless there is related substantial damage in the other structures or systems of the aircraft.
5. An Occurrence of missing flaps, slats or other lift augmenting devices, winglets, etc, that is permitted for dispatch under the Configuration Deviation List (CDL) is not considered as an accident.
6. The retraction of a landing gear leg or wheels-up landing, resulting in skin abrasion only, where the aircraft can be safely dispatched after minor repairs or patching, and the aircraft subsequently undergoes more extensive work to effect a permanent repair, is not considered as an accident.
7. Where the structural damage is such that the aircraft depressurizes, or cannot be pressurised, the Occurrence is categorised as an accident.
8. The removal of components of an aircraft for inspection following an, incident or accident including the precautionary removal of an undercarriage leg following a low-speed runway excursion, while involving considerable work, is not considered as an accident except where significant damage to the aircraft is identified.
9. An Occurrence that involves an emergency evacuation is not considered as an accident unless a person receives serious injuries or the aircraft has sustained significant damage.

10. Regarding aircraft damage which adversely affects the structural strength, performance or flight characteristics, the aircraft may have landed safely, but cannot be safely dispatched on a further sector without repair.
11. Where the aircraft can be safely dispatched after minor repairs and subsequently undergoes more extensive work to effect a permanent repair, then the Occurrence is not considered as an accident.
12. Without prejudice to the provisions in paragraph 11, where the aircraft can be dispatched under the Configuration Deviation List with the affected component removed, missing or inoperative, the Occurrence is not considered as an accident and any repair of the affected component is not considered as a major repair.
13. The cost of repairs, or estimated loss, as provided by an insurance company may provide an indication of the damage sustained but shall not be used as the sole guide to determine whether the damage is sufficient to render consideration of the Occurrence as an accident.
14. Without prejudice to the provisions in paragraph 13, an aircraft may be considered a “hull loss” where the aircraft is considered uneconomic to repair, without the aircraft having incurred sufficient damage to be classified as an accident.

SCHEDULE 2

Regulation 22 (3)

NOTIFICATION AND REPORTING CHECKLIST

1. Introduction

1.1 In this checklist, the following terms have the meaning stated below—

- (a) International Occurrences means accidents and serious incidents occurring in the territory of a Contracting State to aircraft registered in another Contracting State;
- (b) Domestic Occurrences means accidents and serious incidents occurring in the territory of the State of Registry; and
- (c) Other Occurrences means accidents and serious incidents occurring in the territory of a Non-Contracting State, or outside the territory of any State.

2. Notification — Accidents and Serious Incidents

| <i>From</i> | <i>For</i> | <i>Send to</i> | <i>Regulation</i> |
|---------------------|---------------------------------|--|-------------------|
| | | | <i>reference</i> |
| State of Occurrence | International Occurrences: | State of Registry | 21. |
| | All aircraft | State of the Operator | |
| | | State of Design | |
| | | State of Manufacture | |
| | | ICAO (when aircraft over 2,250 kg or is a turbojet-powered aeroplane) | |
| State of Registry | Domestic and other Occurrences: | State of the Operator | 9 |

| | | | |
|--|--------------|---|--|
| | All aircraft | State of Design | |
| | | State of Manufacture | |
| | | ICAO (when aircraft over 2 250 kg or is a turbojet-powered aeroplane) | |

3. Final report

6.1.1 Accident and incident wherever they occurred

| <i>From</i> | <i>Type of report</i> | <i>Concerning</i> | <i>Send to</i> | <i>Regulation</i> |
|-------------------------------------|-----------------------|------------------------|--|-------------------|
| | | | | <i>reference</i> |
| State conducting the investigations | Final report | All aircraft | State instituting the investigations | 55 |
| | | | State of Registry | |
| | | | State of the Operator | |
| | | | State of Design | |
| | | | State of Manufacture | |
| | | | Other States participating in the investigations | |
| | | | State having suffered fatalities or serious injuries to its citizens | |
| | | | State providing information, significant facilities or experts | |
| | | Aircraft over 5,700 kg | ICAO | 59 |
| | | | | |

4. ADREP REPORT

Accident and incident wherever they occurred

| <i>From</i> | <i>Type of report</i> | <i>Concerning</i> | <i>Send to</i> | <i>Regulation reference</i> |
|-------------------------------------|-----------------------|--|---|-----------------------------|
| State conducting the investigations | PRELIMINARY REPORT | Accidents to aircraft over 2,250 kg | State of Registry or State of Occurrence State of the Operator State of Design State of Manufacture State providing information, significant facilities or experts ICAO | 63 |
| | | Accidents to aircraft of 2,250 kg or less if Airworthiness or matters of Interest are involved | Same as above, except ICAO | 64 |
| | ACCIDENT DATA REPORT | Accidents to aircraft over 2,250 kg | ICAO | 67 |
| | INCIDENT DATA REPORT | Incidents to aircraft over 5,700 kg | ICAO | 69 |

5. ACCIDENT PREVENTION MEASURES Safety matters of interest to other States

| <i>From</i> | <i>Type</i> | <i>Concerning</i> | <i>Send to</i> | <i>Regulation reference</i> |
|--------------------------------------|------------------------|---------------------------------------|---|-----------------------------|
| States making safety recommendations | Safety recommendations | Recommendations made to another State | Accident investigations authority in that State | 60 |
| | | ICAO documents | ICAO | 57 |

SCHEDULE 3

Regulation 36 (1)

GUIDELINES FOR FLIGHT RECORDER READ-OUT AND ANALYSIS

1. Initial response
 - 1.1 The aftermath of a major accident is a demanding time for any State's accident investigations authority. One of the immediate items requiring a decision is where to have the flight recorders read out and analysed. It is essential that the flight recorders be read out as early as possible after an accident. Early identification of problem areas can affect the investigations at the accident site where evidence is sometimes transient. Early identification of problem areas may also result in urgent safety recommendations which may be necessary to prevent a similar Occurrence.
 - 1.2 Many States do not have their own facilities for the playback and analysis of flight recorder information (both voice and data) and consequently request assistance from other States. It is essential, therefore, that the accident investigations authority of the State conducting the investigations make timely arrangements to read out the flight recorders at a suitable read-out facility.
2. Choice of facility
 - 2.1 The State conducting the investigations may request assistance from any State that, in its opinion, can best serve the investigations. The manufacturer's standard replay equipment and playback software, which are typically used by airlines and maintenance facilities, are not considered adequate for investigations purposes. Special recovery and analysis techniques are usually required if the recorders have been damaged.
 - 2.2 Facilities for the read-out of flight recorders shall have the ability to—

- (a) disassemble and read out recorders that have sustained substantial damage;
- (b) play back the original recording or memory module without the need for the use of a manufacturer's copy device or the recorder housing that was involved in the accident or incident;
- (c) manually analyse the raw binary waveform from digital tape flight data recorders;
- (d) enhance and filter voice recordings digitally by means of suitable software; and
- (e) graphically analyses data, derive additional parameters not explicitly recorded, validate the data by cross-checking and use other analytical methods to determine data accuracy and limitations.

3. Participation by the State of Manufacture (or Design) and the State of the Operator

- 3.1 The State of Manufacture (or Design) has airworthiness responsibilities and the expertise normally required to read out and analyse flight recorder information. Since flight recorder information can often reveal airworthiness problems, the State of Manufacture (or Design) shall have a representative present when the flight recorder read-out and analysis are being conducted in a State other than the State of Manufacture (or Design).
- 3.2 The State of the Operator has regulatory responsibilities regarding the flight operation and can provide insights into operational issues which may be specific to the operator. Since flight recorder information can reveal operational problems, the State of the Operator shall also have a representative present when the flight recorder read-out and analysis are being conducted.

4. Recommended procedures

- 4.1 The flight data recorder and the cockpit voice recorder shall be read out by the same facility, because they contain complementary data which can help validate each recording and aid in determining timing and synchronisation.
- 4.2 Flight recorders shall not be opened or powered up and original recordings shall not be copied (particularly not by high-speed copy devices) prior to the read-out because of the risk of damage to the recordings.
- 4.3 The facility at which the flight recorders are read out for another State shall be given an opportunity to comment on the Final report in order to ensure that the characteristics of the flight recorder analysis have been taken into account.
- 4.4 The facility at which the flight recorders are read out may require the expertise of the aircraft manufacturer and the operator in order to verify the calibration data and validate the recorded information.
- 4.5 The State conducting the investigations may leave the original recordings, or a copy of them, with the read-out facility until the investigations is completed, in order to facilitate the timely resolution of additional requests or clarifications, providing that the facility has adequate security procedures to safeguard the recordings.

SCHEDULE 4

Regulation 42 (1) and (11)

GUIDELINES FOR THE PROTECTION OF ACCIDENT AND INCIDENT INVESTIGATIONS RECORDS

1. INTRODUCTION

- 1.1. The disclosure or use of records listed in regulation 42, in criminal, civil, administrative, or disciplinary proceedings, or the public disclosure thereof, can have adverse consequences for persons or organisations involved in accident and incident, likely causing them or others to be reluctant to cooperate with accident investigations authorities in the future. The determination on disclosure or use required by regulation 42 is designed to take account of these matters.
- 1.2. In accordance with regulation 42, the provisions specified in this Schedule are intended to—
 - (a) assist the State in developing national laws, regulations and policies to protect accident and incident investigations records appropriately; and
 - (b) assist the competent authority in making the determination as required by regulation 42.
- 1.3. Throughout this Schedule:
 - (a) balancing test refers to the determination by the competent authority, in accordance with regulation 42, of the impact the disclosure or use of accident and incident investigations records may have on current or future investigations; and
 - (b) record(s) refers to the items listed in regulation 40.
- 1.4. The provisions on the use and protection of safety information and related sources other than accident and incident investigations records are included in the Civil Aviation (Safety Management) Regulations, 2022.

2. GENERAL

- 2.1 The State shall accord protection referred to in regulation 42 and this Schedule to the entire recording of the cockpit voice recorder, airborne image recorder, and any transcripts from such recordings. These protection referred to in this paragraph shall apply from the time the accident or incident occurs and shall continue after the publication of the final report.
- 2.2 The State shall accord the protection referred to in regulation 42 and this Schedule to the other records listed in the regulation. The protection shall apply from the time the records come into the custody or control of the accident investigations authority and shall continue until the publication of the final report.
- 2.3 Non-disclosure of audio or image recordings to the public
 - 2.3.1 The State shall take action to achieve the non-disclosure of the audio content of cockpit voice recordings as well as the image and audio content of airborne image recordings to the public, as per regulation 42 including—
 - (a) the prevention of disclosure through the adoption of national laws, regulations and policies; or
 - (b) the adoption of authoritative safeguards such as protective orders, closed proceedings or in-camera review; or
 - (c) the prevention of disclosure of recordings through technical means, such as encrypting or overwriting, before returning the cockpit voice recorders or airborne image recorders to the owners.
 - 2.3.2 Ambient workplace recordings, such as cockpit voice recordings and airborne image recordings, required by the Regulations made under the Act may be perceived as constituting an invasion of the privacy of operational personnel if disclosed or used for purposes other than those for which the recordings were made.

3. **COMPETENT AUTHORITY**

- 3.1. In accordance with regulation 42, every State shall designate a competent authority or competent authorities appropriate to the task of administering the balancing test.
- 3.2. Different competent authorities may be designated for different circumstances. For example, the competent authority designated for applying the balancing test in criminal or civil proceedings may be a judicial authority. Another competent authority may be designated for applying the balancing test in cases where the purpose of the request for disclosure is for public accessibility.

4. **ADMINISTRATION OF THE BALANCING TEST**

- 4.1 Where the request is for a record to be disclosed or used in a criminal, civil, administrative or disciplinary proceeding, the competent authority shall be satisfied that a material fact in question in the proceedings cannot be determined without that record, before administering the balancing test.
- 4.2 A material fact in question is a legal term used to refer to a fact that is significant or essential to the matter at hand, that one party alleges and that the other controverts, and is to be determined by the competent authority administering the balancing test.
- 4.3 When administering the balancing test, the competent authority shall take into consideration factors such as—
 - (a) the purpose for which the record was created or generated;
 - (b) the requester's intended use of that record;
 - (c) whether the rights or interests of a person or organisation will be adversely affected by the disclosure or use of that record;
 - (d) whether the person or organisation to whom that record relates has consented to make that record available;
 - (e) whether suitable safeguards are in place to limit the further disclosure or use of that record;

- (f) whether that record has been or can be de-identified, summarised or aggregated;
- (g) whether there is an urgent need to access that record to prevent a serious risk to health or life;
- (h) whether that record is of a sensitive or restrictive nature; and
- (i) whether that record reasonably indicates that the accident or incident may have been caused by an act or omission considered, in accordance with national laws and regulations, to be gross negligence, willful misconduct, or done with criminal intent.

4.4 The administration of the balancing test can be done once for a certain category of records and the result incorporated into national laws and regulations.

4.5 The competent authority may need to administer a balancing test for determining whether to permit the disclosure of a record, and a separate balancing test for determining whether to permit the use of a record.

4.6 Guidance material on the balancing test can be found in the Manual on Protection of Safety Information-Protection of Accident and Incident Investigations Records.

5. **RECORDS OF THE DECISIONS**

5.1 The competent authority shall record the reasons for its determination when administering the balancing test. The reasons shall be made available and referred to as necessary for subsequent decisions.

5.2 The State may submit the decisions recorded to the International Civil Aviation Organisation in English languages of the Organisation to be archived in a public database.

6. **Final report**

- 6.1 In order to limit the use of the final report for purposes other than the prevention of accident and incident, the State shall consider—
- (a) instituting a separate investigations for those other purposes;
 - (b) differentiating between the parts of the final report in order to allow the use of factual information contained therein while preventing use of analysis, conclusions and safety recommendations for apportioning blame or liability; or
 - (c) preventing the use of the final report as evidence in proceedings to apportion blame or liability.
- 6.2 Final reports are publicly available in the interest of accident prevention and are not subject to protection regulation 42. However, the use of portions of the final report, in particular the analysis, conclusions and safety recommendations, as evidence before national courts in view of assigning blame or determining liability is prohibited.

7. **ACCIDENT AND INCIDENT INVESTIGATIONS PERSONNEL**

- 7.1 In the interest of safety and in accordance with regulation 4, States shall consider that accident investigations personnel not be compelled to give an opinion on matters of blame or liability in civil, criminal, administrative or disciplinary proceedings.

SCHEDULE 5

Regulation 55

FORMAT OF Final report

1. PURPOSE

- 1.1 The purpose of this format is to present the final report in a convenient and uniform manner.
- 1.2 Detailed guidance on completing each section of the final report is found in the Manual of Aircraft Accident and Incident Investigations.

2. FORMAT

2.1 Title.

The final report begins with a title comprising—

- (a) name of the operator;
- (b) manufacturer,
- (c) model,
- (d) nationality and registration marks of the aircraft; and
- (e) place and date of the accident or incident.

2.2 Synopsis.

Following the title is a synopsis describing briefly all relevant information regarding—

- (a) notification of accident to national and foreign authorities;
- (b) identification of the accident investigations authority and accredited representation;
- (c) organisation of the investigations;
- (d) authority releasing the report;
- (e) date of publication;

- (f) concluding with a brief résumé of the circumstances leading to the accident.

2.3 Body.

The body of the final report comprises the following main headings—

- (a) factual information;
- (b) analysis;
- (c) conclusions; and
- (d) safety recommendations.

2.3.1 Each heading consisting of a number of subheadings as outlined in the following.

2.4 Appendices. Include as appropriate.

2.5 In preparing a final report, using this format, ensure that—

- (a) all information relevant to an understanding of the factual information, analysis and conclusions is included under each appropriate heading;
- (b) where information in respect of any of the items in paragraph (a), factual information is not available, or is irrelevant to the circumstances leading to the accident, a note to this effect is included under the appropriate subheadings.

3. **FACTUAL INFORMATION**

3.1 History of the flight.

A brief narrative giving the following information—

- (a) flight number, type of operation, last point of departure, time of departure (local time or UTC), and point of intended landing;
- (b) flight preparation, description of the flight and events leading to the accident, including reconstruction of the significant portion of the flight path, if appropriate; and

- (c) location including latitude, longitude, elevation, time of the accident (local time or UTC), whether day or night.

3.2 *Injuries to persons.* Completion of the following (in numbers):

| <i>Injuries</i> | <i>Crew</i> | <i>Passengers</i> | <i>Others</i> |
|-----------------|-------------|-------------------|---------------|
| Fatal | | | |
| Serious | | | |
| Minor/None | | | |

Fatal injuries include all deaths determined to be a direct result of injuries sustained in the accident whereas serious injury is defined in Part 1.

- 3.3 Damage to aircraft: Brief statement of the damage sustained by aircraft in the accident, for instance destroyed, substantially damaged, slightly damaged, no damage.

- 3.4 Other damage: Brief description of damage sustained by objects other than the aircraft.

3.5 Personnel information:

- (a) Pertinent information concerning each of the flight crew members including: age, validity of licences, ratings, mandatory checks, flying experience including total and on type and relevant information on duty time.
- (b) Brief statement of qualifications and experience of other crew members.
- (c) Pertinent information regarding other personnel, such as air traffic services, maintenance, etc., when relevant.

3.6 Aircraft information:

- (a) Brief statement on airworthiness and maintenance of the aircraft such as indication of deficiencies known prior to and during the flight to be included, if having any bearing on the accident.

- (b) Brief statement on performance, if relevant, and whether the mass and center of gravity were within the prescribed limits during the phase of operation related to the accident. (If not and if of any bearing on the accident give details.)
- (c) Type of fuel used.

3.7 Meteorological information:

- (a) Brief statement on the meteorological conditions appropriate to the circumstances including both forecast and actual conditions, and the availability of meteorological information to the crew.
- (b) Natural light conditions at the time of the accident including sunlight, moonlight, twilight.

3.8 Aids to navigation. Pertinent information on navigation aids available, including landing aids such as ILS, MLS, NDB, PAR, VOR, visual ground aids, etc., and their effectiveness at the time.

3.9 Communications: Pertinent information on aeronautical mobile and fixed service communications and their effectiveness.

3.8 Aerodrome information: Pertinent information associated with the aerodrome, its facilities and condition, or with the take-off or landing area if other than an aerodrome.

3.10 Flight recorders: Location of the flight recorder installations in the aircraft, their condition on recovery and pertinent data available therefrom.

3.11 Wreckage and impact information: General information on the site of the accident and the distribution pattern of the wreckage, detected material failures or component malfunctions. Details concerning the location and state of the different pieces of the wreckage are not normally required unless it is necessary to indicate a break-up of the aircraft prior to impact. Diagrams, charts and photographs may be included in this section or attached in the appendices.

- 3.12 Medical and pathological information: Brief description of the results of the investigations undertaken and pertinent data available therefrom.
- 3.13 Medical information related to flight crew licences shall be included in 3.5— Personnel information.
- 3.14 Fire: If fire occurred, information on the nature of the Occurrence, and of the firefighting equipment used and its effectiveness.
- 3.15 Survival aspects: Brief description of search, evacuation and rescue, location of crew and passengers in relation to injuries sustained, and failure of structures such as seats and seat-belt attachments.
- 3.16 Tests and research: Brief statements regarding the results of tests and research.
- 3.17 Organisational and management information: Pertinent information concerning the organisations and their management involved in influencing the operation of the aircraft, the organisations include, for example: the operator; the air traffic services; airway, aerodrome and weather service agencies; and the regulatory authority. The information could include, but not be limited to, organisational structure and functions, resources, economic status, management policies and practices, and regulatory framework.
- 3.18 Additional information. Relevant information not already included in 3.1 to 3.17.
- 3.19 Useful or effective investigations techniques. When useful or effective investigations techniques have been used during the investigations, briefly indicate the reason for using these techniques and refer here to the main features as well as describing the results under the appropriate subheadings 1.1 to 3.18.

4. ANALYSIS

- 4.1 Analyse, as appropriate, only the information documented in 1. Factual information and which is relevant to the determination of conclusions and causes and/or contributing factors.

5. CONCLUSIONS

- 5.1 List the findings, causes or contributing factors established in the investigations. The list of causes or contributing factors shall include both the immediate and the deeper systemic causes or contributing factors.
- 5.2 The final report format presented in this Schedule may be adapted to the circumstances of the accident or incident. Thus, the State may use either “causes” or “contributing factors”, or both, in the Conclusions.

6. SAFETY RECOMMENDATIONS

- 6.1 As appropriate, briefly state any recommendations made for the purpose of accident prevention and identify safety actions already implemented.

7. APPENDICES

- 7.1 Include, as appropriate, any other pertinent information considered necessary for the understanding of the final report.

GEN. EDWARD KATUMBA-WAMALA (MP)
Minister of Works and Transport.

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 87

**THE CIVIL AVIATION (PARACHUTE OPERATIONS)
REGULATIONS, 2022**

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STATUTORY INSTRUMENTS

2022 No. 87

The Civil Aviation (Parachute Operations) Regulations, 2022.

(Under sections 34(2) and 61 of the Civil Aviation Authority Act, Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by sections 34(2) and 61 of the Civil Aviation Authority Act and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Parachute Operations) Regulations, 2022.

2. Application

These Regulations apply to—

- (a) parachute operations other than—
 - (i) emergency parachute descents;
 - (ii) parachute descents which are not from an aircraft;
- (b) parachute equipment; and
- (c) parachute maintenance.

(2) These Regulations shall not apply to a parachute operation conducted by the military.

3. Interpretation

In these Regulations unless the context otherwise requires—

- “Act” means the Civil Aviation Authority Act, Cap. 354;
- “altimeter” means a visually read instrument for measuring height throughout descent;
- “approved parachute” means a parachute manufactured under a type certificate or a technical standard order (C-23 series);
- “authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;
- “automatic activation device” means a self-contained mechanical or electro-mechanical device that is attached to the interior of the reserve parachute container, which automatically initiates parachute deployment of the reserve parachute at a pre-set altitude, time, percentage of terminal velocity or combination thereof;
- “currency point” has the value assigned to it in Schedule 1 to these Regulations;
- “drop zone” means any pre-determined area upon which parachutists or objects land after making an intentional parachute jump or drop;
- “freefall” means the portion of a parachute jump or drop between aircraft exit and parachute deployment in which the parachute is activated manually by the parachutist at the parachutist’s discretion or automatically, or in the case of an object, is activated automatically;
- “jumper” means an experienced parachute jumper who may make descents without the supervision of an instructor;
- “jump master” means an experienced jumper certified as capable of supervising students in aircraft and on static line and free fall jumps;

“main parachute” means a parachute worn as the primary parachute used or intended to be used in conjunction with a reserve parachute;

“object” means any item other than a person that descends to the surface from an aircraft in flight when a parachute is used or is intended to be used during all or part of the descent;

“parachute drop” means the descent of an object to the surface from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent;

“parachute jump” means a parachute operation that involves the descent of one or more persons to the surface from an aircraft in flight when an aircraft is used or intended to be used during all or part of that descent;

“parachute operation” means the performance of all activity for the purpose of or in support of a parachute jump or a parachute drop; this parachute operation can involve, but is not limited to, the following persons: parachutist, parachutist in command and passenger in tandem parachute operations, drop zone or owner or operator, jump master, certificated parachute rigger or Pilot-In-Command;

“parachute rigger” means a person who is authorised to pack, maintain or alter any parachute in conformity with manufacturer’s instructions;

“parachutist” means a person who intends to exit an aircraft while in flight using a single-harness, dual parachute system to descend to the surface;

“parachutist in command” means the person responsible for the operation and safety of a tandem parachute operation;

“passenger parachutist” means a person who boards an aircraft, acting as other than the parachutist in command of a tandem parachute operation, with the intent of exiting the aircraft while in-flight using the forward harness of a dual harness tandem parachute system to descend to the surface;

“pilot chute” means a small parachute used to initiate or accelerate deployment of a main or reserve parachute;

“ram-air parachute” means a parachute with a canopy consisting of an upper and lower surface that is inflated by ram air entering through specially designed openings in the front of the canopy to form a gliding airfoil;

“reserve parachute” means an approved parachute worn for emergency use to be activated only upon failure of the main parachute or in any other emergency where use of the main parachute is impractical or use of the main parachute would increase risk;

“single-harness, dual parachute system” means the combination of a main parachute, approved reserve parachute, and approved single person harness and dual-parachute container; this parachute system may have an operational automatic activation device installed;

“student jumper” means a parachute jumper who is only allowed to make descents under the supervision of an instructor;

“tandem master” means experienced jump master trained in tandem operation who is in control of the passenger and tandem parachute equipment;

“tandem parachute operation” means a parachute operation in which more than one person simultaneously uses the same tandem parachute system while descending to the surface from an aircraft in flight;

“tandem parachute system” means the combination of a main parachute, approved reserve parachute, approved harness, dual parachute container and a separate approved forward harness for a passenger parachutist; this parachute system must have an operational automatic activation device installed.

PART II—PARACHUTE PERSONNEL

Parachute jumping

4. Eligibility requirements

(1) A person who intends to become a parachute jumper shall apply to the authority for a parachute jumping authorisation.

(2) An applicant for a parachute jumping authorisation shall—

- (a) be at least eighteen years of age;
- (b) be able to read, speak and understand the English language;
- (c) demonstrate a level of knowledge appropriate to the privileges granted to a holder of a parachute jumping authorisation; and
- (d) comply with the provisions of these Regulations.

(3) An applicant for a tandem master authorisation shall in addition to the requirements of subregulation (1), hold a class 2 medical certificate.

5. Parachute jumping authorisation types

The authority may issue the following types of parachute jumping authorisation—

- (a) student jumper;
- (b) jumper;

- (c) jump master; and
- (d) tandem master.

6. Skill requirements

An applicant for—

- (a) a jumper authorisation shall have logged not less than 25 jumps and have demonstrated to the authority his or her competence in the following areas—
 - (i) parachute packing;
 - (ii) obtaining meteorological information;
 - (iii) spotting the drop location from the aircraft;
 - (iv) hand signal communication techniques and procedures; and
 - (v) pre-flight briefing and “dirt diving”;
- (b) a jump master authorisation shall have—
 - (i) successfully completed a jump master’s course;
 - (ii) made five hundred freefall jumps; and
 - (iii) satisfactorily completed a post course of jump mastering 10 students under supervision of an authorised instructor; and
- (c) a tandem master authorisation shall be an experienced jumper master, trained in tandem operation and is in control of the passenger and tandem parachute equipment.

General requirements

7. Conditions of authorisation

(1) A person shall not conduct a parachute operation, from an aircraft where that operation creates a hazard to air traffic or to a person or property on the surface.

(2) A Pilot-In-Command of an aircraft shall not allow a parachute operation to be conducted from an aircraft, where that operation creates a hazard to air traffic or to persons or property on the surface.

(3) A holder of a parachute jumping authorisation shall maintain a parachuting logbook of jumps.

(4) A jumper shall conduct a parachute operation at a location approved by the authority.

(5) A jumper or event organiser shall obtain permission from the air traffic control unit responsible for the area of the operation, prior to each descent.

(6) A jumper or event organiser shall obtain permission from the area control centre responsible for the area of the operation in locations with no air traffic control unit.

8. Descent requirements

(1) A jumper shall not make or attempt to make a parachute descent unless wearing two airworthy parachutes from exit to activation.

(2) A reserve parachute shall be inspected and packed by a parachute rigger not more than four months preceding each jump.

(3) The main parachute may be packed by either the jumper or a parachute rigger.

(4) The minimum altitude from which descents are to be made shall be such that the main canopy is duly opened at an altitude of not less than two thousand feet above ground level.

9. Aircraft used for parachute jumping

A parachute descent shall be made from an aircraft type that has been authorised by the authority.

10. Pilot-in-command experience and training requirements

(1) A Pilot-In-Command of an aircraft to be used for parachute jumping shall—

- (a) be a qualified pilot and have a minimum of two hundred hours of pilot in command time; and
- (b) demonstrate competence to the authority by performing at least one drop of parachute jumpers.

(2) The demonstration referred to in subregulation (1) (b) shall be conducted under supervision of an experienced parachuting pilot who shall be present in the aircraft, during the check flight, to ascertain the competence in the dropping operation.

11. Validity and renewal requirements

(1) A parachute jump master and tandem master authorisation shall be valid for a period of twelve months from the date of issue or renewal.

(2) A holder of a parachute jump master authorisation or tandem master authorisation may apply for renewal of the authorisation if the holder has jump mastered ten static line students and five free fall students within the six months preceding the date of application for renewal.

(3) A holder of a student jumper authorisation or jumper authorisation shall not require renewal.

12. Visiting foreign parachuting jumpers

(1) A person who holds a parachute jumping authorisation issued by another Contracting State and who wishes to engage in parachute jumping in Uganda shall apply to the authority for recognition and acceptance of his or her qualification.

(2) Where the authority recognises an authorisation tendered under subregulation (1), the holder shall be exempted from regulations 8 to 17 of these Regulations.

(3) A holder of an authorisation under this regulation shall not instruct students in parachute jumping or tandem operations.

Parachute Rigger

13. Application for parachute rigger authorisation

A person who wishes to obtain a parachute rigger authorisation shall—

- (a) apply to the authority in the prescribed form;
- (b) be at least eighteen years of age;
- (c) be able to read, speak, write and understand the English language;
- (d) present satisfactory evidence to the authority of having packed at least twenty parachutes of each type for which the applicant seeks authorisation in accordance with the manufacturer's instructions and under the supervision of an authorised parachute rigger holding an authorisation for that type or a person holding an appropriate military rating; and
- (e) provide the authority with evidence of having passed a knowledge and practical test, to the satisfaction of the authority by demonstrating the ability to pack and maintain one type of parachute for which he or she seeks authorisation.

14. Issue of parachute rigger authorisation

The authority shall issue a parachute rigger authorisation where the authority is satisfied that an applicant has satisfied the requirements for issue of the authorisation.

15. Restrictions and limitations of parachute rigger authorisation

(1) A person shall not pack, maintain or modify personnel-carrying parachute intended for emergency use in an aircraft registered in Uganda unless that person holds an appropriate authorisation issued under these Regulations.

(2) A person who does not hold a parachute rigger authorisation may pack the main parachute of a dual parachute pack that is to be used by him or her for intentional jumping.

(3) A person shall not pack, maintain or modify any main parachute of a dual parachute pack to be used by someone else for intentional jumping unless that person has an appropriate parachute rigger authorisation issued under these Regulations.

16. Authorisation requirements for former military parachute rigger

Notwithstanding regulation 13, the authority may issue parachute rigger authorisation to a former military parachute rigger if he or she passes a knowledge test on these Regulations and presents satisfactory documentary evidence that he or she was a parachute rigger within the preceding twelve months before the date of application.

17. Performance standards

A holder of a parachute rigger authorisation shall not—

- (a) pack, maintain or modify any parachute unless he or she is authorised for that type;
- (b) pack a parachute that is not safe for emergency use;
- (c) pack a parachute that has not been thoroughly dried and aired;
- (d) alter a parachute in a manner that is not specifically authorised by the authority or the manufacturer;
- (e) pack, maintain or modify a parachute in any manner that deviates from procedures approved by the authority or the manufacturer of the parachute; or
- (f) exercise the privileges of the authorisation,

unless he or she understands the current manufacturer's instructions for the operation involved and has performed duties under the authorisation for at least ninety days within the preceding twelve months or demonstrated to the authority the ability to perform those duties.

18. Records to be kept by parachute rigger

(1) A holder of a parachute rigger authorisation shall keep a record of the packing, maintenance and modifications of parachutes performed or supervised.

(2) An parachute rigger who packs a parachute shall enter on the parachute packing record attached to the parachute, the date and place of the packing, a notation of any defects found during the inspection, and shall sign the record with the name and authorisation number.

(3) The record under subregulation (1) shall contain, with respect to each parachute worked on, a statement of—

- (a) type and make;
- (b) serial number;
- (c) the name and address of the owner or user of the parachute;
- (d) the kind and extent of the work performed;
- (e) the date and the place where the work was performed;
and
- (f) the results of any drop tests made with it.

(4) A person who makes a record under subregulation (1) shall keep that record for at least two years after the date the record is made.

19. Privileges

A parachute rigger may—

- (a) pack, maintain or modify any type of parachute for which he or she is authorised; and
- (b) supervise other persons in packing, maintaining or modifying any type of parachute for which he or she is authorised.

20. Validity and renewal requirements

(1) A parachute rigger authorisation shall be valid for a period of twenty four months from the date of issue or renewal.

(2) A parachute rigger who applies for renewal of the authorisation shall submit a logbook proving that he or she has packed at least thirty six reserve parachutes within twelve months preceding the date of application for renewal.

PART III—PARACHUTE OPERATIONS CERTIFICATE

21. Certificate requirements

(1) A person shall not conduct parachute operations unless he or she—

- (a) holds a parachute operations certificate;
- (b) complies with the privileges and limitations of the authorisation;
- (c) complies with operational standards and procedures contained in the parachute operations manual approved by the authority; and
- (d) complies with the currency requirements determined by the authority.

(2) A person shall not conduct parachute operations unless he or she has a parachute operations manual approved by the authority.

(3) For purposes of these Regulations, “person” includes an association, organisation or club.

22. Application for parachute operations certificate

(1) An applicant for a parachute operations certificate shall complete and submit an application form prescribed by the authority which shall include the following information—

- (a) the name, address, and telephone number of the person requesting the authorisation or gives notice of the parachute operation;
- (b) the radius of the drop zone around the target expressed in nautical miles;
- (c) the location of the centre of the drop zone in relation to the nearest airport, town or city;
- (d) each altitude above mean sea level at which the aircraft will be operated when parachutists or objects exit the aircraft; and
- (e) the name of the air traffic control facility with jurisdiction of the airspace at the first intended exit altitude to be used for the parachute operation.

(2) The authority may issue a parachute operations certificate if an applicant meets the requirements of these Regulations.

23. Amendment of parachute operations certificate

- (1) A parachute operations certificate may be amended—
 - (a) on the authority’s own initiative, under applicable laws and Regulations; or
 - (b) upon application by the holder of the parachute operations certificate.

(2) A holder of a parachute operations certificate shall submit an application to amend an authorisation by completing a form prescribed by the authority.

(3) An applicant for an amendment under this regulation shall file the application to amend an authorisation before the date of the proposed commencement of that operation.

(4) The authority shall grant a request to amend a parachute operations certificate if it determines that it is in interest of flight safety or in public interest.

24. Validity of parachute operations certificate

(1) A parachute operations certificate shall be valid for twelve months unless—

- (a) a shorter period is specified by the authority;
- (b) the authority amends, suspends, revokes or otherwise terminates the certificate;
- (c) the holder of a parachute operations certificate surrenders it to the authority; or
- (d) the holder of a parachute operations certificate suspends operations.

(2) The holder of a parachute operations certificate that is suspended or revoked shall return it to the authority.

25. Parachute operations manual

(1) A holder of a parachute operations certificate shall issue to the parachute members and persons assigned parachute operational functions, an operations manual which shall contain at least the following—

- (a) introduction and common abbreviations;
- (b) basic safety requirements;
- (c) student training syllabus;
- (d) skills programme;
- (e) formation parachuting rules;
- (f) artistic events;
- (g) canopy formation;
- (h) camera persons;

- (i) tandem operations;
- (j) extra ordinary activities;
- (k) wing suits;
- (l) jump master certification course syllabus;
- (m) rigging rules;
- (n) drop zone and landing area operating procedures;
- (o) briefings for new jumpers; and
- (p) miscellaneous forms.

(2) The operations manual under this regulation shall be amended or revised as is necessary to ensure that the information is kept up to date, and all such amendments or revisions shall be issued to all personnel that are required to use the operations manual.

(3) A parachute operations certificate holder shall submit to the authority a copy of the parachute operations certificate entire operations manual for the time being in force or of such parts thereof as the authority may specify.

(4) A parachute operations certificate holder shall make amendments or additions to the operations manual as the authority may require for the purpose of ensuring the safety of parachute jumpers and parachute passengers carried, efficiency or regularity of air navigation.

26. Designation of safety and training personnel

A holder of a parachute operations certificate shall in writing, designate for each drop zone operation, a safety and training personnel, who shall be in-charge of all operations with the following minimum qualifications—

- (a) a qualified experienced jump master with a minimum of a thousand free fall jumps and at least two years experience in parachute operations; and

- (b) shall have successfully completed a training in safety and parachute operating procedures recognised by the authority.

PART IV—OPERATING RULES

27. Use of drugs or alcohol

(1) A person shall not engage in parachute jumping from an aircraft while under influence of alcohol or any other psychoactive substance, including narcotic drugs, marijuana, depressants, stimulant drugs or substances, which render him or her unable to exercise the certificate privileges safely and properly.

(2) A Pilot-In-Command of an aircraft shall not allow a person to engage in parachute jumping from an aircraft while under influence of alcohol or any other psychoactive substance, including narcotic drugs, marijuana, depressants, stimulant drugs or substances, which render him or her unable to exercise, certificate privileges safely and properly.

(3) A person who performs any function requiring the authority's approval under these Regulations may be tested for drug or alcohol usage.

(4) Where the authority requires to test a person referred to under this regulation, the blood alcohol concentration (BAC) shall not exceed 0.02%, which is 0.2 grams of alcohol per litre of blood whereas the breathe alcohol concentration (BrAC) shall not exceed ninety micrograms of alcohol per litre of breath.

(5) Where the authority or any person authorised by the authority wishes to test a person referred to in subregulation (3) for the percentage by weight of alcohol in the blood, or for the presence of narcotic drugs, marijuana, or depressant or stimulant drugs or substances in the body, and that person—

- (a) refuses to submit to the test; or

- (b) having submitted to the test, refuses to authorise the release of the test results,

the authority may suspend or revoke the certificate or authorisation issued by the authority.

(6) In determining whether to suspend or revoke the authorisation issued under these Regulations, the authority shall consider all the relevant factors, including—

- (a) whether the holder of the authorisation had knowledge of the drug or alcohol use;
- (b) whether the holder of the authorisation encouraged the person to refuse the drug or alcohol test;
- (c) whether the holder of the authorisation dismissed the person who failed or refused the drug tests; and
- (d) the position that the person held with the holder of the certificate.

28. Hazard

A person shall not make a parachute descent if the descent constitutes or is likely to constitute, a safety hazard to—

- (a) air traffic;
- (b) a person or property in the air or on the ground; or
- (c) the aircraft concerned or its occupants.

29. Exit from aircraft

A person shall not exit from an aircraft to make a parachute descent unless authorised to do so by—

- (a) the Pilot-In-Command; or
- (b) a person nominated by a pilot-in-command for that purpose.

30. Minimum parachute activation altitude

A person making a parachute descent shall activate the main parachute at a height of not more than two thousand five hundred feet above ground level, except for—

- (a) a student parachutist, who shall activate the main parachute at not less than three thousand feet above ground level; or
- (b) a tandem jump master carrying out a tandem parachute descent, who shall activate the main parachute at not less than five thousand feet above ground level.

31. Parachute drop zone

A parachute descent, except emergency and display parachute descents shall be made within a parachute drop zone designated by the parachute operations certificate holder and approved by the authority.

32. Parachute landing area

(1) A person making a parachute descent shall land on a parachute landing area designated by the parachute operations certificate holder and approved by the authority.

(2) Simultaneous parachute and aircraft movements may be conducted at aerodromes if the parachute landing area is located clear of—

- (a) any movement area in use;
- (b) the strip area of any runway in use;
- (c) a taxiway which is in use; and
- (d) the approach and take-off areas of any runway or heliport in use.

(3) A person shall not make a parachute descent into water unless—

- (a) the parachute landing area has a clearly defined perimeter; and
- (b) adequate arrangements have been made to retrieve all parachutists.

33. Ground signal

A person shall not make a parachute descent unless a ground signal, consisting of a white circle with an attached cone pointing into the wind is displayed or a sensitive and conspicuous calibrated windsock is used.

34. Controlled airspace

A person shall not make a parachute descent in a controlled airspace unless he or she—

- (a) obtains an air traffic control clearance; and
- (b) descends in accordance with that clearance.

35. Descents onto manned aerodromes

A person shall not make a parachute descent onto an aerodrome unless he or she—

- (a) has prior approval from the owner or operator of the aerodrome;
- (b) obtains clearance from the air traffic control unit at the aerodrome; and
- (c) lands within the parachute landing area.

36. Descents onto unmanned aerodromes

A person shall not make a parachute descent onto an unmanned aerodrome unless he or she—

- (a) has prior approval from the owner or operator of the aerodrome;
- (b) observes other aerodrome traffic operating within the parachute descent zone for the purpose of avoiding collision;

- (c) conforms with or avoids the pattern of traffic formed by other aircraft operating within the parachute descent zone at the aerodrome; and
- (d) lands within the parachute landing area.

37. Descents within restricted areas

A person shall not make a parachute descent within a restricted area unless he or she has prior approval of the controlling authority for that area.

38. Radio equipment and use requirements

(1) A person shall not control or conduct a parachute operation in or into controlled airspace, during flight unless—

- (a) the aircraft is equipped with a functioning two-way radio communication system appropriate to the air traffic control facilities being used; and
- (b) radio communications have been established between the aircraft and the air traffic control facility having jurisdiction over the affected airspace of the first intended exit altitude at least five minutes before the parachute operation begins.

(2) A Pilot-In-Command of an aircraft shall not allow a parachute operation to be conducted from that aircraft, in or into controlled airspace unless, during that flight—

- (a) the aircraft is equipped with a functioning two-way radio communication system appropriate to the air traffic control facilities being used; and
- (b) radio communications have been established between the aircraft and the air traffic control facility having jurisdiction over the affected airspace of the first intended exit altitude at least five minutes before the parachute operation begins.

(3) A Pilot-In-Command of an aircraft used for any parachute operation in or into controlled airspace shall, during each flight establish radio communications to receive information regarding air traffic activity in the vicinity of the parachute operation.

(4) The Pilot-In-Command of an aircraft used for any parachute operation in or into controlled airspace shall, during each flight—

- (a) continuously monitor the appropriate frequency of the aircraft's radio communications system from the time radio communications are established between the aircraft and air traffic control, until the Pilot-In-Command advises air traffic control that the parachute operation has ended for that flight; and
- (b) advise air traffic control when the last parachutist or object leaves the aircraft.

(5) A parachute operation shall be aborted if, prior to receipt of a required air traffic control authorisation, or during any parachute operation in or into controlled airspace, the required radio communications system is or becomes inoperative.

39. Visibility and clearance from cloud

(1) A person shall not make a parachute descent unless he or she remains clear of cloud.

(2) A person shall not make a parachute descent through cloud, in a controlled airspace, unless he or she has obtained an air traffic control clearance to do so.

40. Descents from higher altitudes

(1) A person shall not make a parachute descent from an unpressurised aircraft unless—

- (a) when between altitudes of 10,000 feet above mean sea level and 13,000 feet above mean sea level for longer than thirty minutes, uses supplementary oxygen until immediately prior to exiting the aircraft; or
- (b) when between altitudes of 13,000 feet above mean sea level and 20,000 feet above mean sea level, uses supplementary oxygen until immediately prior to exiting the aircraft.

(2) A person shall not make a parachute descent from a pressurised aircraft when between altitudes of thirteen thousand feet above mean sea level and twenty thousand feet above mean sea level unless he or she uses supplementary oxygen during the period from immediately before depressurisation to immediately before exiting the aircraft.

(3) A person shall not make a parachute descent from altitudes above thirteen thousand feet above mean sea level unless he or she has satisfactorily completed a training course for high altitude descents.

(4) A person shall not make a parachute descent from altitudes above twenty thousand feet above mean sea level unless he or she uses supplementary oxygen from immediately before depressurisation, or from immediately after disconnection from any aircraft mounted supplementary oxygen system, until descent below an altitude of thirteen thousand feet above mean sea level.

41. Parachute operations over or into congested area or open-air assembly of persons

(1) A person shall not conduct a parachute jumping operation, and a pilot-in-command of an aircraft shall not allow a parachute operation to be conducted from that aircraft, over or into a congested area of a city, town or settlement or an open-air assembly of persons unless approval for that parachute jumping operation has been issued by the authority under these Regulations.

(2) Notwithstanding subregulation (1), a parachutist may drift over a congested area or an open-air assembly of persons with a fully deployed and properly functioning parachute if the parachutist is at a sufficient altitude to avoid creating a hazard to persons or property on the surface, provided he or she is authorised by the authority.

(3) A parachutist who wishes to drift over a congested area or an open-air assembly of persons shall apply to the authority in the form and manner prescribed by the authority.

(4) An application under subregulation (3) shall contain the following information—

- (a) the date and time the parachute operation is to begin;
- (b) the radius of the drop zone around the target expressed in nautical miles; and
- (c) the location of the center of the drop zone in relation to—
 - (i) the name, address, and telephone number of the person who requests the authorisation or gives notice of the parachute operation;
 - (ii) the nearest VOR facility in terms of the VOR radial on which it is located and its distance in nautical miles from the VOR facility when that facility is thirty nautical miles or less from the drop zone target;
 - (iii) the nearest airport, town, or city depicted on the appropriate Coast and Geodetic Survey World Aeronautical Chart or Sectional Aeronautical Chart, when the nearest VOR facility is more than thirty nautical miles from the drop zone target;
 - (iv) each altitude above mean sea level at which the aircraft shall be operated when parachutists or objects exit the aircraft;
 - (v) the duration of the intended parachute operation;
 - (vi) the registration number of the aircraft to be used; and
 - (vii) the name of the air traffic control facility with jurisdiction of the airspace at the first intended exit altitude to be used for the parachute operation.

(3) A person requesting an authorisation under these Regulations shall promptly notify the air traffic control facility that has jurisdiction over the affected airspace of a cancellation or postponement of a proposed or scheduled parachute operation.

(4) A person authorised under this regulation shall present proof of the authorisation for inspection upon the request of the authority.

(5) A person authorised under this regulation shall ensure that the location of the center of the drop zone in relation to the authorisation, and each person named as a participant in the authorisation issued under this regulation complies with all the requirements contained in the authorisation.

42. Parachute operations between sunset and sunrise

(1) A person shall not conduct a parachute operation, and a Pilot-In-Command of an aircraft shall not allow a person to conduct a parachute operation from an aircraft between sunset and sunrise, unless the person or object descending from the aircraft displays a light that is visible from at least 3 statute miles.

(2) The light under subregulation (1) shall be displayed from the time the person or the object is under a properly functioning open parachute until the person or object reaches the surface.

43. Parachute operations over or onto airports

(1) A person shall not conduct a parachute operation, and a Pilot-In-Command of an aircraft shall not allow a parachute operation to be conducted from that aircraft, over or onto an aerodrome unless, where the aerodrome has an operating control tower—

- (a) prior approval has been obtained from the management of the aerodrome to conduct parachute operations over or on that aerodrome;

- (b) approval has been obtained from the air traffic control tower to conduct a parachute operation over or onto that aerodrome; and
- (c) two-way radio communications are maintained between the Pilot-In-Command of the aircraft involved in the parachute operation and the control tower of the airport over or onto which the parachute operation is being conducted.

(2) A person shall not conduct parachute operations over or on an aerodrome without an operating air traffic control tower, unless prior approval has been obtained from the management of the aerodrome.

(3) A parachutist may drift over an airport with a fully deployed and properly functioning parachute where the parachutist is at least twenty thousand feet above that airport's traffic pattern, and avoids creating a hazard to air traffic or to persons and property on the ground.

44. Parachute operations in designated airspace

(1) A person shall not conduct a parachute operation, and a Pilot-In-Command of an aircraft shall not allow a parachute operation to be conducted from an aircraft—

- (a) over or within a restricted area or prohibited area unless the controlling authority of the area concerned has authorised that parachute operation;
- (b) within or into a Class A, B, C, D airspace area without, or in violation of the requirements of an air traffic control authorisation issued under this regulation; or
- (c) within or into Class E or G airspace area unless the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude is notified of the parachute operation no earlier than twenty four hours before or no later than 1 hour before the parachute operation begins.

(2) A request for a parachute operation authorisation or notification required under this regulation shall be submitted to the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude and shall include the information prescribed in regulation 41(4).

(3) For the purposes of subregulation (1) (c), an air traffic control facility may accept a written notification from an organisation that conducts parachute operations and lists the scheduled series of parachute operations to be conducted over a stated period of time not longer than twelve calendar months.

(4) Subject to subregulation (3), the notification shall—

(a) contain the information prescribed in regulation 41(4);

(b) identify the responsible persons associated with the parachute operation; and

(c) be submitted at least fifteen days, but not more than thirty days, before the parachute operation begins.

(5) The authority may revoke the acceptance of the notification for failure of the organisation conducting the parachute operations to comply with the requirements of the notification.

PART V—PARACHUTE EQUIPMENT AND FACILITIES

45. Parachutes

(1) A person or tandem pair shall not make a parachute descent unless equipped with a main parachute that complies with the technical standards order of the parachute manufacturer.

(2) A person or tandem pair shall not make a parachute descent unless equipped with a reserve parachute assembly which—

(a) complies with the technical standards of a parachute organisation; and

- (b) has been inspected, re-packed and certified as airworthy within the previous six months, by a parachute rigger, in accordance with the technical standards of a parachute organisation.

(3) A tandem rider shall not make a parachute descent unless he or she wears a harness which—

- (a) complies with the technical standards of a parachute organisation; and
- (b) is properly secured to a matching tandem master harness.

46. Altimeter

A person or tandem pair shall not make a free-fall descent of more than 10 seconds unless—

- (a) he or she is equipped with, and uses, a serviceable altimeter of a type suitable for parachuting; and
- (b) prior to take-off, zero the altimeter to the parachute landing area height.

47. Automatic activation devices

A person or tandem pair shall not make a parachute descent unless equipped with an automatic activation device on the reserve parachute, that has been—

- (a) certified as compatible with the reserve parachute assembly on the parachute assembly packing- record by a parachute rigger authorised by the parachute organisation or institution designated by the authority;
- (b) calibrated in accordance with the manufacturer's operating instructions;
- (c) set to operate the reserve parachute at a minimum height above the parachute landing area—

- (i) for an individual parachute descent, one thousand feet above ground level or such lower altitude as predetermined and set within the automatic activation device by the manufacturer of the device for the category of use; and
- (ii) for a tandem parachute descent, two thousand feet above ground level or such lower altitude as predetermined and set within the automatic activation device by the manufacturer of the device for use on tandem descents;
- (d) inspected by the parachute rigger in accordance with the manufacturer's instructions; and
- (e) check-calibrated within the previous six months.

48. Safety equipment

(1) A person shall not make a parachute descent into water unless he or she wears suitable floatation equipment capable of supporting his or her head clear of the water.

(2) A student parachutist shall not make a parachute descent within one nautical mile of a water hazard unless he or she wears a suitable floatation equipment capable of supporting that person's head clear of the water.

(3) A student parachutist shall not make a parachute descent unless he or she wears a serviceable, rigid, protective helmet of a type approved by the parachute organisation.

(4) A tandem pair shall not make a parachute descent unless equipped with protective head gear approved by the parachute organisation.

49. Use of single-harness, dual-parachute systems

(1) A person shall not conduct a parachute operation using a single-harness or a dual-parachute system, and Pilot-In-Command of an aircraft shall not allow a person to conduct a parachute operation from that aircraft using a single-harness, dual-parachute system, unless that system has at least one main parachute, one approved reserve parachute, and one approved single person harness and container that are packed as follows—

- (a) the main parachute was packed within one hundred and eighty days before the date of its use by a certified parachute rigger, the person making the next jump with that parachute, or a non-certified person under the direct supervision of a certified parachute rigger; and
- (b) the reserve parachute shall have been packed by a certified parachute rigger—
 - (i) within one hundred eighty days before the date of its use, where its canopy, shroud, and harness are composed exclusively of nylon, rayon, or similar synthetic fiber or material that is substantially resistant to damage from mold, mildew, other fungi, and other rotting agents propagated in a moist environment; or
 - (ii) within sixty days before the date of its use, where it is composed of any amount of silk, pongee, or other natural fiber, or material not specified in subparagraph (i).

(2) Where installed, the automatic activation device shall be maintained in accordance with manufacturer instructions for that automatic activation device.

50. Use of tandem parachute systems

(1) A person shall not conduct a parachute operation using a tandem parachute system, and a Pilot-In-Command of an aircraft shall

not allow a person to conduct a parachute operation from that aircraft using a tandem parachute system, unless one of the parachutists using the tandem parachute system is the parachutist in command, with a minimum of three years the experience in parachuting and shall provide documentation that he or she—

- (a) has completed a minimum of five hundred freefall parachute jumps using a ram-air parachute;
- (b) holds a tandem master authorisation issued by an organisation recognised by the authority;
- (c) has successfully completed a tandem instructor course given by the manufacturer of the tandem parachute system to be used in the parachute operation or a course acceptable to the authority; and
- (d) has been certified by the manufacturer or tandem course provider as properly trained on the use of the specific tandem parachute system to be used.

(2) The parachutist in command shall—

- (a) brief the passenger parachutist before boarding the aircraft on the procedures to be used—
 - (i) in case of an emergency with the aircraft or after exiting the aircraft;
 - (ii) while preparing to exit and exiting the aircraft;
 - (iii) during freefall;
 - (iv) while operating the parachute after freefall; and
 - (v) during landing approach, and landing; and
- (b) use the harness position prescribed by the manufacturer of the tandem parachute equipment.

(3) A person shall not make a parachute jump with a tandem parachute system unless—

- (a) the main parachute has been packed by a certified parachute rigger, the parachutist in command making the next jump with that parachute, or a person under the direct supervision of a certified parachute rigger;
- (b) the reserve parachute has been packed by a certified parachute rigger in accordance with regulation 49;
- (c) the tandem parachute system contains an operational automatic activation device for the reserve parachute, approved by the manufacturer of that tandem parachute system and the device shall—
 - (i) have been maintained in accordance with manufacturer instructions; and
 - (ii) be armed during each tandem parachute operation;
- (d) the passenger parachutist is provided with a manual main parachute activation device and is instructed on the use of that device, if required by the owner or operator;
- (e) the main parachute is equipped with a single-point release system; and
- (f) the reserve parachute meets Technical Standard Order C23 specifications.

51. Use of static lines

(1) A person shall not conduct a parachute operation using a static line attached to an aircraft and the main parachute unless an assist device, is used to aid the pilot chute in performing its function, or if no pilot chute is used, to aid in the direct deployment of the main parachute canopy.

(2) The assist device under subregulation (1) shall—

- (a) be long enough to allow the main parachute container to open before a load is placed on the device;
- (b) have a static load strength of—
 - (i) at least twenty eight pounds but not more than one hundred sixty pounds if it is used to aid the pilot chute in performing its function; or
 - (ii) at least fifty six pounds but not more than three hundred twenty pounds if it is used to aid in the direct deployment of the main parachute canopy; and
- (c) be attached as follows—
 - (i) at one end, to the static line above the static-line pins or, where static-line pins are not used, above the static-line ties to the parachute cone; and
 - (ii) at the other end, to the pilot chute apex, bridle cord, or bridle loop, or, if no pilot chute is used, to the main parachute canopy.

(3) A person shall not attach an assist device to a main parachute unless he or she is a certified parachute rigger or he or she makes the next parachute jump with that parachute.

(4) An assist device shall not be required for a parachute operation using a direct-deployed ram-air parachutes.

52. Foreign parachutists and equipment

(1) A person shall not conduct a parachute operation, and a Pilot-In-Command of an aircraft shall not allow a parachute operation to be conducted from that aircraft with an unapproved foreign parachute system unless—

- (a) the parachute system is worn by a foreign parachutist who is the owner of that system;

- (b) the parachute system is of a single-harness dual parachute type; and
- (c) the parachute system meets the civil aviation requirements of the foreign parachutist's country.

(2) A foreign non-approved parachute deployed by a foreign parachutist during a parachute operation conducted under this section shall be packed as follows—

- (a) the main parachute shall be packed by the foreign parachutist making the next parachute jump with that parachute, a certified parachute rigger, or any other person acceptable to the authority; and
- (b) the reserve parachute shall be packed in accordance with the foreign parachutist's civil aviation authority requirements, by a certified parachute rigger, or any other person acceptable to the authority.

PART VI—PARACHUTE MAINTENANCE

53. Facilities and equipment requirements

A holder of a parachute rigger authorisation shall not exercise the privileges of the authorisation unless he or she has at least the following facilities and equipment available—

- (a) a smooth surface;
- (b) suitable housing that is adequately lighted and ventilated for drying and airing parachutes;
- (c) enough packing tools and other equipment to pack and maintain the types of parachutes serviced; and
- (d) adequate housing facilities to perform applicable duties and to protect tools and equipment.

54. Airworthiness and safety directives

A person who intends to use a parachute for jumping shall ensure that the parachute complies with—

- (a) the applicable airworthiness directives issued by the authority;
- (b) the applicable safety directives issued by the parachute operations certificate holder; and
- (c) the mandatory modifications or instructions issued by the manufacturer.

55. Parachute serviceability

(1) A person who finds a parachute assembly to be unserviceable or not airworthy shall have the assembly—

- (a) re-inspected and returned to a serviceable and airworthy condition; or
- (b) withdrawn from service.

(2) A person shall not return to service a parachute assembly that has been marked as unserviceable until it has been re-inspected and returned to a serviceable and airworthy condition before use.

56. Modification and repair

A person shall not use a parachute, harness or container system that has been modified or repaired, in a manner that may affect the airworthiness of the parachute assembly, unless it is re-inspected and re-assessed by a parachute rigger in accordance with the technical standards order of the manufacturer.

57. Parachute assembly check

(1) A person shall not make a parachute descent unless he or she has checked the state of serviceability of the parachute assembly by—

- (a) reference to the assembly packing record for the parachute assembly;

- (b) a comprehensive external check;
- (c) checking that all the equipment is properly set to operate;
- (d) ensuring that no item being carried will interfere with the proper functioning of the parachute assembly; and
- (e) ensuring that the seal is not broken or tampered with.

(2) For a student parachutist, the person authorised by the parachute organisation to directly supervise the descent of the student parachutist shall inspect the equipment worn by the student parachutist to ensure that it is in accordance with subregulation (1).

(3) For a tandem rider, the tandem master shall inspect the equipment being worn by the tandem passenger in accordance with subregulation (1).

58. Seal

(1) An authorised parachute rigger shall have a seal with an identifying mark and a seal press prescribed by the authority.

(2) The parachute rigger shall seal the pack with a seal under subregulation (1) after packing a parachute in accordance with the manufacturer's recommendation for that type of parachute.

59. Parachute records

(1) An owner of a parachute assembly shall maintain a permanent record, which shall be kept in the assembly at all times, in—

- (a) a logbook; or
- (b) a separable log page, approved by the holder of a parachute operations certificate.

(2) The owner of a parachute assembly shall make the record available for inspection where required by an authorised officer, inspector or authorised person.

60. Access for inspection

A holder of a parachute operations certificate shall for the purpose of inspection to determine compliance with applicable regulations and requirements—

- (a) grant the authority unrestricted access to any of its organisations, facilities and aircraft; and
- (b) ensure that the authority is granted unrestricted access to any organisation or facilities that it has contracted for services associated with parachute operations and maintenance.

PART VII—MISCELLANEOUS

61. Possession of certificate, authorisation or other documents

A holder of a certificate an authorisation or other document issued by the authority under these Regulations shall have it in his or her physical possession or at the work site when exercising the privileges of that certificate, an authorisation or other document.

62. Inspection of licences and certificates

A person who holds a licence, certificate, an authorisation or other document required by these Regulations shall present it for inspection upon request by the authority or a person authorised by the authority.

63. Change of name

(1) A holder of a certificate, an authorisation or other document issued under these Regulations may apply to change the name on the certificate, an authorisation or other document issued under these Regulations.

(2) An application under this regulation shall be accompanied by—

- (a) the certificate, an authorisation or other document to be amended; and
- (b) a court order or other legal document verifying the change of name.

(3) The authority may make a change to a certificate, an authorisation or other document under this regulation and issue a replacement of the certificate, authorisation or other document issued under these Regulations.

(4) The authority shall return to the holder of a certificate, an authorisation or other document the original copy of the certificate, authorisation or other document issued under these Regulations.

(5) The authority shall retain copies of the certificate, authorisation or other document issued under these Regulations and return the replaced certificate, authorisation or other document with the appropriate endorsement.

(6) A holder of a certificate, an authorisation or other document issued under these Regulations, shall not transfer the certificate, authorisation or other document to another person, without the authorisation of the authority.

64. Change of address

(1) A holder of a certificate, an authorisation or other document issued under these Regulations shall notify the authority of a change of the physical and mailing address in the case of—

- (a) physical address, within at least fourteen days in advance of the change; or
- (b) mailing address, upon the change.

(2) A person who fails to notify the authority of the change in the physical address within the time frame specified in subregulation (1) shall not exercise the privileges of the certificate, an authorisation or other document.

65. Replacement of documents

A person may apply to the authority in the prescribed form for replacement of a certificate, an authorisation or other document issued under these Regulations where the document is lost or destroyed.

66. Suspension, variation or revocation of certificate, authorisation or other documents

(1) The authority may, where it considers it to be in public interest, suspend provisionally, a certificate, an authorisation or other document issued or granted under these Regulations pending investigation.

(2) The authority may, upon the completion of an investigation which has shown sufficient ground to its satisfaction and where it considers it to be in public interest, vary, suspend or revoke, a certificate, an authorisation or other document issued or granted under these Regulations.

(3) The authority may, where it considers it to be in public interest, prevent any person from parachuting.

(4) A holder or a person having the possession or custody of a certificate, an authorisation or other document which has been revoked, suspended or varied under these Regulations shall surrender it to the authority within fourteen days from the date of revocation, suspension or variation.

(5) A breach of a condition subject to which a certificate, an authorisation or other document is granted or issued under these Regulations shall render the certificate, authorisation or other document invalid during the continuance of the breach.

67. Use and retention of certificate, authorisation, other document or record

(1) A person shall not—

(a) use a certificate, authorisation, other document or record issued under these Regulations which has been forged, altered, suspended, revoked or to which he or she is not entitled;

- (b) forge or alter a certificate, authorisation, other document or record issued under these Regulations;
- (c) lend a certificate, an authorisation, other document or record under these Regulations to another person; or
- (d) make any false representation for the purpose of procuring himself, herself or another person the issue, renewal or variation of a certificate, an authorisation or other document or record.

(2) A person shall not—

- (a) mutilate, alter, render illegible or destroy;
- (b) knowingly make, procure or assist in making, a false entry; or
- (c) willfully omit to make a material entry on, a record required under these Regulations.

(3) A record required to be maintained under these Regulations shall be in a permanent and indelible material.

(4) A person shall not issue a certificate, an authorisation, other document or record under these Regulations, unless he or she is satisfied that all statements in the certificate, authorisation, other documentation or record is correct and the applicant is qualified to hold that certificate, authorisation, other document or record.

(5) A person shall not issue a certificate, an authorisation, other documentation or record under these Regulations without authorisation from the authority.

68. Report of contravention

(1) A person with knowledge of a contravention of the Act, these Regulations or an order made under the Act, shall report it to the authority.

(2) The authority shall determine the nature and type of any additional investigation or enforcement action that may need to be taken.

69. Enforcement of directives

A person who fails to comply with any directive given by the authority or by a person authorised by the authority, under any provision of these Regulations shall be deemed for the purposes of these Regulations to have contravened that provision.

70. Aeronautical user fees

(1) The authority may prescribe fees for—

- (a) the issue, renewal, extension or variation of a certificate or authorisation or other document;
- (b) the issue of a copy of a certificate or authorisation or other document;
- (c) the examination, test, inspection or investigation; or
- (d) the notices or proclamations, required under these Regulations.

(2) An application under these Regulations for which a fee is prescribed shall be accompanied by proof of payment of the prescribed fee.

(3) A fee prescribed under these Regulations, shall be non-refundable.

71. Application for exemptions

(1) A person or operator may apply to the authority for an exemption from any provision of these Regulations.

(2) A request for exemption shall be made in accordance with the requirements of these Regulations and shall be submitted and

processed in a manner prescribed in the applicable technical guidance material.

72. Exemption

(1) The authority may, upon consideration of the circumstances of the application for exemption, issue an exemption providing relief from the specified provisions of these Regulations, provided that—

- (a) the authority finds that the circumstances presented warrant the exemption; and
- (b) a level of safety shall be maintained equal to that provided by the Regulations from which the exemption is sought.

(2) The exemption under subregulation (1) may be terminated or amended at any time, by the authority.

(3) A person who receives an exemption shall notify the management and appropriate personnel performing the functions subject to the exemption.

73. Contravention of Regulations

A person who contravenes any provision of these Regulations may have his or her certificate, authorisation or other document revoked or suspended.

74. Offences and penalties

(1) Where any provision of these Regulations, orders, notices or proclamations is contravened in relation to an aircraft, the operator of that aircraft and the pilot-in-command, if the operator or the Pilot-In-Command is not the person who contravened that provision, shall, without prejudice to the liability of any other person under these Regulations, be deemed to have contravened that provision, unless he or she proves that the contravention occurred without his or her consent or connivance and that all due diligence was exercised to prevent the contravention.

(2) A person who contravenes any provision specified as an “A” provision in Schedule 2 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points for each offence or each flight or to imprisonment for a term not exceeding two years, or both.

(3) A person who contravenes any provision specified as a “B” provision in Schedule 2 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding a hundred currency points for each offence or each flight or to imprisonment for a term not exceeding four years, or both.

(4) A person who contravenes any provision of these Regulations not being a provision referred to in Schedule 2 to these Regulations, commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points, and in the case of a second or subsequent conviction for the like offence to a fine not exceeding four hundred currency points.

PART VIII—REVOCATION AND SAVINGS

75. Revocation of S.I. No. 59 of 2006, savings and transitional

(1) The Civil Aviation (Parachute Operations) Regulations, 2006 are revoked.

(2) A licence, certificate, authorisation, exemption or other approval granted by the authority under the Regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, exemption or other approval under subregulation (2), a person who, at the commencement of these Regulations is carrying

out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Notwithstanding regulation 73, a person granted a licence, certificate, authorisation, exemption or other approval, continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the licence, certificate, authorisation, exemption cancelled by the authority.

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Regulation 3

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OFFENCES AND PENALTIES

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GEN. EDWARD KATUMBA – WAMALA (MP)
Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 77

**THE CIVIL AVIATION (AIRWORTHINESS OF AIRCRAFT)
REGULATIONS, 2022**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 77

The Civil Aviation (Airworthiness of Aircraft) Regulations, 2022

(Under sections 34(2) and 61 of the Civil Aviation Authority Act, Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by sections 34(2) and 61 of the Civil Aviation Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

2. Application of Regulations

(1) These Regulations apply to all persons operating or maintaining—

- (a) a Ugandan registered aircraft, wherever operated;
- (b) an aircraft registered in another Contracting State operated by a person licensed in Uganda, and shall be maintained in accordance with the regulations of the aircraft State of Registry, wherever that maintenance is performed; and
- (c) aircraft of other Contracting States operating in Uganda.

(2) Except where the context otherwise requires, these Regulations shall in so far as the Regulations prohibit, require or regulate the doing of anything by any person in or by any of the crew of an aircraft registered in Uganda, apply to those persons and crew, wherever they may be.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“acceptable” means that the authority has reviewed the method, procedure or policy and has neither objected to nor approved its proposed use or implementation;

“aerial work” means an aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement;

“aeronautical product” means any aircraft, aircraft engine, propeller or sub assembly, appliance, material, part or component to be installed;

“aeroplane” means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight;

“aircraft” means any machine that derives support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface;

“aircraft component” means any part of an aircraft and includes a complete engine or any operational or emergency equipment;

“aircraft type” means all aircraft of the same basic design;

“airframe” means the fuselage, booms, nacelles, cowlings, fairings, airfoil surfaces, including rotors but excluding propellers and rotating airfoils of an engine, and landing gear of an aircraft and their accessories and controls;

“airworthy” means the status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation;

“appliance” means any instrument, mechanism, equipment, part, apparatus, appurtenance, or accessory, including communications equipment, that is used or intended to be used in operating or controlling an aircraft in flight, is installed in or attached to the aircraft, and is not part of an airframe, engine or propeller;

“appropriate airworthiness requirements” means the comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration;

“approved” means accepted by a contracting State as suitable for a particular purpose;

“approved by the authority” means approved by the authority directly or in accordance with a procedure approved by the authority;

“approved data” means technical information approved by the authority;

“approved maintenance organisation” means an organisation approved to perform specific aircraft maintenance activities by the authority;

“article” means any item, and includes an aircraft, airframe, aircraft engine, propeller, appliance, accessory, assembly, subassembly, system, subsystem, component, unit, product, or a part;

“authority” means the Uganda Civil Aviation Authority established by section 3 of the Act;

- “auxiliary power-unit” means a self-contained power-unit on an aircraft providing electrical or pneumatic power to aircraft systems during ground operations;
- “balloon” means a non-powered- driven lighter-than-air aircraft;
- “calendar day” means the period of time from midnight to the next midnight;
- “certificate of release to service” means a document that contains a certification that inspection and maintenance work has been performed satisfactorily in accordance with the methods prescribed by the authority;
- “continuing airworthiness” means the set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life;
- “control system” means a control system is an aircraft system by which the flight path, attitude, or propulsive force of the aircraft is changed, including the flight, engine and propeller controls, the related system controls and the associated operating mechanisms;
- “contracting State” means a member state of the International Civil Aviation Organisation (ICAO);
- “currency point” has the value assigned to it in Schedule 1;
- “date of manufacture or construction” means the date of issue of the document attesting that the individual aircraft or engine as appropriate conforms to the requirements of the type or the date of an analogous document;
- “duplicate inspection” means an inspection first made by an authorised person signing the maintenance release who assumes full responsibility for the satisfactory completion

of the work, before being subsequently inspected by a second independent competent person who attests to the satisfactory completion of the work recorded and that no deficiencies have been found;

“engine” means a unit used or intended to be used for aircraft propulsion, in consisting of at least those components and equipment necessary for functioning and control, but excludes the propeller, if applicable;

“heavier-than-air aircraft” means any aircraft deriving its lift in flight chiefly from aerodynamic forces;

“helicopter” means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

“ICAO” means the International Civil Aviation Organisation;

“LAME” means a Licensed Aircraft Maintenance Engineer;

“maintenance” means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing Airworthiness of an aircraft engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“maintenance control manual” means a document which describes the operator’s procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator’s aircraft on time and in a controlled and satisfactory manner;

“maintenance records” means records that set out the details of the maintenance carried out on an aircraft, engine, propeller or associated part;

“maintenance release” means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements;

“major modification” means a type design change which is not listed in the aircraft, aircraft engine, or propeller specifications and which may significantly affect the mass and balance limits, structural strength, performance, power plant operation, flight characteristics, or the other qualities that affect airworthiness or environmental characteristics, or that will be embodied in the product according to non-standard practices;

“major repair” means a repair of an aeronautical product that may significantly affect the structural strength, performance, power plant, operation flight characteristics or other qualities affecting airworthiness or environmental characteristics or that will be embodied in the product using non-standard practices;

“minor modification” means a type design change not listed in the aircraft, aircraft engine or propeller specifications that will not affect the mass and balance limits, structural strength, performance, power plant operations, flight characteristics or other qualities affecting airworthiness or environmental characteristics or that will be embodied in the product according to non-standard practices;

“modification” means a change to the type design of an aircraft, engine or propeller;

“operator” means a person, engaged in or offering to engage in an aircraft operation;

“overhaul” means the restoration of an aircraft or aircraft component using methods, techniques and practices

acceptable to the authority, including disassembly, cleaning and inspection as permitted, repair as necessary, and reassembly; and testing in accordance with approved standards and technical data, or in accordance with current standards and technical data acceptable to the Authority, which are developed and documented by the state of design, holder of the type certificate, supplemental type certificate, or a material, part, process, or appliance approval under Parts Manufacturing Authorisation or Technical Standard Order;

“power plant” means the system consisting of all the engines, drive system components (if applicable), and propellers (if installed), their accessories, ancillary parts, and fuel and oil systems installed on an aircraft but excluding the rotors for a helicopter;

“preventive maintenance” means simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations;

“propeller” means a device for propelling an aircraft that has blades on an engine driven shaft and that when rotated, produces by its action on the air, a thrust approximately perpendicular to its plane of rotation; it includes control components normally supplied by its manufacturer, but does not include main and auxiliary rotors or rotating airfoils of engine;

“rating” means an authorisation entered on or associated with a licence or certificate and forming part of the licence or certificate, stating special conditions, privileges or limitations pertaining to such licence or certificate;

“rebuild” means the restoration of an aircraft or aircraft component by using methods, techniques, and practices acceptable to the authority, when it has been disassembled, cleaned, inspected as permitted, repaired as necessary,

reassembled, and tested to the same tolerances and limits as a new item, using either new parts or used parts that conform to new part tolerances and limits;

“recertification” means the certification of an aircraft with or without a revision to its certification noise levels, to a standard different to that to which it was originally certificated;

“recognised airworthiness code” means the standards relating to the and maintenance of aircraft or aircraft component issued by the states of design and accepted and prescribed by the authority;

“repair” means the restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear;

“satisfactory evidence” means a set of documents or activities that the authority accepts as sufficient to show compliance with an airworthiness requirements;

“smoke” means—

- (a) hot vapour or cloud-like gases or visible gaseous or soot containing fine particles of carbon being produced by combustion;
- (b) the carbonaceous materials in exhaust emissions which obscure the transmission of light;

“specific operating provisions” means a document describing the ratings, class and or limited, in detail and containing or referencing material and process specifications used in performing repair work, along with any limitations applied to the approved maintenance organisation;

- “standard” means an object, artefact, tool, test equipment, system or experiment that stores, embodies, or otherwise provides a physical quantity which serves as the basis for measurement of the quantity; it also includes a document describing the operations and processes that must be performed in order for a particular end to be achieved;
- “State of design” means the state with jurisdiction over the organisation responsible for the type design of an aircraft;
- “State of manufacture” means the State having jurisdiction over the organisation responsible for the final assembly of the aircraft, engine or propeller;
- “State of registry” means the State on whose register the aircraft is entered;
- “subsonic jet aeroplane” means an aeroplane that is incapable of sustaining level flight at speeds exceeding flight Mach Number of 1;
- “tilt-rotor” means a powered-lift capable of vertical take-off, vertical landing, and sustained low-speed flight, which depends principally on engine driven rotors mounted on tiltable nacelles for the lift during these flight regimes and on non-rotating aerofoils for lift during high-speed flight;
- “type certificate” means a document issued by a contracting State to define the design of an aircraft engine or propeller type and to certify that this design meets the appropriate airworthiness requirements of that state;
- “type design” means the set of data and information necessary to define an aircraft, engine or propeller type for the purpose of airworthiness determination.

PART II—AIRCRAFT AND COMPONENT ORIGINAL
CERTIFICATION AND SUPPLEMENTAL TYPE CERTIFICATES

4. Acceptance of type certificate

(1) The authority may accept a type certificate or equivalent document issued by a state of design in respect of an aircraft or aircraft component where—

- (a) the type certificate or equivalent document was issued based on an airworthiness code recognised by the authority; or
- (b) the design, materials, construction equipment, performance and maintenance of aircraft or aircraft component technical evaluation against a recognised airworthiness code has been carried out by the authority and has been found to—
 - (i) meet the required standards of the recognised airworthiness code; or
 - (ii) comply with any recommendations required by the authority.

(2) The authority may, upon acceptance of the type certificate require the applicant to comply with any additional requirements before issuing a certificate of airworthiness or restricted certificate of airworthiness.

5. Recognised airworthiness codes

(1) The authority may recognise an airworthiness code issued by a State of design in respect of an aircraft or aircraft component if the design, materials, construction equipment, performance and maintenance of aircraft or aircraft component technical evaluation has been carried out by the authority and has been found to —

- (a) meet the required standards of the recognised airworthiness code; and

(b) comply with any recommendations required by the authority.

(2) The following airworthiness codes are recognised by the authority—

(a) USA Federal Aviation Administration (FAA) - Federal Aviation Regulations (FAR);

(b) UK CAA - British Civil Airworthiness Requirements (BCAR);

(c) CANADA TCCA - Canadian Aviation Regulations (CARs);

(d) BRAZIL Agência Nacional de Aviação Civil (ANAC) – Regulamento Brasileiro da Aviação Civil (RBAC)-RBHA;

(e) European Aviation Safety Agency (EASA)- Certification Specifications (CS);

(f) AUSTRALIA Civil Aviation Safety Authority (CASA)- Civil Aviation Safety Regulations (CASR's); and

(g) Civil Aviation Administration of China (CAAC)- China Civil Aviation Regulations (CCAR's).

Supplemental Type Certificate and Modifications and Repairs

6. Major modifications and repairs

(1) A person who alters a product by introducing a modification or a repair classified as major in accordance with the procedures prescribed by the authority in technical guidance material in the type design shall apply for a supplemental type certificate to—

(a) the regulatory agency of the State of design that approved the type certificate; or

(b) to the State of registry of the aircraft.

(2) Where the major modification or repair of the product is already approved by another Contracting State, the authority may accept a supplemental type certificate or equivalent approval document issued by the State of Design in respect of the major modification or repair where—

- (a) the major modification has been approved under the airworthiness code recognised in regulation 5; or
- (b) the design, materials, construction equipment, performance and maintenance of the modification of the aircraft or aircraft component technical evaluation against a recognised airworthiness code has been carried out by the Authority and has been found to—
 - (i) meet the required standards of the recognised airworthiness code; or
 - (ii) be in compliance with the requirements prescribed by the authority.

7. Minor modifications and repairs

(1) A person who alters a product by introducing a modification or repair classified as minor according to the procedures prescribed by the authority in the applicable technical guidance material, having a negligible, or no appreciable, effect on the mass, balance, structural strength, reliability, operational characteristics or other characteristics affecting the airworthiness of the aeronautical product in the type design shall apply for acceptance in a manner prescribed by the authority.

(2) Where the minor modification or repair of the product is already approved by another contracting State, the authority may accept or recognise the approval or equivalent document issued by the State of Design in respect of the modification or repair where—

- (a) the approval document recognised by the authority was issued; or

- (b) the design, materials, construction equipment, performance and maintenance of the modification of the aircraft or aircraft component technical evaluation against a recognised airworthiness code has been carried out by the authority and has been found to—
 - (i) meet the required standards of the recognised airworthiness code; or
 - (ii) has complied with any requirements prescribed by the authority.

(3) An owner or operator of an aircraft shall comply with all applicable continuing airworthiness requirements to ensure the continuing airworthiness of the aircraft during its service life, after the modification, or repair.

(4) A person authorised to approve modifications shall have sound knowledge of the design principles embodied in the aircraft type being modified or repaired.

PART III—CERTIFICATE OF AIRWORTHINESS

8. Requirement for certificate of airworthiness

(1) A person shall not fly an aircraft unless he or she is issued, in respect of that aircraft, a valid certificate of airworthiness, a restricted certificate of airworthiness or a special flight permit issued or validated by the authority or under the law of the State of registry and complies with any conditions subject to which the certificate is issued or rendered valid.

(2) Where a certificate of airworthiness is issued in a language other than English, the certificate shall include an English translation.

(3) The certificate of airworthiness shall contain the information in the Form prescribed in the Schedule 2 to these Regulations and shall be generally similar to it.

(4) The authority shall furnish to the person or persons in whose name or names the aircraft is registered, in this regulation referred to as the “registered owner”, a certificate of airworthiness, which shall include the particulars specified in subregulation (3) and the date on which the certificate was issued.

9. Application for certificate of airworthiness

An owner of an aircraft registered in Uganda or his or her agent may apply to the authority for a certificate of airworthiness for that aircraft in the manner prescribed by the authority in the applicable technical guidance material.

10. Issue of certificate of airworthiness

(1) The authority shall issue a certificate of airworthiness for an aircraft in the specific category and model designated by the State of design in the type certificate.

(2) The authority shall issue a certificate of airworthiness where—

- (a) the applicant presents to the authority an export certificate of airworthiness or similarly titled document that provides—
 - (i) the airworthiness status of the aircraft from the exporting state; and
 - (ii) exceptions to the airworthiness requirements if any;
- (b) in the case where the authority has any special certification requirements in place in addition to those adopted or required by the exporting State, make them available to the exporting State;
- (c) the authority agrees that they shall be listed as exceptions to the export certificate of airworthiness or require compliance with the additional requirements before accepting the export certificate of airworthiness;

- (d) the applicant presents evidence to the authority that the aircraft conforms to—
- (e) a type design approved under a type certificate or a supplemental type certificate; through an export airworthiness certificate issued by the importing state, or similar document;
- (f) the applicable airworthiness directives of the state of manufacture or design; and
- (g) the applicable Civil Aviation (Aircraft Nationality and Registration Marks) Regulations, 2022, Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022, any additional airworthiness requirements and these Regulations;
- (h) The aircraft has been inspected in accordance with these Regulations and found airworthy by persons authorised by the authority to make such determinations within the last thirty calendar days.
- (i) the authority finds, after an inspection, that the aircraft conforms to the type design and is in condition for safe operation;
- (j) the aircraft when operated in accordance with the requirements specified in the flight manual or equivalent document for the aircraft conforms to the approved type specifications specified in the approved type certificate or equivalent document;
- (k) the maintenance determined by the authority as a prerequisite for issue of a certificate of airworthiness has been carried out and certified by a person acceptable to the authority in accordance with the applicable Civil Aviation (Personnel Licensing) Regulations, 2022, Civil Aviation

(Approved Maintenance Organisation) Regulations, 2022 and these Regulations;

- (1) the results of flying trials, and such other tests of the aircraft as the authority may require, are complied with, and the applicant submits an export certificate of airworthiness that is valid for forty-five days from the date of issue or satisfactory evidence of airworthiness status of the aircraft as applicable issued by the state of manufacture or previous state of registry or satisfactory evidence, in whole or in part, that the aircraft complies with the applicable Standards of the Regulations through compliance with the appropriate airworthiness requirements.

(3) The authority may issue a certificate of airworthiness in accordance with these Regulations and the procedures specified in the applicable technical guidance material subject to such other conditions relating to the airworthiness of the aircraft as the authority may determine.

(4) A certificate of airworthiness shall specify one of the following categories as appropriate to the aircraft operation—

- (a) commercial air transport - passenger;
- (b) commercial air transport - cargo;
- (c) general aviation; or
- (d) aerial work.

(5) A certificate of airworthiness shall be issued subject to the condition that the aircraft shall be flown only for the following purposes —

- (a) commercial air transport - passenger: any purpose;
- (b) commercial air transport - cargo: any purpose other than commercial air transport of passengers;

(c) aerial work for any purpose other than commercial air transport or general aviation as specified in the Civil Aviation (Aerial Work) Regulations, 2022.

(d) general aviation for any purpose other than commercial air transport or aerial work.

(6) The authority may, for the purpose of issuing a certificate of airworthiness demand for specified reports and the reports shall be furnished by a person qualified to furnish such reports.

(7) An aircraft shall be subjected to such inspections, ground and flight tests as are deemed necessary by the authority to show compliance with the design aspects of the appropriate airworthiness requirements.

11. Classification of certificate of airworthiness

A certificate of airworthiness shall be classified as—

- (a) certificate of airworthiness;
- (b) restricted certificate of airworthiness;
- (c) special flight permit; or
- (d) export certificate of airworthiness.

12. Issue of restricted certificate of airworthiness

(1) The authority may issue a restricted certificate of airworthiness to a registered owner or operator for an aircraft which does not qualify for a certificate of airworthiness including microlight, experimental amateur and kit built aircraft, aircraft used for air races, aircraft flying for exhibition purposes, kites and non-type certificated aircraft.

(2) A registered owner or operator of an aircraft who holds a restricted certificate of airworthiness shall be subject to operating limitations within Uganda and shall not make international flights.

(3) The authority shall issue specific operating limitations for each restricted certificate of airworthiness.

13. Aircraft identification

An applicant for a certificate of airworthiness, a restricted certificate of airworthiness or a special flight permit shall submit proof that the aircraft is properly registered, marked and has identification plates affixed to the aircraft in accordance with the Civil Aviation (Aircraft Nationality and Registration Marks) Regulations, 2022.

14. Aircraft limitations and information

Every aircraft shall have a flight manual or pilots' operating handbook or owners' manual, placards or other documents stating the approved limitations within which the aircraft is considered airworthy as defined by the appropriate airworthiness requirements and additional instructions and information necessary for the safe operation of the aircraft.

15. Export certificate of airworthiness

(1) An owner of an aircraft registered in Uganda or an agent of the owner may apply to the authority for issue of an export certificate of airworthiness for an aeronautical product or article at least fourteen days before the intended date of export of the aeronautical product or article out of Uganda.

(2) An application for an export certificate of airworthiness shall be made in the manner prescribed by the authority in the applicable technical guidance material.

(3) The authority shall issue an export certificate of airworthiness where—

- (a) the applicant submits a statement of compliance with the full intents of the approved maintenance programme or schedule;
- (b) the applicant submits a statement of compliance with the mandatory airworthiness directives and service bulletins applicable to the aircraft and its equipment;

- (c) the aircraft has been inspected in accordance with these Regulations and found airworthy by a person authorised by the authority to make such determination, within the last fourteen days;
- (d) the maintenance determined by the authority as a prerequisite for issue of the export certificate of airworthiness has been carried out and certified by a person acceptable to the authority, in accordance with these Regulations;
- (e) the result of test flights and other tests determined by the authority are acceptable to the authority;
- (f) the historical records of the aircraft establish the production, modification and maintenance standard of the aircraft; and
- (g) the mass and balance schedule for each aircraft is, where applicable, furnished to the authority, in accordance with the applicable Regulations.

(4) An export certificate of airworthiness shall not be used for the purpose of flight but for confirmation of recent satisfactory review of the airworthiness status of the aircraft.

(5) Any extension or variation granted to an aircraft in accordance with an approved maintenance programme or schedule shall be automatically revoked before issue of the export certificate of airworthiness.

(6) The aeronautical product or article being exported shall be placed in one of the following classes—

- (a) Class I Product: a complete aircraft, engine or propeller which has been type certificated in accordance with the appropriate airworthiness requirements and for which the necessary type certificate data sheets or equivalent have been issued;

- (b) Class II Product: a major component of a Class I Product such as a wing, fuselage and empennage surface, the failure of which would jeopardise the safety of a Class I Product or any part, material or system of the product; and
- (c) Class III Product- any product or component which is not a Class I or Class II Product or standard part.

(7) In the case of an aeronautical product other than a Class I Product, the export airworthiness certification may be issued in the form of certificates or identification tags which confirm that the aeronautical product meets the approved design data, is in a condition for safe operation, and complies with any special requirements as notified by the importing State.

16. Certificate of fitness for flight

(1) A person shall not fly an aircraft for the purpose of flight testing after repair, modification or maintenance unless that aircraft has been issued with a certificate of fitness for flight containing a maintenance endorsement statement prescribed by the authority in the applicable technical guidance material.

(2) The maintenance endorsement statement referred to in subregulation (1) shall constitute a certificate of fitness for flight and shall be issued for each subsequent flight after the issue of a special flight permit issued under regulation 22.

(3) A certificate of fitness for flight shall be issued before to each flight for the purpose of flight testing after repair, modification or maintenance, during the validity of the special flight permit.

(4) A certificate of fitness for flight shall be the basis on which the authority may issue a special flight permit for the purpose of allowing an aircraft to be ferried.

(5) A certificate of fitness for flight is the basis under which the authority may issue a special flight permit under regulation 22 for the purpose of allowing the aircraft to be ferried.

17. Temporary loss of airworthiness

Any failure to maintain an aircraft in an airworthy condition as required by the appropriate airworthiness requirements shall render the aircraft ineligible for operation until the aircraft is restored to an airworthy condition.

18. Airworthiness directives and service bulletins

(1) A person shall not operate an aircraft or an aircraft component to which an airworthiness directive applies except in accordance with the requirements of the airworthiness directive.

(2) The authority shall, upon registration of an aircraft in Uganda—

- (a) notify the State of design of the registration of the aircraft in Uganda; and
- (b) request for all airworthiness directives concerning that aircraft and the airframe, aircraft engine, propeller, appliance or component.

(3) Where the State of design considers that a condition in an aircraft or in the airframe, engine, propeller, appliance or component of the aircraft is not safe as shown by the issue of an airworthiness directive by that State, the directive shall apply to a Ugandan registered aircraft of the type identified in that airworthiness directive.

(4) Where a manufacturer identifies a service bulletin as mandatory, the bulletin shall apply to a Ugandan registered aircraft of the type identified in that bulletin.

(5) The authority may identify a manufacturer's service bulletins and other sources of data, or develop and prescribe inspections, procedures and limitations for mandatory compliance relating to the affected aircraft in Uganda.

(6) A person shall not operate any Ugandan registered aircraft to which the requirements of this regulation apply, except in accordance with the applicable directives and bulletins.

19. Validity and renewal of certificate of airworthiness

(1) A certificate of airworthiness or restricted certificate of airworthiness issued under these Regulations shall be valid for twelve months from the date of issue unless—

- (a) a shorter period is specified by the authority;
- (b) the authority amends, extends, suspends, revokes or otherwise terminates the certificate; or
- (c) the aircraft owner or operator surrenders the certificate to the authority.

(2) A certificate of airworthiness or restricted certificate of airworthiness issued in respect of an aircraft shall cease to be in force where—

- (a) the aircraft or its equipment, which may be necessary for the airworthiness of the aircraft is maintained or any part of the aircraft or such equipment is removed or is replaced, other than in a manner and with material of a type not approved by the authority, either generally or in relation to a class of aircraft, or to the particular aircraft;
- (b) the aircraft or any of its equipment is not maintained as required by the maintenance programme or schedule approved by the authority in relation to the aircraft;
- (c) an inspection or modification classified as mandatory by the authority which is applicable to the aircraft or its equipment, which is necessary for the airworthiness of the aircraft has not been completed to the satisfaction of the authority; or

- (d) the aircraft or its equipment which is necessary for the airworthiness of the aircraft sustains damage and it is ascertained, during inspection, that the damage affects the airworthiness of the aircraft.

(3) An application for renewal of a certificate of airworthiness shall be made to the authority in a form and manner prescribed by the authority in the applicable technical guidance material, not earlier than sixty days before the certificate expires and not later than fourteen days before the certificate expires.

20. Amendment of certificate of airworthiness

(1) The authority may amend or modify any type of certificate of airworthiness issued under these Regulations, on the application of an operator or on the initiative of the authority.

(2) Notwithstanding subregulation (1), the authority may amend or modify any type of certificate of airworthiness issued under these Regulations under the following conditions—

- (a) modification associated with supplemental type certificate or amended type certificate;
- (b) a change to the authority and basis for issue;
- (c) a change in the aircraft model; or
- (d) a change in the operating limitations for an aircraft with a restricted airworthiness certificate.

21. Surrendering certificate of airworthiness

An owner of an aircraft who sells the aircraft shall surrender the certificate of airworthiness or the restricted certificate of airworthiness or the special flight permit, as may be applicable—

- (a) to the buyer, upon sale of the aircraft within Uganda; or
- (b) to the authority, in the case of an aircraft sold outside Uganda.

22. Issue of special flight permit

(1) The authority may issue a special flight permit for an aircraft that does not meet the airworthiness requirements applicable to the aircraft, but where the aircraft is capable of safe flight for the purpose of—

- (a) flying to a base where weighing, painting, repairs, modifications, maintenance or inspections are to be performed;
- (b) flying to a point of storage;
- (c) experimenting with or testing the aircraft, including its engines and equipment;
- (d) qualifying for the issue, renewal or validation of a certificate of airworthiness or a restricted certificate of airworthiness or the approval of modification of the aircraft;
- (e) delivering or exporting the aircraft;
- (f) evacuating the aircraft from an area of impending danger;
or
- (g) operating at a mass in excess of the maximum certified takeoff mass for the aircraft, for a flight beyond the normal range, over water or land areas where adequate landing facilities or appropriate fuel are not available, where the excess mass shall be limited to additional fuel, fuel carrying facilities and navigation equipment necessary for the flight.

(2) A special flight permit shall be valid for the period specified in the permit.

23. Conditions on special flight permit

(1) A person shall not fly an aircraft on a special flight permit unless that person has complied with the conditions specified in these Regulations.

(2) A person who flies an aircraft on a special flight permit shall only do so where —

- (a) the flight is made under the supervision of a person approved by the authority for the flight, subject to any additional conditions which may be specified in the permit;
- (b) a copy of the permit is carried on board the aircraft at all times when the aircraft is operating under the conditions of the permit;
- (c) the aircraft registration markings assigned to the aircraft are displayed;
- (d) no person or property is carried on board for hire or reward;
- (e) only persons essential for the safe operation of the aircraft are carried on the aircraft, who shall be advised of the contents of the permit and the airworthiness status of the aircraft;
- (f) the aircraft is operated only by flight crew—
 - (i) holding the appropriate licence acceptable to the authority;
 - (ii) with sufficient experience to appreciate the reasons for the aircraft's non-compliance to the prescribed airworthiness standards; and
 - (iii) who are aware of the purpose of the flight and any limitations imposed.
- (g) the flight is conducted in accordance with applicable flight operating rules and procedures of the States of intended routing;
- (h) the routing is such that areas of heavy air traffic, areas of heavy human concentration of cities, town settlements or any other areas where the flight may create hazardous exposure to persons or property are avoided;

- (i) the flight is performed in accordance with the performance limitations prescribed in the aircraft flight manual and any other limitation that the authority may impose on the flight;
- (j) all flights are conducted before the expiry date of the special flight permit or at any other time declared by the authority in writing; and
- (k) the aircraft has on board authorisations from the State of intended routing.

(3) Where an aircraft is not in compliance with these Regulations and the flight involves operations over States other than Uganda, the operator of the aircraft shall obtain the necessary overflight authorisations from the respective authorities of each of those States before undertaking the flight.

(4) Where an aircraft intends to fly over Uganda on a special flight permit issued by another State the operator of the aircraft shall obtain the necessary overflight authorisations from the authority.

(5) An aircraft on a special flight permit shall be maintained to a degree necessary to ensure safe flight and a maintenance release signed by a person licensed in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022 or a maintenance organisation approved in accordance with the Civil Aviation (Approved Maintenance Organisation) Regulations, 2022.

(6) The authority shall require a properly executed certificate of fitness for flight of the aircraft issued by an authorised person, stating that the subject aircraft has been inspected and found to be safe for the intended flight.

PART IV—CONTINUING AIRWORTHINESS OF AIRCRAFT AND AIRCRAFT COMPONENTS

24. Responsibility of maintaining airworthiness of aircraft

(1) A registered owner or operator of an aircraft shall be responsible for maintaining the aircraft in an airworthy condition by ensuring that—

- (a) all the maintenance which affects the airworthiness of the aircraft is performed as prescribed by the State of registry;
- (b) the maintenance personnel make the appropriate entries in the aircraft maintenance records certifying that the aircraft is airworthy;
- (c) the certificate of release to service is completed and is to the effect that the maintenance work performed has been completed satisfactorily in accordance with the aircraft and aircraft component manufacturer's recommendations, instructions for continued airworthiness and aircraft maintenance program approved by the State of Registry; and
- (d) in the event that there are open discrepancies, the certificate of release to service comprises a list of the uncorrected maintenance for which temporary relief is provided in the Minimum Equipment List and these items are made a part of the aircraft's permanent record.

(2) In the event that an aircraft registered in Uganda is continuously operated outside Uganda for a period exceeding thirty days, the owner or operator of the aircraft shall be responsible for the maintenance of the aircraft in an airworthy condition and shall ensure that—

- (a) notice in a form prescribed by the authority, is given to the authority before the aircraft undertakes such operations; and
- (b) arrangements that are acceptable to the authority for ongoing inspection and oversight of the airworthiness of that aircraft are made.

25. Continuing airworthiness information

- (1) An operator of an aircraft shall—
 - (a) monitor and assess the maintenance and operational experience with respect to continuing airworthiness of the

aircraft and provide the information prescribed by the authority and shall report using the specified system; and

- (b) obtain and assess information and recommendations for continuing airworthiness, availed by the organisation responsible for the type design and implement resulting actions considered necessary, in accordance with the procedure acceptable to the authority.

(2) An owner or operator of an aircraft shall avail information for use in developing procedures for maintaining the aircraft in an airworthy condition.

(3) The maintenance information referred to in sub regulation (2) shall include —

- (a) a description of the aircraft and recommended methods for the accomplishment of maintenance tasks; and
- (b) a guidance on defect diagnosis and ageing aircraft maintenance requirements.

(4) A failure to maintain an aircraft in an airworthy condition as defined by the appropriate airworthiness requirements shall make the aircraft ineligible for operation until the aircraft is restored to an airworthy condition.

(5) The owner or operator of an aeroplane over 5700 kilograms maximum certificated take-off mass shall obtain and assess continuing airworthiness information and recommendations available from the organisation responsible for the type design and shall implement resulting actions considered necessary in accordance with the procedures established by the owner or operator and acceptable to the authority.

(6) The operator of a helicopter of over 3175 kilograms maximum mass shall monitor and assess the maintenance and operational experience of the helicopter with respect to the continuing airworthiness

of the helicopter and shall provide the information prescribed by the State of registry and report, as prescribed by the authority.

26. Damage to aircraft.

(1) Where an aircraft sustains damage, the State of registry shall decide whether the damage is of a nature such that the aircraft is no longer airworthy as defined in appropriate airworthiness requirements.

(2) Where the damage is sustained or ascertained when the aircraft is in the territory of another contracting State, the authorities of the other contracting State shall be entitled to prevent the aircraft from resuming its flight on condition that they shall advise the authority immediately, communicating to it all the information necessary to formulate the decision referred to in subregulation (1).

(3) Where the authority considers that the damage sustained is of a nature such that the aircraft is no longer airworthy, the authority shall prohibit the aircraft from resuming flight until it is restored to an airworthy condition.

(4) The authority may, in exceptional circumstances, prescribe particular limiting conditions to permit the aircraft to fly a non-commercial air transport operation to an aerodrome at which it is restored to an airworthy condition.

(5) In prescribing the particular limiting conditions referred to in subregulation (4), the authority shall consider all the limitations proposed by the contracting State that had originally, in accordance with subregulation (2), prevented the aircraft from resuming its flight.

(6) Notwithstanding subregulation (4), the contracting State shall permit such flight or flights within the prescribed limitations.

(7) The aircraft shall be allowed to resume its flight where the State of Registry considers that the damage sustained is of a nature such that the aircraft is still airworthy.

27. Compliance with instructions of manufacturer

(1) An aircraft registered in Uganda shall not engage in commercial air transport operations, unless—

- (a) the aircraft, including its engines, equipment and radios are maintained in accordance with the approved aircraft maintenance programme and maintenance procedures recommended by the aircraft manufacturer;
- (b) a certificate of release to service has been completed and signed by a licensed aircraft maintenance engineer to certify that all maintenance work has been completed satisfactorily and in accordance with the approved aircraft maintenance programme and manufacturer's maintenance procedures; and
- (c) there is an approved flight manual available on the aircraft for use by the flight crew, containing the limitations within which the aircraft is considered airworthy, together with any additional instructions and information necessary to show compliance with the specified regulations, relating to the performance and for the safe operation of the aircraft.

(2) Where the aircraft has a maximum take-off certificated mass of five thousand seven hundred kilo grammes or less, the limitations may be made available by means of placards or other documents approved by the authority.

28. Reporting of failures, malfunctions and defects

(1) A registered owner or operator of an aircraft registered in Uganda shall report to the authority any failures, malfunctions or defects that may result in at least one of the following—

- (a) fires during flight and whether the related fire-warning system properly operated;

- (b) fires during flight not protected by a related fire-warning system;
- (c) false fire warning during flight;
- (d) an engine exhaust system that causes damage to the engine, adjacent structure, equipment or components during a flight;
- (e) an aircraft component that causes accumulation or circulation of smoke, vapour or toxic or noxious fumes in the crew compartment or passenger cabin during flight;
- (f) engine shutdown during a flight because of flameout;
- (g) engine shutdown during a flight when external damage to the engine or the aircraft structure occurs;
- (h) engine shutdown during a flight due to foreign object ingestion or icing;
- (i) shutdown during a flight of more than one engine on a multi-engine aircraft;
- (j) a propeller feathering malfunction or inability of the system to control over-speed during a flight;
- (k) a fuel or fuel-dumping system malfunction that affects fuel flow or causes hazardous leakage during a flight;
- (l) an uncommanded landing gear extension or retraction, or opening or closing of landing gear doors during a flight;
- (m) brake system components malfunction that result in loss of brake actuating force when the aircraft is in motion on the ground;
- (n) an aircraft structure damage that requires major repair;
- (o) failure or malfunction of any flight control system, flap, slat or spoiler;

- (p) any excessive unscheduled removals of essential equipment on account of defects;
- (q) cracks, permanent deformation or corrosion of aircraft structure, where these are more than the maximum acceptable to the manufacturer or the authority;
- (r) aircraft components or systems malfunctions that result in taking emergency actions during flight except action to shut down an engine;
- (s) emergency evacuation systems or components including all exit doors, passenger emergency evacuating lighting systems, or evacuation equipment that are found defective, or that fail to perform the intended functions during an actual emergency or during training, testing, maintenance, demonstration, or inadvertent deployments;
- (t) every interruption to a flight, unscheduled change of aircraft en route, or unscheduled stop or diversion from a route, caused by known or suspected technical difficulties or malfunctions;
- (u) any abnormal vibration or buffeting caused by a structural or system malfunction, defect, or failure;
- (v) failure or malfunction of more than one attitude, airspeed, or attitude instrument during a given operation of the aircraft;
- (w) the number of engines removed prematurely because of malfunction, failure or defect, listed by make and model and the aircraft type in which the engines were installed;
or
- (x) the number of propeller featherings in flight, listed by type of propeller and engine and aircraft on which the propellers were installed.

- (2) A report under this regulation shall—
- (a) be made within 3 days after determining that the failure, malfunction or defect required to be reported has occurred; and
 - (b) include the following information—
 - (i) the type and registration mark of the aircraft;
 - (ii) the name of the operator of the aircraft;
 - (iii) the aircraft serial number;
 - (iv) where the failure, malfunction, or defect is associated with an article approved under a Technical Standard Order authorisation, the article serial number and model designation, as may be appropriate;
 - (v) where the failure, malfunction or defect is associated with an engine or propeller, the engine or propeller serial number, as may be appropriate;
 - (vi) the product model;
 - (vii) identification of the part, component, or system involved, including the part number; and
 - (viii) the nature of the failure, malfunction, or defect.

(3) Where the aircraft is registered in Uganda, the authority shall upon receipt of the report under this regulation, submit the report to the State of design.

(4) Where a foreign registered aircraft operating in Uganda, the authority shall, upon receipt of the report required under this regulation, submit the report to the state of registry.

29. Responsibilities of State of registry in respect of continuing airworthiness

- (1) The authority shall—
 - (a) where it first enters on its register an aircraft of a particular type for which Uganda is not the State of design and issues or validates a certificate of airworthiness in accordance with regulation 10, notify the State of design that it has entered such an aircraft on its register;
 - (b) when approving a maintenance organisation or accepting the approval of a maintenance organisation issued by another contracting State, verify compliance with the Civil Aviation (Approved Maintenance Organisation) Regulations, 2022; and
 - (c) ensure that sensitive aviation security information is not transmitted when distributing mandatory continuing airworthiness information.
- (2) An owner or operator of an aircraft shall not operate the aircraft unless there are established procedures approved by the authority to—
 - (a) determine the continuing airworthiness of the aircraft in relation to the appropriate airworthiness requirements in force for that aircraft;
 - (b) ensure that the aircraft continues to be maintained in airworthy condition and in compliance with the maintenance requirements of the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.
 - (c) ensure that the aircraft continues to comply with the appropriate airworthiness requirements after modification, repair or installation of a replacement part;

- (d) upon receipt of mandatory continuing airworthiness information from the State of design, adopt the mandatory information directly or assess the information received and take appropriate action;
- (e) ensure that all mandatory continuing airworthiness information originated by the authority in respect of an aircraft is transmitted to the appropriate State of design;
- (f) ensure that, in respect of an aeroplane with over 5,700 kilograms and a helicopter with over 3,175 kilograms maximum certificated take-off mass, there exists a system by which information on faults, malfunctions, defects and other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aeroplane or helicopter aircraft is transmitted to the organisation responsible for the type design of that aeroplane or helicopter;
- (g) ensure that sensitive aviation security information is securely transmitted to the appropriate authority in the State of design in accordance with the Civil Aviation (Security) Regulations, 2022;
- (h) ensure that the type of information to be reported to the authority or organisations responsible for type design and maintenance organisations in respect of aeroplanes with over 5,700 kilograms and helicopters with over 3,175 kilograms maximum certificated take-off mass, is communicated through procedures established by the owner or operator of the aeroplane or helicopter and is acceptable to the authority as determined in the technical guidance materials;
- (i) where a continuing airworthiness safety issue is associated with a modification, the State of registry shall ensure that there exists a system by which the information relating to the safety issue associated with the modification is transmitted to the organisation responsible for the design of the modification; and

- (j) subject to paragraph (i) whenever the information relates to an engine or propeller, the information shall be transmitted to both the organisation responsible for the engine or propeller type design and the organisation responsible for the aircraft type design.

PART V—AIRCRAFT MAINTENANCE AND INSPECTION

30. General requirements for maintenance and inspections

(1) A person shall not operate an aircraft unless the aircraft and its components are maintained in accordance with a maintenance program approved by the authority.

(2) The maintenance program shall include a description of the aircraft and its components, the recommended methods for the accomplishment of maintenance tasks and information on guidance on defect diagnosis.

(3) The maintenance program shall include the maintenance tasks and the recommended intervals at which the tasks are to be performed.

(4) Maintenance tasks and frequencies specified as mandatory by the State of design in approval of the type design shall be identified in the maintenance program.

(5) The maintenance program shall have a maintenance release process, including signed documentation, in a manner satisfactory to the authority, indicating that the maintenance performed has been completed satisfactorily.

(6) A maintenance release shall contain a certification including—

- (a) basic details of the maintenance carried out and approved reference to the data used;
- (b) the date on which the maintenance was completed;

- (c) the identity of the approved maintenance organisation; and
- (d) the identity of the person signing the release.

31. Persons authorised to perform maintenance, preventive maintenance and modifications

(1) A person shall not perform any task related to the maintenance of an aircraft or aircraft components, except as provided in these Regulations.

(2) The persons authorised to perform maintenance, preventive maintenance and modifications are—

- (a) a pilot licensed by the authority;
- (b) a licensed aircraft maintenance engineer;
- (c) a person performing maintenance under the supervision of a licensed aircraft maintenance engineer; and
- (d) an approved maintenance organisation.

(3) Subject to subregulation (2), a pilot licensed by the authority may only perform preventive maintenance on an aircraft where—

- (a) the maximum certificated take-off mass of the aircraft is 2,370 kilograms or less;
- (b) the aircraft is owned or operated by that pilot;
- (c) the aircraft is not listed for use by a holder of an air operator certificate; and
- (d) the pilot has undertaken a maintenance course for that type of aircraft.

(4) Subject to subregulation (2), a pilot licenced by the authority who operates a balloon listed for use by a holder of an

aircraft operation certificate may perform maintenance, preventive maintenance and modifications on balloons, provided that the pilot is trained in the appropriate balloon maintenance.

(5) A licensed aircraft maintenance engineer may perform or supervise the maintenance or modifications of an aircraft or aircraft component for which he or she is rated in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

(6) A person working under the supervision of a licensed aircraft maintenance engineer may perform the maintenance, preventive maintenance or modifications that a licensed aircraft maintenance engineer is authorised to perform where the supervising licensed aircraft maintenance engineer—

- (a) personally observes the work being done to the extent necessary to ensure that it is being done properly; and
- (b) is readily available, in person, for consultation.

(7) An approved maintenance organisation may perform aircraft maintenance within the limits specified by the Authority.

(8) A manufacturer who holds an approved maintenance organisation certificate may—

- (a) maintain or modify any aircraft component manufactured by that manufacturer under a type or production certificate;
- (b) maintain or modify any aircraft component manufactured by that manufacturer under a technical standard order authorisation, parts manufacturer approval by the State of design or product and process specification issued by the State of design;
- (c) perform any inspection required under the Civil Aviation (Operation of Aircraft - Commercial Air Transport

Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 on aircraft manufactured by that manufacturer, for aircraft operating under a production certificate or under an approved production inspection system for that aircraft.

32. Personnel authorised to approve return to service of aircraft

(1) Except as authorised by the authority, a person shall not approve an aircraft, airframe, engine, propeller, appliance or component for return to service after it has undergone maintenance, preventive maintenance, rebuilding or modification.

(2) The following personnel may be authorised to approve for return to service—

- (a) a pilot licensed by the authority, who may return an aircraft to service after performing the authorised preventive maintenance provided—
 - (i) the maximum certificated take-off mass of the aircraft is 2,370 kilograms or less;
 - (ii) the aircraft is owned or operated by that pilot;
 - (iii) the aircraft is not listed for use by a holder of an air operator certificate; and
 - (iv) the pilot has undertaken a maintenance course for that type of aircraft.
- (b) a licensed aircraft maintenance engineer, who may approve aircraft and aircraft components for return to service after the licensed aircraft maintenance engineer has performed or supervised the maintenance or inspected the maintenance carried out, subject to the Civil Aviation (Personnel Licensing) Regulations, 2022 and the Civil

Aviation (Air Operator Certification and Administration) Regulations, 2022; and

- (c) an approved maintenance organisation, which may approve aircraft and aircraft components for return to service as provided in the specific operating provisions approved by the authority.

33. Persons authorised to perform inspections

(1) A person shall not perform an inspection of an aircraft or aircraft components, before or after the aircraft has undergone maintenance, preventive maintenance, rebuilding or modification, unless he or she is authorised by the authority.

(2) The following are authorised to carry out inspections—

- (a) a licensed aircraft maintenance engineer, who may conduct the required inspections of aircraft and aircraft components for which the licensed aircraft maintenance engineer is rated; or
- (b) an approved maintenance organisation, which may perform the required inspections of aircraft and aircraft components as provided in the specific operating provisions approved by the authority.

34. Preventive maintenance limitations

Preventive maintenance shall be limited to—

- (a) the removal, installation and repair of landing gear tires;
- (b) replacing elastic shock absorber cords on landing gear;
- (c) servicing landing gear shock struts by adding oil or air or both;
- (d) servicing landing gear wheel bearings;
- (e) replacing defective safety wiring or cotter keys;

- (f) lubrication which does not require disassembly other than the removal of nonstructural items;
- (g) making simple fabric patches not requiring rib stitching or the removal of structural parts or control surfaces;
- (h) replenishing hydraulic fluid in the hydraulic reservoir;
- (i) refinishing decorative coating of fuselage, wings, tail group surfaces excluding balanced control surfaces, fairings, cowling, landing gear, cabin or cockpit interior when removal or disassembly of any primary structure or operating system is not required;
- (j) applying preservative or protective material to components where no disassembly of any primary structure or operating system is involved and where the coating is not prohibited or is not contrary to good practices;
- (k) repairing the upholstery and decorative furnishings of the cabin or cockpit where the repairing does not require disassembly of any primary structure or operating system and does not interfere with any operating system or affect the primary structure of the aircraft;
- (l) making small simple repairs to fairings, non-structural cover plates, cowling and small patches and reinforcements without changing the contour in a way that interferes with proper airflow;
- (m) replacing side windows where the replacement does not interfere with the structure of any operating system;
- (n) replacing safety belts;
- (o) replacing seats or seat parts with replacement parts approved for the aircraft, which does not involve disassembly of any primary structure or operating system;
- (p) troubleshooting and repairing broken circuits in landing light wiring circuits;

- (q) replacing bulbs, reflectors and lenses of position and landing lights;
- (r) replacing wheels and skis where no mass or balance computation is involved;
- (s) replacing any cowling which does not require the removal of the propeller or the disconnection of flight controls;
- (t) replacing or cleaning spark plugs and setting of the spark plug gap clearance;
- (u) replacing any hose connection; except hydraulic connections;
- (v) replacing prefabricated fuel lines;
- (w) cleaning fuel and oil strainers;
- (x) replacing and servicing batteries;
- (y) replacement or adjustment of non-structural fasteners which are incidental to the operations of the aircraft; and
- (z) the installation of anti-misfueling devices to reduce the diameter of fuel tank filler openings; provided the specific device has been made a part of the aircraft type certificate data by the aircraft manufacturer and the manufacturer has provided appropriately approved instructions acceptable to the authority for the installation of the specific device, and the installation does not involve the disassembly of the existing filler opening.

Performance Rules

35. Maintenance

(1) A person who performs maintenance, preventive maintenance or modifications on an aircraft or aircraft component shall use the methods, techniques and practices prescribed in—

- (a) the current version of the manufacturer's maintenance manual or instructions for continued airworthiness issued by the manufacturer of the aircraft or aircraft component; or
- (b) any methods, techniques and practices required by the authority or any methods, techniques and practices that may be approved by the authority, where the manufacturer's maintenance manual or instructions are not available.

(2) A person shall use the tools, equipment and test apparatus necessary to ensure completion of the work in accordance with accepted industry practices.

(3) Where the manufacturer recommends special equipment or test apparatus, the person performing maintenance shall use that equipment or apparatus or its equivalent acceptable to the authority.

(4) A person who performs maintenance, preventive maintenance or modification on an aircraft or aircraft component shall do that work in such a manner that, and shall use materials of a quality that ensures that the condition of the aircraft or aircraft component worked on are at least equal to its original or properly altered condition with regard to the aerodynamic function, structural strength, resistance to vibration and deterioration and any other qualities that affect airworthiness.

(5) The methods, techniques and practices contained in the maintenance control manual and maintenance programme of the holder of an aircraft operator certificate, which are approved by the authority, shall constitute an acceptable means of compliance with the requirements of these Regulations.

36. Inspection

(1) A person who conducts an inspection on an aircraft required by the authority shall—

- (a) conduct the inspection so as to determine whether the aircraft or portion of the aircraft under inspection meets all the applicable airworthiness requirements; and
- (b) where there is a particular approved aircraft maintenance program required or accepted for the aircraft being inspected, conduct the inspection in accordance with the instructions and procedures specified in the approved aircraft maintenance program.

(2) Subject to subregulation (1), a person who performs an inspection required on a rotorcraft, shall inspect the systems of the rotorcraft, in accordance with the maintenance manual or instructions for continued airworthiness.

(3) The systems to be inspected shall include—

- (a) the drive shafts or similar systems;
- (b) the main rotor transmission gear box for obvious defects;
- (c) the main rotor and centre section or the equivalent area; and
- (d) the auxiliary rotor on helicopters.

(4) A person who performs an inspection shall, before that inspection, thoroughly clean the aircraft and aircraft engine and remove or open all the necessary inspection plates, access doors, fairings and cowlings.

37. Checklist

(1) A person who performs an inspection shall use a checklist while performing the inspection, and the checklist shall include the scope and detail of the items prescribed or approved by the authority.

(2) A checklist may be of the person's own design, one provided by the manufacturer of the equipment being inspected or one obtained from another source.

(3) A person who inspects and approves a reciprocating-engine-powered aircraft for return to service after an inspection shall, before that approval, run the aircraft engine or engines to determine that the performance of the engine or engines is satisfactory.

(4) For the purpose of these Regulations, the performance of the engine shall be in accordance with the recommendations of the manufacturer with regard to—

- (a) power output, both static and idle revolutions per minute;
- (b) magnetos;
- (c) fuel and oil pressure; and
- (e) cylinder and oil temperature.

38. Turbine-engine powered aircraft approval

A person who approves a turbine-engine-powered aircraft for return to service shall, before that approval, run the aircraft engine or engines to determine that the performance of the engine or engines is satisfactory, in accordance with the recommendations of the manufacturer.

39. Areas of inspection

(1) A person who performs an inspection shall, before that inspection, thoroughly clean the aircraft and aircraft engine and remove or open all necessary inspection plates, access doors, fairings and cowlings.

(2) A person who performs an inspection shall, where applicable, inspect—

- (a) the fuselage and hull group and specifically—
 - (i) the fabric and skin for deterioration, distortion, other evidence of failure, and defective or insecure attachment of fittings; and
 - (ii) the systems and components for improper installation, apparent defects, and unsatisfactory operation;

- (b) the cabin and cockpit group—
 - (i) generally, for uncleanliness and loose equipment that might foul the controls;
 - (ii) the seats and safety belts for poor condition and apparent defects;
 - (iii) leakages;
 - (iv) the instruments, for any poor condition, mounting, marking, and where practicable for improper operation;
 - (v) the flight and engine controls, for any improper installation or improper operation;
 - (vi) the batteries for any improper installation or improper charge; and
 - (vii) all systems for improper installation, poor general condition, apparent and obvious defects, and insecurity of attachment;
- (c) the engine and nacelle group including—
 - (i) the engine section for visual evidence of excessive oil, fuel or hydraulic leaks, and sources of such leaks;
 - (ii) the studs and nuts for improper torque loading and obvious defects;
 - (iii) the internal engine for cylinder compression and for metal particles or foreign matter on screens and sump drain plugs and where there is weak cylinder compression, for improper internal condition and improper internal tolerances;
 - (iv) the engine mount for cracks, looseness of mounting, and looseness of engine to mount;

- (v) the flexible vibration dampeners, for poor condition and deterioration;
 - (vi) the engine controls for defects, improper travel, and improper safety locking;
 - (vii) lines, hoses and clamps for leaks, improper condition, and looseness;
 - (viii) exhaust stacks for cracks, defects, and improper attachment;
 - (ix) accessories for apparent defects in security of mounting;
 - (x) all systems for improper installation, poor general condition, defects, and insecure attachment; and
 - (xi) the cowling for cracks and defects;
- (d) the landing gear group including—
- (i) all the units for poor condition and insecurity of attachment;
 - (ii) the shock absorbing devices for improper oleo fluid level;
 - (iii) linkages, trusses, and members for undue or excessive wear, fatigue, and distortion;
 - (iv) retracting and locking mechanism for improper operation;
 - (v) hydraulic lines for leakage;
 - (vi) electrical system for chafing and improper operation of switches;
 - (vii) wheels for cracks, defects, and condition of bearings;
 - (viii) tires for wear and cuts;

- (ix) brakes for improper adjustment; and
 - (x) floats and skis for insecure attachment and obvious or apparent defects;
- (e) the wing and centre section assembly for—
- (i) poor general condition;
 - (ii) fabric or skin deterioration;
 - (iii) distortion;
 - (iv) evidence of failure; and
 - (v) insecurity of attachment;
- (f) the complete empennage assembly for—
- (i) poor general condition;
 - (ii) fabric or skin deterioration;
 - (iii) distortion;
 - (iv) evidence of failure;
 - (v) insecure attachment;
 - (vi) improper component installation; and
 - (vii) improper component operation;
- (g) the propeller group including—
- (i) the propeller assembly for cracks, nicks, binds and oil leakage;
 - (ii) the bolts for improper torque loading and lack of safety;
 - (iii) the anti-icing device for improper operations and obvious defects; and

- (iv) the control mechanisms for improper operation, insecure mounting, and restricted travel;
- (h) the avionics and instrument equipment:
 - (i) for improper installation and insecure mounting;
 - (ii) the wiring and conduits for improper routing, insecure mounting and obvious defects;
 - (iii) the bonding and shielding for improper installation and poor condition; and
 - (iv) the antenna including the trailing antenna for poor condition, insecure mounting, and improper operation;
- (i) the electronic or electrical group including—
 - (i) the wiring and conduits for improper routing, insecure mounting and obvious defects; and
 - (ii) the bonding and shielding for improper installation and poor condition; and
- (j) each installed miscellaneous item that is not specified in this subregulation or which has instructions for continued airworthiness, for improper installation and improper operation.

40. Airworthiness limitation performance rules

A person who performs an inspection or other maintenance specified in an airworthiness limitation section of a manufacturer's maintenance manual, or instructions for continued airworthiness, shall perform the inspection or other maintenance in accordance with that section, or in accordance with specific operating provisions approved by the authority.

41. Aircraft mass schedule

(1) An aircraft in respect of which a certificate of airworthiness is issued under these Regulations shall be weighed and the position of

the aircraft's centre of gravity determined, in accordance with these Regulations at such times and in such manner as the authority may require or approve in the case of that aircraft.

(2) An aircraft shall be weighed to determine its basic weight and the corresponding centre of gravity position when all manufacturing processes have been completed.

(3) An aircraft exceeding 5,700 kilograms (12500 lb) maximum take off weight shall be re-weighed two years after the date of manufacture and thereafter at intervals not exceeding five years and at such times as the authority may require.

(4) An aircraft not exceeding 5,700 kilograms (12500 lb) maximum take off weight shall be weighed at intervals not exceeding five years and at such times as the authority may require.

(5) The owner or operator of an aircraft shall, upon the aircraft being weighed, prepare a mass schedule showing—

- (a) the basic mass of the aircraft, namely the mass of the empty aircraft together with the mass of unusable fuel and unusable oil in the aircraft and of such items of equipment as are indicated in the mass schedule or such other mass as may be approved by the authority in the case of that aircraft;
- (b) the position of the centre of gravity of the aircraft when the aircraft contains only the items included in the basic mass or such other position of the centre of gravity as may be approved by the authority in the case of that aircraft;
- (c) the loading information shall include the empty mass of the aircraft, together with a definition of the condition of the aircraft at the time of weighing, the corresponding centre of gravity position, and the reference points and datum lines to which the centre of gravity limits are related; and

- (d) the loading limitations shall include all limiting masses, centers of gravity positions, mass distributions, and floor loadings.

(6) The mass schedule shall be preserved by the operator of the aircraft until the expiration of a period of six months following the next occasion on which the aircraft is weighed for the purpose of this Regulation.

42. Markings and Placards

An aircraft owner or operator shall ensure that markings and placards—

- (a) on instruments, equipment, controls and any such items, shall include such limitations or information as necessary for the direct attention of the flight crew during flight; and
- (b) provide information that is essential to the ground crew in order to preclude the possibility of mistakes in ground servicing such as towing and refueling that could pass unnoticed and that could jeopardize the safety of the aircraft in subsequent flights.

PART VI— AIRCRAFT NOISE CERTIFICATION

43. Requirement for noise certification

(1) An owner or operator of an aircraft under these Regulations shall not land or take-off with the aircraft in Uganda unless he or she has a valid noise certificate or a document attesting noise certification issued by the State of registry.

(2) A noise certificate or a document attesting noise certification issued by the manufacturer or another contracting State shall be accepted by the authority on the basis of the information and satisfactory evidence provided by the manufacturer.

(3) Subject to subregulation (2), in accepting a noise certificate or a document attesting noise certification issued by the manufacturer, the authority may issue its own noise certificate in accordance with the procedures specified in the applicable technical guidance material.

(4) The noise certificate or document attesting noise certification shall be carried on board the aircraft at all times.

(5) An application for a noise certificate shall include—

(a) for a new aircraft—

(i) a statement of conformity issued by the State of manufacture or the exporting authority;

(ii) the noise information determined in accordance with the applicable noise requirements;

(b) for a used aircraft—

(i) the noise information determined in accordance with applicable noise requirements; and

(ii) historical records to establish the production, modification and maintenance standard of the aircraft.

44. Noise certificate

(1) A document attesting noise certification for an aircraft shall contain at least the information contained in Part B of Schedule 3 to these Regulations.

(2) Item headings on a noise certification document shall be uniformly numbered in Arabic numerals, as indicated in subregulation (1), so that on any noise certification document the number shall, under any arrangement, refer to the same item heading, except where the information in Items 1 through 6 and Items 18 through 20 in Part B of Schedule 3 to these Regulations is given in the Certificate of Airworthiness, in which case the numbering system of the Certificate of Airworthiness according to these Regulations shall prevail.

(3) A noise certificate shall be classified in accordance with Part A of Schedule 3 to these Regulations.

(4) The authority shall issue a noise certificate based on the manufacturer noise certification in accordance with procedures prescribed by the authority.

(5) The authority shall recognise as valid, a noise certification granted by another contracting State provided that the requirements under which the certification was granted are at least equal to the applicable standards specified in these Regulations.

45. Issuance, suspension and revocation of aircraft noise certificate

(1) An aircraft included in the classification prescribed for noise certification purposes in Part A of Schedule 3 to these Regulations shall be issued with a noise certificate set out in Schedule 3 to these Regulations or a suitable statement attesting noise certification contained in another document approved by the state of registry and required by that State to be carried in the aircraft.

(2) The noise certificate referred to in subregulation (1) shall be issued or validated by the authority on the basis of satisfactory evidence that the aircraft complies with requirements which are at least equal to the applicable standards specified in Schedule 3 to these Regulations.

(3) The document attesting noise certification of an aircraft shall provide information in accordance with Part B of Schedule 3 to these Regulations.

(4) The authority—

(a) shall suspend or revoke the noise certificate of an aircraft which is on the civil aircraft register where the aircraft ceases to comply with the applicable noise standards; and

(b) shall not re-instate or grant a new noise certificate unless the aircraft is found, on reassessment, to comply with the applicable noise standards.

(5) Subregulations (2), (3) and (4) apply to all engines included in the classifications defined for emission certification purposes where the engines are fitted to aircraft engaged in international air navigation.

PART VII— MAINTENANCE RECORDS AND ENTRIES

46. Keeping certificate of release to service records

(1) A certificate of release to service shall be kept by an owner or operator in duplicate.

(2) A certificate of release to service shall be effective from the date of issue and shall cease to be effective upon the expiry of the period in calendar days or flight time, whichever is earlier, specified in the approved aircraft maintenance program.

(3) The original copy of the certificate of release of service shall be kept by the operator in a place approved by the authority and the duplicate copy of the certificate of release to service shall be kept on board the aircraft.

47. Technical logbook

(1) An operator of an aircraft registered in Uganda in respect of which a certificate in commercial air transport or aerial work category has been issued shall keep a technical logbook for that aircraft.

(2) An entry of a defect which affects the airworthiness and safe operation of an aircraft shall be made in the technical logbook of the aircraft as specified in the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

(3) Upon rectification of any defect and after the issuance of a certificate of release to service, a person who issues the certificate

of release to service under the Civil Aviation (Approved Maintenance Organisation) Regulations, 2022 shall, in respect of the defect which is rectified, enter the certificate in the technical logbook in accordance with subregulation (2).

48. Aircraft, engine and propeller logbooks

(1) The following log books shall be kept in respect of all aircraft registered in Uganda—

- (a) an aircraft log book;
- (b) a log book for each engine fitted in the aircraft; and
- (c) a log book for each variable pitch propeller fitted to the aircraft.

(2) A log book shall include the particulars specified in Schedule 4 to these Regulations and in the case of an aircraft having a maximum certificated take-off mass of 2730 kilograms or less, the logbooks shall be of a type approved by the authority.

(3) An entry in a log book other than an entry referred to in subparagraphs 3(d) (ii) and 4 (d) (ii) of Schedule 4 to these Regulations shall be made—

- (a) as soon as practicable after the occurrence of the event to which it relates, but not more than seven days after the expiration of the certificate of release to service of the aircraft at the time of the occurrence of the event; and
- (b) when any maintenance, overhaul, repair, replacement, modification or inspection is undertaken on the engine or propeller, as the case may be.

(4) An entry in the log book may refer to other documents which shall be clearly identified, and the documents referred to shall be deemed, for the purposes of these Regulations, to be part of the log book.

(5) It shall be the duty of the operator of an aircraft in respect of which log books are required to be kept, to keep the log books or cause them to be kept in accordance with this regulation.

(6) Subject to this regulation, every log book shall be preserved by the operator of the aircraft for two years after which the aircraft, the engine or the variable pitch propeller, as the case may be, is destroyed or is permanently withdrawn from use.

(7) A clear record of continued compliance with all applicable mandatory requirements shall be recorded in the logbook.

(8) Where a certificate of fitness for flight is issued, the aircraft logbook shall be endorsed with the reason for its issue and a copy included in the logbook.

(9) A duplicate inspection certified in accordance with these Regulations shall be recorded in the appropriate log book except that, if made elsewhere such as in the technical Log, they may be cross-referred to in the log book.

49. Duplicate Inspection

(1) A duplicate inspection shall be carried out after any flight safety sensitive maintenance tasks involving the assembly or any disturbance of a control system that, when errors occur, could result in a failure, malfunction or defect endangering the safe operation of the aircraft.

(2) Duplicate inspections shall be carried out by at least two appropriately licensed aircraft maintenance engineers, to ensure correct assembly, locking and sense of operation and a technical record of the inspections shall contain the signatures of both licensed engineers before the relevant certificate of release is issued.

50. Records of maintenance

(1) A person who performs maintenance on an aircraft or aircraft component shall, for all maintenance work carried out, make an entry

in the maintenance record of the aircraft or aircraft equipment which shall include—

- (a) a description or reference to data acceptable to the authority of work performed including—
 - (i) the total time in service in hours, calendar time, and cycles, as appropriate; of the aircraft and all life-limited components;
 - (ii) the current status of compliance with all mandatory continuing airworthiness information;
 - (iii) appropriate details of modifications and repairs;
 - (iv) time in service in hours, calendar time, and cycles, as appropriate; since the last overhaul of the aircraft or its components subject to a mandatory overhaul life; and
 - (v) the current status of the aircraft's compliance with the approved maintenance program, and the detailed maintenance records to show that all requirements for signing of a maintenance release have been met;
- (b) completion date of the work performed; and
- (c) name, signature and licence number of the person approving the work.

(2) The signature under subregulation (1) (c) shall be deemed to be the approval for return to service in respect of the maintenance work performed.

(3) A person working under the supervision of a LAME shall not perform any inspection required by the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters)

Regulations, 2022 or any inspection performed after a major repair or modification.

(4) A person performing maintenance work referred to in subregulation (1) shall enter the records of any major repairs and major modifications, as specified by the authority in the applicable technical guidance material.

(5) A person performing major repairs or major modifications shall—

- (a) execute the form specified by the authority in the applicable technical guidance material at least in duplicate;
- (b) provide a signed copy of that form to the aircraft owner or operator; and
- (c) submit a copy of the form to the authority, in accordance with procedures for major repairs and modifications specified by the authority in the applicable technical guidance material, within forty eight hours after the aircraft or aircraft component is approved for return to service.

(6) Where an approved maintenance organisation performs major repairs or modifications, the organisation shall record the repairs or modifications undertaken, in the work order of the owner or operator of the aircraft.

(7) An approved maintenance organisation that performs major repairs or modifications shall—

- (a) give the owner or operator of the aircraft a signed copy of the work order and retain a duplicate copy for at least one year from the date of approval for return to service of the aircraft or aircraft component; and
- (b) give the owner or operator of the aircraft a certificate of release to service, duly signed by the appropriately qualified personnel in accordance with the Civil Aviation

(Personnel Licensing) Regulations, 2022 and the certificate shall include –

- (i) the identity of the aircraft or aircraft component;
- (ii) the make, model, serial number, aircraft nationality and registration marks and location of the repair on the aircraft;
- (iii) the name of the manufacturer, name of the part, model and serial number, if any, of an aircraft component; and
- (iv) the signature of the authorised representative of the approved maintenance organisation and the name, address and certificate number of the approved maintenance organisation.

51. Records of overhaul and rebuilding

(1) A person shall not record in a maintenance entry or form that an aircraft or aircraft component was overhauled unless the aircraft or aircraft component—

- (a) was disassembled, cleaned and inspected as may be permitted and was repaired as may be necessary, and reassembled using methods, techniques and practices acceptable to the authority; and
- (b) was tested in accordance with approved standards and technical data, or in accordance with current standards and technical data acceptable to the authority, and where the standards and data are developed and documented by the holder of the type certificate, supplemental type certificate, or a material, part, process, or appliance manufacturing approval, as the case may be.

(2) A person shall not record in any required maintenance entry or form that an aircraft or aircraft component was rebuilt

unless the aircraft or aircraft component was disassembled, cleaned and inspected as may be permitted and repaired as may be necessary and was reassembled and tested to the same tolerances and limits as a new item, using new parts or used parts, that conform to new part tolerances and limits.

52. Approval for return to service

(1) A person shall not approve any aircraft or aircraft component for return to service, where the aircraft or aircraft component has undergone maintenance, preventive maintenance, rebuilding or modification unless—

- (a) the appropriate maintenance record entry is made in accordance with these Regulations;
- (b) the major repair or major modification form authorised by the authority has been executed in a manner determined by the authority in the applicable technical guidance material;
- (c) where a repair or modification results in any change in the aircraft operating limitations or flight data contained in the approved aircraft flight manual, those operating limitations or flight data are appropriately established or revised as set out in regulation 7 based on the approved modification instructions.

53. Content, form and disposition of records for inspections

(1) A person who approves the return to service of an aircraft or aircraft component after an inspection performed in accordance with the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 shall make an entry in the maintenance record in respect of that aircraft or aircraft component which shall contain—

- (a) the type of inspection and a brief description of the extent of the inspection;
- (b) the date of inspection;
- (c) the aircraft total time and cycles in service;
- (d) the signature and licence number of the person approving the return to service of the aircraft or aircraft component; and
- (e) where, the aircraft is found to be airworthy and approved for return to service, a statement certifying that the aircraft has been inspected in accordance with the type of work and was determined to be in an airworthy condition.

(2) Where, as a result of defects, the aircraft is not approved for return to service because the aircraft needs maintenance or is not in compliance with the applicable specifications, airworthiness directives, or other approved data, a statement that the aircraft has been inspected in accordance with the inspection requirements and a list of discrepancies and unairworthy items, which shall be dated and provided to the aircraft owner or operator.

(3) Where, the inspection is conducted under an inspection program under the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 the person who performs the inspection shall make an entry identifying the inspection program accomplished, with a statement that the inspection was performed in accordance with the type of inspections and procedures for that particular program.

(4) A person who performs any inspection required under the Civil Aviation (Operation of Aircraft - Commercial Air Transport

Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 and determines that the aircraft is not airworthy or does not meet the applicable type certificate data sheet, airworthiness directives or other approved data upon which the airworthiness of the aircraft depends, shall give the owner or operator a signed and dated list of those discrepancies.

PART VIII—GENERAL

54. Extra- territorial application of Regulations to aircraft of the Government and visiting forces

(1) These Regulations apply to an aircraft, not being a military aircraft, which belongs to or which is exclusively employed in the service of the Government.

(2) For the purposes of subregulation (1) —

(a) the department or authority responsible for the management of the aircraft shall be deemed to be the operator of the aircraft; and

(b) in the case of an aircraft belonging to the Government, the department or authority responsible for the management of the aircraft shall be deemed to be the owner of the interest of the Government in the aircraft.

(3) Except as otherwise expressly provided, the naval force, military force and air force, a member of any visiting force and any property held or used for the purpose of any of these forces shall be exempt from the provision of these Regulations

55. Possession of licence, certificate, approval or authorisation

(1) A holder of a licence, certificate, approval or authorisation issued by the authority, shall have it in his or her possession or at the

work site, when exercising the privileges of that licence, certificate, approval or authorisation.

(2) A crew member of a foreign registered aircraft shall hold a valid licence, certificate, approval or authorisation and shall have physical possession of the licence, certificate, approval or authorisation issued by the authority or at the work site of the crew member, when exercising the privileges of the licence, certificate, approval or authorization, as the case may be.

56. Inspection of licences, certificates, approval or authorisation

A person who holds a licence, certificate, approval or authorisation required by these Regulations shall, upon request by the authority or a person authorised by the authority, present the licence, certificate, approval or authorisation for inspection.

57. Change of address

(1) A holder of a licence, certificate, approval, authorisation or other document issued under these Regulations shall notify the authority of—

- (a) a change in the physical address, at least fourteen days before the change; and
- (b) a change in the mailing address, upon the change.

(2) A person who does not notify the authority of the change in the physical address within the time frame specified in subregulation (1), shall not exercise the privileges of the licence, certificate, approval or authorisation.

58. Replacement of documents

A person to whom a document is issued under these Regulations, may, where the document is lost or destroyed, apply to the authority in writing for replacement of the document in accordance with the requirements and procedures determined by the authority in the specific circumstances.

59. Suspension, revocation and variation of licence, certificate, approval or authorisation

(1) The authority may revoke, suspend, or vary any licence, certificate, approval, authorisation or other document issued or granted under these Regulations, where it considers it to be in the public interest to do so.

(2) The authority shall revoke, suspend or vary any licence, certificate, approval, authorisation or other document issued or granted under these Regulations upon the completion of an investigation which shows sufficient grounds to the satisfaction of the authority.

(3) A holder of a licence, certificate, approval, authorization or any person who has possession or custody of a licence, certificate, approval, authorisation or other document issued under these Regulations, which is revoked, suspended or varied, shall surrender the certificate, licence, approval, authorisation or other document to the authority within fourteen days from the date of revocation, suspension or variation.

(4) The breach of any condition subject to which any licence, certificate, approval, authorisation or other document is granted or issued under these Regulations, shall render the document invalid during the continuance of the breach.

60. Use and retention of certificates and records

(1) A person shall not—

(a) use any licence, certificate, approval, authorisation or other document issued or required under these Regulations which is forged, altered, revoked, or suspended, or to which that person is not entitled;

(b) forge or alter any licence, certificate, approval, authorisation or other document issued or required under these Regulations;

(c) lend any licence, certificate, approval, authorisation or other document issued or required under these Regulations to any other person; or

(d) make any false representation for the purpose of procuring for that person or for any other person, the issue, renewal or variation of the certificate or other document.

(2) A person shall not—

(a) mutilate, alter, render illegible or destroy a record or any entry made in any record, required by or under these Regulations to be maintained;

(b) knowingly make, procure or assist in the making of any false entry in any record; or

(c) wilfully omit to make a material entry in any record during the period for which it is required under these Regulations to be made.

(3) A record required to be maintained by or under these Regulations shall be in a permanent and indelible form.

(4) A person shall not purport to issue any licence, certificate, approval, authorisation or other document for the purpose of these Regulations unless the person is authorised to do so under these Regulations.

(5) A person shall not issue any licence, certificate, approval, authorisation or other document required under these Regulations unless the person confirms that all statements in the licence, certificate, approval or authorisation are correct and that the applicant is qualified to hold that licence, certificate, approval or authorisation.

61. Reports of violation

(1) A person who knows of a violation of any provisions of these Regulations shall report the violation to the authority.

(2) The authority shall determine the nature and type of investigation or enforcement action required to be taken in respect of a report made under subregulation (1).

62. Enforcement of directions

A person who fails to comply with any direction given to him or her by the authority or by any authorised person under any provision of these Regulations commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points or a term of imprisonment not exceeding one year or both.

63. Aeronautical user fees

(1) The authority may charge fees for—

- (a) the issuance, validation, renewal, extension and variation of any licence, certificate, approval, authorisation or other document required under these Regulations;
- (b) for any examination, testing, inspection or investigation required under these Regulations; and
- (c) the grant of any permission or approval required under Regulations.

(2) The fees payable under subregulation (1) shall be paid to the authority at the time of making the application or request for which the fees are payable and shall not be refundable.

64. Offences and penalties

(1) A person who contravenes any provision of these Regulations may have the licence, certificate, approval, authorisation, exemption or other document issued to that person revoked or suspended by the authority.

(2) Where any provision of these Regulations is contravened in relation to an aircraft, the operator of that aircraft and the pilot-in-

command, if the operator or the Pilot-In-Command is not the person who contravened the provision shall, without prejudice to the liability of any other person under these Regulations for that contravention, be deemed for the purposes of these Regulations to have contravened that provision unless the operator and the Pilot-In-Command prove that the contravention occurred without their consent or connivance and that they exercised all due diligence to prevent the contravention.

(3) Where it is proved that an act or omission of any person, which would otherwise have been a contravention by that person of a provision of these Regulations, was due to any cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of that provision.

(4) Where a person is charged with contravening a provision of these Regulations by reason that the person was a member of the flight crew of an aircraft on a flight for the purpose of commercial air transport operations, the flight shall, with respect to that person, be treated as not having been for that purpose, where that person proves that he or she did not know or have reason to know that the flight was for commercial air transport operations.

(5) A person who contravenes any provision specified as a category “A” offence in Schedule 5 to these Regulations, commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points for each offence or to imprisonment for a term not exceeding two years or both.

(6) A person who contravenes any provision specified as a category “B” offence in Schedule 5 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points for each offence or imprisonment not exceeding four years or both.

(7) A person who contravenes any provision of these Regulations not referred to in Schedule 5, commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to imprisonment not exceeding one year or both and in the case of a second or subsequent conviction for the same offence, to a fine not exceeding two hundred currency points or imprisonment not exceeding eight years or both.

(8) An aircraft which is seized by and placed in the custody of the authority, under subregulation (7), shall be released where—

- (a) the fine is paid;
- (b) a bond of an amount prescribed by the authority is deposited with the authority, as a condition for the payment of the fine; or
- (c) a court makes an order to that effect.

65. Revocation of S.I. No 33 of 2020, savings and transitional

(1) The Civil Aviation (Airworthiness of Aircraft) Regulations 2020, are revoked.

(2) A licence, certificate, authorisation, or other approval granted by the authority under the Regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, or other approval under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Notwithstanding regulation 64 , a person granted a licence, certificate, authorisation or other approval, continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the licence, certificate, authorisation cancelled by the authority.

SCHEDULE 1

Regulation 2

Currency Point


A currency point is equivalent to twenty thousand shillings

SCHEDULE 2

Regulations 8, 9 and 10

REPUBLIC OF UGANDA

FORM: O-AWS002
July 2020

| CERTIFICATE OF AIRWORTHINESS | | |
|---|--|--|
|  | | Number: <input data-bbox="785 483 975 619" type="text"/> |
| UGANDA CIVIL AVIATION AUTHORITY | | |
| 1. Nationality and registration marks: | 2. Manufacturer and aircraft designation: | 3. Aircraft serial number: |
| 4. Category: | | |
| 5. Conditions: | | |
| <p>i. This Certificate is issued pursuant to the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 and the Convention on International Civil Aviation dated 7th December 1944 in respect of the above mentioned aircraft.</p> <p>(i) This Certificate shall remain valid only when the aircraft is maintained and operated in accordance with the approved program and pertinent operating conditions and limitations.</p> <p>(ii) The Aircraft Flight Manual or Pilot Operating Handbook is part of this Certificate and shall be carried on the aircraft at all times.</p> <p>(iii) A current Mass and Balance Schedule Report shall be carried on the aircraft at all time.</p> | | |

6. Limitations:

Minimum required crew:

Number of seats:

7. This Certificate, unless cancelled, suspended or revoked, is valid from.....to

Date of issue:

*Director Safety, Security and
Economic Regulation*

No entries may be made on this certificate except by an authorised person.

If the certificate is lost, the Director Safety, Security and Economic Regulation should be informed at the earliest possible opportunity.

If found, return the certificate to:

**Director Safety, Security and Economic Regulation,
Uganda Civil Aviation Authority P.O. Box 5536, Kampala.**

SCHEDULE 3

Regulations 43, 44 and 45

AIRCRAFT NOISE CERTIFICATION CLASSIFICATIONS PART A

The aircraft noise certification classifications in this Schedule are in accordance with the ICAO Annex 16, Volume I to the Chicago Convention (as amended)

| Annex Chapter | Details |
|----------------------|---|
| 2 | Subsonic jet aero planes – application for certificate of Airworthiness for the prototype accepted before 6 th October 1977 |
| | (a) all subsonic jet aero planes and propeller-driven aero planes, including their derived versions, with a maximum certificated take-off mass of 55 000 kg or over for which the application for a type certificate is submitted on or after 31 December 2018; |
| | (b) all subsonic jet aero planes, including their derived versions, with a maximum certificated take-off mass of less than 55000 kg for which the application for a type certificate is submitted on or after 31 December 2020; |
| | (c) all propeller-driven aero planes, including their derived versions, with a maximum certificated take-off mass of over 8618 kg but less than 55000 kg for which the application for a type certificate is submitted on or after 31 December 2020; and |
| | (d) all subsonic jet aero planes and all propeller-driven aero planes certificated originally as satisfying Annex 16, Volume I, Chapter 3, Chapter 4 or Chapter 5, for which recertification to Chapter 14 is requested. |
| 3 | 1. Subsonic jet aero planes – application for type certificate submitted on or after 6 th October 1977 but before 1 st January 2006. |

| | |
|----|---|
| | 2. Propeller-driven aeroplanes over not exceeding 8618 kgs – application for type certificate submitted on or after 1 st January 1985 but before 1 st January, 2006. |
| 4 | 1. Supersonic aeroplanes - application for certificate of airworthiness for the prototype accepted on or after 1 st January 2006 |
| | 2. Propeller driven aeroplanes of over 8,618 kg – application for certificate of airworthiness for the prototype accepted on or after 1 st January 2006 |
| 5 | Propeller-driven aeroplanes of over 5,700kg – application for certificate of airworthiness for the prototype accepted before 1 st January 1985 |
| 6 | Propeller-driven aeroplanes not exceeding 8,618kg – application for certificate of airworthiness for the prototype accepted before 17th November 1988 |
| 7 | Propeller driven STOL aeroplane. |
| 8 | Helicopters |
| 9 | Installed Auxiliary Power Unit (APU) and associated power systems during ground operations. |
| 10 | Propeller-driven aeroplanes not exceeding 8,618kg – application for certificate of airworthiness for the prototype or derived version accepted on or after 17th November 1988 |
| 11 | Helicopters not exceeding 3,175kg maximum certificated take off mass |
| 12 | Supersonic aeroplanes |
| 13 | Tilt-rotor aircraft - |
| | (a) a) The standards of this chapter shall be applicable to all tilt-rotors, including their derived versions, for which the application for a Type Certificate was submitted on or after 1 January 2018. |
| | (b) b) Noise certification of tilt-rotors which are capable of carrying external loads or external equipment shall be made without such loads or equipment fitted. |

| | |
|-----|---|
| 14. | The standards of this chapter shall, with the exception of those aeroplanes which require a runway length of 610 m or less at maximum certificated mass for airworthiness or propeller-driven aeroplanes specifically designed and used for agricultural or fire-fighting purposes, be applicable to- |
|-----|---|

- (a) all subsonic jet aeroplanes and propeller-driven aeroplanes, including their derived versions, with a maximum certificated take-off mass of 55 000 kg and over for which the application for a type certificate is submitted on or after 31st December, 2018;
- (b) all subsonic jet aeroplanes, including their derived versions, with a maximum certificated take-off mass of less than 55 000 kg for which the application for a type certificate is submitted on or after 31 December 2020;
- (c) all propeller-driven aeroplanes, including their derived versions, with a maximum certificated take-off mass of over 8 618 kg and less than 55 000 kg for which the application for a type certificate is submitted on or after 31st December, 2020; and
- (d) all subsonic jet aeroplanes and all propeller-driven aeroplanes certificated originally as satisfying Annex 16, Volume I, Chapter 3, Chapter 4 or Chapter 5, for which recertification to Chapter 14 is requested.

PART B—INFORMATION TO BE INCLUDED IN THE DOCUMENT ATTESTING NOISE CERTIFICATION

- 1. Name of State:
- 2. Title of document:
- 3. Number of document:
- 4. Nationality or common mark and registration mark:
- 5. Manufacturer and manufacturer’s designation of aircraft:
- 6. Aircraft serial number:

7. Engine manufacturer, type and model:
8. Propeller type and model for propeller-driven aeroplanes:
9. Maximum take-off mass and unit:
10. Maximum landing mass and unit for certificates issued:
11. Chapter and section of the Regulations according to which the aircraft is certificated:
2. Additional modifications incorporated for the purpose of compliance with the applicable noise certification standards:
13. The lateral/full-power noise level in the corresponding unit for documents issued:
14. The approach noise level in the corresponding unit for documents issued:
15. The flyover noise level in the corresponding unit for documents issued:
16. The overflight noise level in the corresponding unit for documents:
17. The take-off noise level in the corresponding unit for documents issued:
18. Statement of compliance:
19. Date of issuance of the noise certification document:
20. Signature of the officer who issues the noise certification document:

NOISE CERTIFICATE

Regulation 44

| | | | | | |
|---|---|---------------------------------|-------------------------------------|----------------------------|--|
| For use by State of Registry | | 1. <State of Registry > | | 3. Document number: | |
| | | 2. NOISE CERTIFICATE | | | |
| 4. Nationality | 5. Manufacturer and manufacturer's registration marks: designation of aircraft: | | 6. Aircraft serial number: | | |
| 7. Engine: | | 8. Propeller:* | | | |
| 9. Maximum take-off Mass: | | 10. Maximum landing mass:* | 11. Noise certification standard: | | |
| 12. Additional modifications incorporated for the purpose of compliance with the applicable noise certification Standards: | | | | | |
| 13. Lateral/full-Power noise noise level:* level:* | 14. Approach | 15. flyover | 16. Overflight noise level:* | 17. Take-off noise level:* | |
| Remarks: | | | | | |
| 18. This noise certificate is issued pursuant to Volume I of Annex 16 to the Convention on International Civil Aviation, in respect of the above-mentioned aircraft, which is considered to comply with the indicated noise Standard when maintained and operated in accordance with the relevant requirements and operating limitations. | | | | | |
| 19. Date of issue | | | | | |
| 20. Signature..... | | | | | |
| * These boxes may be omitted depending on the noise certification Standard. | | | | | |

SCHEDULE 4

Regulation 48

AIRCRAFT ENGINE AND PROPELLER LOG BOOKS

1. The entries to be made in the aircraft log book shall be—
 - (a) the name of the constructor, the type of the aircraft, the number assigned to the aircraft by the constructor and the date of construction of the aircraft;
 - (b) the nationality and registration marks of the aircraft; (c) the name and address of the operator of the aircraft;
 - (d) the date of each flight and the duration of the period between take-off and landing or if more than one flight was made on that day, the number of flights and the total duration of the periods between take-off and landings on that day;
 - (e) particulars of all maintenance work carried out on the aircraft or its equipment;
 - (f) particulars of any defects occurring in the aircraft or in any equipment required to be carried in the aircraft by or under the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 and of the action taken to rectify such defects including a reference to the relevant entries in the technical log required by the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022, and
 - (g) particulars of any overhauls, repairs, replacements and modifications relating to the aircraft or any equipment of the aircraft.
2. Notwithstanding paragraph 1 of this Schedule, entries shall not be required to be made under subparagraphs (e), (f) and (g) in respect of any engine or variable pitch propeller.
3. The entries to be made in the engine log book shall be—
 - (a) the name of the constructor, the type of engine, the number assigned to the engine by the constructor and the date of the construction of the engine;

- (b) the nationality and registration marks of the aircraft in which the engine is fitted;
 - (c) the name and address of the operator of the aircraft—
 - (d) either—
 - (i) the date of each flight and the duration of the period between take-off and landing or, if more than one flight is made on a day, the number of flights and the total duration of the periods between take-off and landings on that day; or
 - (ii) the aggregate duration of periods between take-off and landing for all flights made by that aircraft since, any maintenance, overhaul, repair, replacement, modification or inspection, whichever occurred last, was undertaken on the engine;
 - (e) particulars of all the maintenance work done on the engine;
 - (f) particulars of any defects occurring in the engine, and of the rectification of the defects, including reference to the relevant entries in the technical log required by the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022, and
 - (g) particulars of all the overhauls, repairs, replacement and modifications relating to the engine or any of the accessories of the engine.
4. The entries to be made in the variable pitch propeller log book shall be—
- (a) the name of the constructor, the type of the propeller, the number assigned to the propeller by the constructor and the date of construction of the propeller;
 - (b) the nationality and registration marks of the aircraft, and the type and number of each engine, to which the propeller is fitted;
 - (c) the name and address of the operator of each the aircraft to which the propeller is fixed;

- (d) either—
 - (i) the date of each flight and the duration of the period between take-off and landing or, if more than one flight is made on that day, the number of flights and the total duration of the periods between take-off and landings on that day; or
 - (ii) the aggregated duration of periods between take-off and landing for all flights made by that aircraft since any maintenance, overhaul, repair, replacement, modification or inspection, whichever occurred last, was undertaken on the engine;
- (e) particulars of all maintenance work done on the propeller;
- (f) particulars of any defects occurring in the propeller, and particulars of the rectification of the defects, including a reference to the relevant entries in the technical log required by the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022;
- (g) particulars of any overhauls, repairs, replacements and modifications relating to the propeller.

SCHEDULE 5

SUMMARY OF OFFENCES AND PENALTIES

| REG. NO. | TITLE | CATEGORY OF OFFENCE |
|----------|--|---------------------|
| 6 | Major modifications and repairs | A |
| 8 | Requirement of certificate of airworthiness | A |
| 18 | Airworthiness directives and service bulletins | A |
| 23 | Conditions on the special flight permit | B |
| 16 | Certificate of fitness for flight | A |
| 24 | Responsibility of maintaining airworthiness of aircraft | B |
| 25 | Continuing airworthiness information | A |
| 27 | Compliance with instructions of manufacturer | A |
| 28 | Reporting failure, malfunctions and defects | A |
| 31 | Persons authorized to perform maintenance, preventive maintenance and modification | B |
| 32 | Personnel authorized to approve for return to service | B |
| 33 | Persons authorized to perform inspections | B |
| 35 | Maintenance | A |
| 36 | Inspection | A |
| 40 | Airworthiness limitation performance rules | A |

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| 41 | Aircraft mass schedule | B |
| 43 | Requirements of noise certification | A |
| 46 | Keeping certificate of release to service records | A |
| 47 | Technical logbook | A |
| 48 | Aircraft, engine and propeller logbooks | A |
| 50 | Records of maintenance | A |
| 51 | Record of overhaul and rebuilding | A |
| 52 | Approval for return to service | A |
| 60 | Use and retention of certificates and records | B |
| 62 | Enforcement of directions | A |

Cross references

Civil Aviation (Air Operator Certification and Administration) Regulations, 2021 S.I. No. 73 of 2022

Civil Aviation (Approved Maintenance Organisations) Regulations, 2022.S.I. No. 78 of 2022

Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022 S.I. No. 75 of 2022

Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022 S.I No 84 of 2022

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 S.I. No. 86 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 S.I. No. 85 of 2022

Civil Aviation (Personnel Licensing) Regulations, 2022 S.I. No. 89 of 2022

Civil Aviation (Security) Regulations, 2022 S.I. No. 92 of 2022

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STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 88.

**THE CIVIL AVIATION (PERSONNEL LICENSING) (AIRCRAFT
MAINTENANCE ENGINEER'S LICENCE) REGULATIONS, 2022**

ARRANGEMENT OF REGULATIONS

Regulations

1. Title
2. Commencement
3. Interpretation
4. General eligibility requirements
5. Aeronautical knowledge and skill requirements
6. Experience requirements for licence with or without type rating
7. Privileges and limitations
8. Recency and renewal requirement

SCHEDULE

KNOWLEDGE AND SKILL REQUIREMENTS FOR AIRCRAFT MAINTENANCE ENGINEER'S LICENSING

STATUTORY INSTRUMENTS

2022 No. 88.

The Civil Aviation (Personnel Licensing) (Aircraft Maintenance Engineer’s Licence) Regulations, 2022

(Under sections 34(2) (c) and 61 of the Civil Aviation Authority Act, Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by section 61 of the Civil Aviation Authority Act, Cap. 354, and on the recommendation of the Civil Aviation Authority, these Regulations are made this 4th day of May, 2021.

1. Title

These Regulations may be cited as the Civil Aviation (Personnel Licensing) (Aircraft Maintenance Engineer Licence) Regulations, 2022.

2. Commencement

This Instrument shall be deemed to have come into force on the 5th day of February, 2020.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act.

4. General eligibility requirements

(1) An applicant for a grant of an aircraft maintenance engineer’s licence shall apply to the authority for the licence and shall—

- (a) be at least eighteen years of age;
- (b) demonstrate the ability to read, speak, write and understand the English language;

- (c) have completed an approved training in accordance with the Approved Training Organisation specified under the Civil Aviation (Approved Training Organisations) Regulations, 2022 or approved maintenance programme specified under the Civil Aviation (Approved Maintenance Organisations) Regulations, 2022;
- (d) comply with the knowledge, experience and competency requirements prescribed for the rating sought; and
- (e) be required to pass all of the prescribed examinations for the rating sought, within twelve months preceding the date of filing the application.

(2) A licensed aircraft maintenance engineer who applies for an additional rating shall meet the requirements of regulation 5.

5. Aeronautical knowledge and skill requirements

(1) An applicant for an aircraft maintenance engineer's licence shall demonstrate the level of knowledge and skill in the subjects as provided in the Schedule to these Regulations.

(2) The knowledge test results for an aircraft maintenance engineer's licence shall be valid for twelve months after passing the examination.

6. Experience requirements for licence with or without type rating

(1) Except as specified in subregulation (2), an applicant for the issuance or extension of a licence in categories A, C, X and R shall show confirmed minimum specific periods of aircraft maintenance engineering experience totaling 3 years.

(2) An applicant for Category 'X' – Compass Compensation and Adjustment shall hold a Licence Without Type Ratings in both Categories 'A' and 'C' or 'X' or 'R' and shall have a minimum of six months engineering experience relating to the maintenance of

operating an aircraft in the two years preceding the date of application with a minimum of six compass swings.

(3) An applicant under subregulation (1) shall demonstrate the following minimum experience gained while maintaining and operating an aircraft and not in component workshops or on static or non-flying aircraft—

- (a) for a Category ‘A’ or ‘C’ Licence Without Type Ratings, twenty four months relating to airframe or engine maintenance, twelve months of which shall be in the two years immediately preceding the date of application; or
- (b) for any Category ‘R’ or ‘X’ Licence Without Type Ratings (excluding Category ‘X’ – Compass Compensation and Adjustment), twenty four months related to avionics systems, twelve months of which shall be in the two years immediately preceding the date of application; and
- (c) six months, within the twelve months referred to in paragraphs (a) and (b), relevant to the specific Licence Without Type Ratings for which the application is being made.

(4) Where an applicant for category ‘X’ electrical holds a valid licence which includes both Category ‘A’ and Category ‘C’ Licence Without Type Ratings sub divisions, the experience in subregulation (3) (b) shall not be complied with and the applicant shall need to show only the six months experience relevant to the Licence Without Type Ratings required in subregulation 3(c).

(5) An applicant for a Licence Without Type Ratings in one category who holds a valid licence in another category, the experience under subregulations (3)(a) and (3)(b) may be reduced depending on the total practical experience accumulated while holding that licence and training attended but in any case shall demonstrate the experience requirements of subregulation 3(c).

(6) Any of the periods specified in this regulation may be concurrent.

(7) Subject to subregulation (8), the extension of a licence to include a type rating shall—

- (a) not require a period of general experience additional to that required for the relevant Licence Without Type Ratings, which shall be held before a type rating is granted; and
- (b) require satisfactory record of experience, gained within the three years before the application, appropriate to the type rating sought.

(8) An applicant for a type rating from a holder of a Licence Without Type Ratings which was gained following successful completion of an approved initial course shall show confirmed evidence that he has obtained at least twelve months relevant aircraft engineering experience with an organisation engaged in the maintenance of operational aircraft in addition to that gained during the course.

7. Privileges and limitations

(1) Except as specified in subregulations (4) and (5), a holder of an aircraft maintenance engineer licence may perform or supervise the maintenance, preventive maintenance or modification of or after inspection, approve for return to service, any aircraft, airframe, aircraft engine, propeller, appliance, component or part thereof, for which the holder of an aircraft maintenance engineer's licence is rated, provided the holder has—

- (a) satisfactorily performed the work at an earlier date;
- (b) demonstrated the ability to perform the work to the satisfaction of the authority;
- (c) received training acceptable to the authority on the tasks to be performed;

- (d) performed the work while working under the direct supervision of a holder of an aircraft maintenance engineer's licence or an aviation repair specialist who is appropriately authorised and has—
 - (i) previous experience in the specific operation concerned; or
 - (ii) received training acceptable to the authority on the task to be performed.

(2) Except as specified in subregulations (4) and (5), a holder of an aircraft maintenance engineer's licence with an airframe rating may, after he or she has performed the inspection required by the Civil Aviation (Operation of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft)(Commercial Air Transport)(General Aviation)(Helicopters) Regulations, 2022 and the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 on an airframe or any related part or appliance, approve and return the airframe or any related part or appliance to service.

(3) Except as specified in subregulations (4) and (5), a holder of an Aircraft Maintenance Engineer's Licence with an engine rating may perform the inspection required by the Civil Aviation (Operation of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 and the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 on an engine or propeller or any related part or appliance and approve and return the airframe or any related part or appliance to service.

(4) Except as specified in subregulation (5), a holder of an aircraft maintenance engineer's licence with a radio, electrical instruments, auto-pilot and compass rating may inspect, repair, maintain, function, test and return to service aircraft radio, electrical, instruments and compass systems and components respectively.

(5) A holder of an aircraft maintenance engineer's licence with an airframe, engine or radio, electrical, instruments and compass rating shall not supervise the maintenance, preventive maintenance or modification of or approve and return to service, any aircraft, airframe, engine, propeller, appliance, component or part thereof, for which the holder of an aircraft maintenance engineer's licence is rated unless the holder has satisfactorily performed the work concerned at an earlier date.

(6) Where the authority authorises an approved maintenance organisation to appoint a non-licensed personnel to exercise the privileges of regulation 6 (1) to (5), the person appointed shall meet the requirements specified in regulations 4 and 5.

8. Recency and renewal requirement.

(1) A holder of an aircraft maintenance engineer's licence shall apply for renewal of licence at least two months before the expiry of the licence in a form and manner prescribed by the authority.

(2) A holder of an aircraft maintenance engineer's licence shall perform work comparable with that required for the grant of the licence for periods totaling at least six months during the twenty four months preceding the date of the expiry of the licence.

(3) A person who fails to renew his or her licence after the expiry period may do so within the next twelve months provided that he or she proves that he has been continuously engaged in practical work for the entire extended period.

(4) A person who does not apply for a renewal within the extended period as provided for in subregulation (3) or fails to prove that he or she has continuously been engaged in practical work during that period shall be required to sit for an exam before his or her licence is renewed.

(5) A holder of an aircraft maintenance engineer's licence shall not exercise the privileges of the licence unless the licence is kept valid as prescribed by the authority.

SCHEDULE

Regulation 4(1)

KNOWLEDGE AND SKILL REQUIREMENTS FOR AIRCRAFT MAINTENANCE ENGINEERS LICENSING

1. The subjects relevant to the knowledge and skill requirements for all licence categories specified in regulation 4 are presented in this Schedule in a modular format.
2. The examinations for each category of licence, and its sub-divisions where appropriate, shall be based on a number of the Modules as indicated in the Module/Category relationship set out in the table below.
3. It will be noted that the modular arrangements recognise that major areas of the subjects are common to more than one licence category or its sub-divisions. Therefore, where an existing Licence requires to be extended to include another category or sub-division, those Modules that have been satisfied by previous examinations may be excluded.
4. Each module is numbered and contains a series of syllabus subject headings. Each subject is then further expanded in more detail against 'level numbers' corresponding to Licence Without Type Rating (LWTR) and Type Rating (TR). This expansion of detail provides an indication of the degree/level of knowledge, experience, competence and skill in aeronautical engineering required by the Regulations.
5. There are three level numbers and they are defined as follows -
 - (a) Level 1: General appreciation of principles and familiarization of the subject;
 - (b) Level 2: Comprehension of principles and salient features with a practical ability to assess operational condition; and
 - (c) Level 3: Detailed knowledge of all aspects of the subject.
6. In applying the above levels to the subjects which, in particular relate to aircraft, engines, systems and items of equipment, the following aspects shall be taken into account—
 - (a) theoretical principles;
 - (b) constructional arrangements, functional and design features;
 - (c) maintenance practices; and
 - (d) normal, deteriorated and failed conditions.

**TABLE: MODULE/CATEGORY RELATIONSHIP
MODULAR KNOWLEDGE AND SKILL SUBJECTS FOR
AIRCRAFT MAINTENANCE ENGINEER**

MODULE 1 REGULATIONS

| Syllabus Subject | Level | Details | |
|--|--------------|----------------|---|
| | WTR | TR | |
| Maintenance Engineers' Licences & Authorisations | 2 | - | Civil Aviation Regulations requirements |
| | | | Responsibilities: by statutory law and by the need to fly aircraft in a satisfactory condition, i.e. common, civil, or constitutional law |
| | | | Penalties – under statutory law and resulting from civil law suits |
| | | | Categories - applicability |
| | | | Areas and extent of limitations and privileges within categories |
| | | | Overlap of category applicability |
| | | | Relevant Airworthiness Notices and other Authority guidance manuals |
| Aircraft Registrations | 1 | 2 | International and national registration requirements |
| | | | Registration process |
| Certificate of Airworthiness | 1 | 2 | Issue of Certificate of Airworthiness requirements |
| | | | Categories of certificate of airworthiness and purpose of flight |
| | | | Prototypes, modified prototypes, series aircraft |
| | | | Renewal of certificate of airworthiness requirements and process |

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| Maintenance and Maintenance Records and Certification | 1 | 2 | Civil Aviation Regulations requirements and other applicable guidance material issued by the Authority |
| | | | Maintenance certification: certificate of release to service |
| | | | Duplicate inspections |
| | | | Contributory certifications and reliance on other documentation and persons |
| | | | Certification - acceptance investigation and judgment procedures |
| | | | Modification standards, process and recording |
| | | | Maintenance records – relevance of previous records |
| | | | Maintenance records – requirement to be kept, preservation and production |
| | | | Offences in relation to documents and records |
| | | | Inspection requirements and Standards' persons authorized |
| | | | Build Standards |
| | | | Maintenance responsibilities |
| Aircraft, engine and VP Propeller Log Books | 1 | 2 | Civil Aviation Regulations requirements and other applicable guidance material issued by the Authority |
| | | | Authority approval: Light aircraft, large aircraft |
| | | | Worksheet; technical log |
| | | | Data to be entered in technical log books |

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| | | | Condition reports – e.g. heavy landing checks, defect investigations, NDT and other inspections, mandatory and non-mandatory |
| | | | Maintenance checks and inspections |
| | | | Cross-reference to other files/records |
| | | | Preservation of documents; Civil Aviation Regulations requirements |
| Technical log | 1 | 2 | Civil Aviation Regulations requirements |
| | | | Technical Log – Air Operators Certificate Requirements |
| Aircraft Documentation and Requirements | 1 | 2 | Type certification and supplemental type certification |
| | | | Documents to be carried |
| | | | Flight manual – provision of manuals and aircraft performance |
| | | | Mass Schedule and aircraft loading |
| | | | External, and internal markings and signs, e.g. nationality and registration no smoking and fasten seat belt, placards and requirements, doors and exits |
| | | | Certificate of Airworthiness |
| | | | Certificate of registration |
| | | | Air Operators Certificate |
| | | | Instrument and Equipments |
| | | | Radio Station license and approval |
| | | | Change of ownership |
| | | | Aerial work, including parachuting, glider towing etc – certification |
| | | | Exits and break-in markings |

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| Approvals | - | 1 | Design organizations |
| | 1 | 2 | Approved maintenance Organization |
| | | | Maintenance Schedules/ programmes |
| | | | AOC and AMO interface |
| | | | 100 hours and annual inspections |
| | | | Aircraft parts stores requirements and management |
| Defect Reporting | 1 | 2 | Civil Aviation Regulations requirements |
| | | | Reportable occurrences (defects, incidents, accidents) |
| Authority Requirements | 1 | 2 | Manual of Airworthiness Requirements |
| | | | Airworthiness Notices |
| | | | Foreign airworthiness directives |
| Manufactures requirements | 1 | 2 | Service bulletins, manuals service letters etc |
| Foreign Authorities requirements | 1 | 2 | FAA, CAA (UK), JAR |
| ICAO Annexes requirements | 1 | 2 | Annexes 1, 6 and 8 |

Module 2 Basic Engineering Practices

| Syllabus Subject | Level | | Detail |
|--|-------|----|---|
| | VTR | TR | |
| Engineering Drawings and Technical Information | 1 | 2 | Drawing details-common practices: plan, elevations, isometric, sections, scale, dimensional and indicating presentation |
| | 2 | 2 | Use, validity control, interpretation |
| | 1 | 2 | Maintenance Manuals, Parts Catalogues, Overhaul Manuals |
| | | | Service bulletin and modification data |
| | | | Maintenance schedules: approved and otherwise |
| | 2 | 2 | Wiring diagram manuals, Interconnection charts, Schematic diagrams, Symbols |
| Mathematics | 1 | - | Simple calculations: measurements, angles, graphs, metric/imperial, volume, forces, moments, centre of gravity |
| | | | Transposition of formulae, Powers of numbers, Binary notation, Simple equations, Conversion of units |

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| | | | Resolution of forces |
| | 1 | - | Pressure/volume/temperature of gases |
| | | | Density, specific gravity, Pressure |
| | | | Hydraulics: basic principles, liquids in flow and static conditions |
| | | | The atmosphere-density/ pressure/temperature/ altitude/ humidity |
| | | | Basic principles of motion, acceleration, centrifugal, centripetal forces, friction |
| | | | Basic electrical laws, units, power in circuits, Magnetism, circuit calculation |
| Hangar/Workshop Common Practices and Tools | 1 | - | Lubrication methods and application |
| | | | Hand tools, simple machine tools |
| | | | Go/No Go gauges, fits and clearances |
| | 2 | 2 | Crimping tools, hand and hydraulic |
| | 1 | - | Precision measuring instruments, Electrical measuring instruments, Circuit testing methods |
| | 2 | - | Torque loading |

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| | 1 | - | Assessment of in service condition of soldered, brazed and welded joints |
| | 1 | - | Inhibiting and corrosion protection |
| | | | Painting and paint stripping |
| | 1 | - | Metal contamination |
| | | | Fire protection and safety in and around the workshop/ hangar/ aircraft |

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| | | | Storage and handling |
| Common Parts | 1 | 2 | Control cables and fittings |
| | | | Fastening devices – threaded, riveted and swaged |
| | | | V-band clamps and couplings |
| | | | Locking: parts and methods |
| | | | Washers |
| | | | Bearings |
| | | | Pipes: rigid and flexible |
| | | | Keys and key ways |
| | | | Worm drive and other types of band clips |
| Gases and Compounds | 1 | 2 | Air, nitrogen, carbon dioxide, oxygen, helium |
| | | | Acetylene |
| | | | Safety aspects |
| | | | Adhesives, oils, greases, sealing compounds, solvent |
| Basic Electrics | 2 | - | General principles and practices |
| | 2 | | Simple circuits a.c. to d.c., d.c. to a.c., a.c. to a.c. conversion |
| | 1 | 2 | Ground services ac and dc |
| | | | Batteries, application and handling |
| | | | Insulators and Insulation, Conductors and conductivity |
| | | | Common items used in aircraft applications, e.g. resistors, potentiometers, solenoids |

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| | | | Transformers, single phase and auto |
| | | | Semi-conductors, capacitors, relays |
| | | | Micro switches |
| | | | Proximity detectors |
| | | | Fuses, circuit breakers |

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| | | | Motors/actuators |
| | | | Principles of frequency wild, constant frequency a.c. power |
| | 1 | | Circuit wiring, connectors, crimping, clipping, cable sizes and types, cable looms, harnesses, terminations and disconnects |
| | | | Bonding, earthing of aircraft |
| | 1 | | Static electricity; lightning; static charges; 'interference' effects on radio equipment, electrostatic damage protection |
| Environmental Aspects | 1 | 2 | Effects of snow, ice, lightning and turbulence |

Module 3 Category ‘A’ Common – Aeroplanes, Rotorcraft and Airships

| Syllabus Subject | Level | | Detail |
|-----------------------|-------|----|---|
| | WTR | TR | |
| Basic Aerofoil Theory | 1 | 2 | Lift/thrust/drag/weight |
| | | | Stalling of an aerofoil |
| | | | Induced and parasitic drag |
| | | | Boundary layer |
| | | | Aerofoil shapes |
| | | | Chord/span/aspect ratio |
| Sub-Structures | 1 | 2 | Folded metal, sheet metal, extrusions, tubing |
| | | | Effect of swaging, lightening holes |
| | | | Use of different metals |
| | | | Commonly used fasteners and joint methods |
| | | | Protective treatments and precautions |
| | | | Honeycomb |
| | | | Reinforced plastic or epoxy materials, applications |
| | | | Floors |

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|-----------------------------------|---|---|--|
| | | | Seats – crew, passenger – ‘crash’ situation |
| | | | Aerials, Pilot probes, drain masts, air intakes and similar structural fitments. |
| | | | Instrument panels and consoles |
| | | | Radio equipment racks and stowages |
| Metals | 1 | - | Light alloys, iron and steel |
| | 1 | 2 | Titanium |
| | 1 | - | Brass, bronze, copper, lead |
| | 1 | 2 | Recognition and general characteristics of metals used |
| | | | Application and use of metals |
| | | | The purpose of heat treatments |
| | | | Use of different heat treated materials |
| | | | Anodic treatments |
| | | | Corrosion treatments during manufacture |
| | | | Identification of corrosion |
| | 2 | 2 | Corrosion treatments during repair |
| | | | Fatigue |
| | | | Other protective treatments or finishes |
| Non-destructive Condition-Testing | 1 | - | Typical uses and display of defects using: |
| | | | X ray/gamma ray, ultrasonic, eddy current, magnetic particle |
| | 2 | - | Penetrant leaching |
| | 1 | 2 | Visual probes |
| | | | Eyeglass equipment: usefulness, effectiveness of various magnifications |

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| Materials – non Metal Reinforced Plastics/ Epoxy Composites | 1 | 2 | Glass, fibre and filament reinforcement |
| | | | Materials used |
| | | | Cold setting, hot setting systems |

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|-------------------------|---|---|--|
| | | | Construction principles used, aircraft applications |
| | | | Failure characteristics |
| | | | Honeycomb, foam sandwich |
| Hydraulic | 2 | - | Simple systems, i.e. powered pump, reverse selection, pressure relief, pressure regulation LP AND HP filters |
| | 1 | 2 | Types of pump |
| | | | Differing fluids – mineral/fire resistant |
| | | | Control and indication methods |
| Landing Gear and Brakes | 1 | 2 | Wheels, tyres, shock absorbers, castering, steering methods |
| | 2 | - | Simple hydraulic brakes, i.e. master cylinder to wheel-brake unit |
| | 1 | 2 | Brake discs and callipers |
| | 1 | - | Landing and braking energy conversion |
| Electrical | 1 | 2 | Simpler type systems |
| | 1 | 2 | Batteries, generators, relays, wiring, switch gear |
| | | | Voltage control |
| | | | Current limiting, circuit protection devices |
| | | | Paralleling |
| | | | a.c. from inverters |
| | | | Crimping |

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|----------------------------------|---|---|---|
| | | | Soldered joints |
| | | | Control and indications, magnetic indicators and annunciators |
| Instruments (other than Engines) | 1 | 2 | Pitot or static systems and associated instruments |
| | | | Gyro instruments – vacuum, pressure, or electrical |
| | | | Pressure and temperature Indication |
| | | | Position indication |

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|------------------|---|---|--|
| | | | Compasses |
| Radio | 1 | - | VHF communication systems |
| Safety Equipment | 1 | 2 | Fire extinguishers – hand |
| | | | Life jackets |
| | | | Life rafts |
| | | | Seat belts or harnesses-passenger or crew 3-point, 4-point, inertial, lapstraps |
| | - | 3 | Mandatory requirements for upper torso restraint |
| Ground Handling | 1 | 1 | Jacking, trestling, slinging, towing, tie down |
| | | | ‘Servicing’ activities |
| | | | Storage |
| | | | Painting – protective finish or external markings |
| | 1 | 2 | Weighing and centre of gravity determination – weighing report |
| | | | Civil Aviation Requirements e.g. Airworthiness Notices, manual of Airworthiness Requirements |
| | | | Scale position |
| | | | Basic Weight |
| | | | Unusable fuel |
| | | | Oil and other consumable liquids - quantities |
| | | | Role variations |
| | | | Hold, seat row, removable equipment |
| | | | Station identification |
| | | | C of G datum |

MODULE 4(A)

CATEGORY ‘A’ – AEROPLANES

| Syllabus Subject | Level | | Details |
|------------------------------|-------|----|--------------------------|
| | WTR | TR | |
| Theory of Flight and Control | 1 | 2 | Stability and control |
| | | | Equilibrium |
| | | | Stalling of the aircraft |

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| | | | Flaps and slats |
| | | | Aerodynamic balance |
| | | | Mass balance |
| | | | Aileron, elevator, rudder control |
| | | | Tabs – servo/anti-servo, balance, anti- balance, trim or spring |
| | | | Canard or foreplanes |
| Aircraft Structures | 1 | 2 | Main structures - fuselage or wing |
| | | | Stressed skin – diaphragms and longerons |
| | | | Tubular structures |
| | | | Skin, frames, and stiffening |
| | | | Wing: spar and rib structures |
| | | | Integral fuel tanks |
| | | | Load paths |
| | | | Empennage |
| | | | Windows, doors and hatches |
| Refurbish/'Overhaul' of Aircraft | 1 | 2 | Preparation of the aircraft– cleaning, access dismantling, jacking and trestling, furnishing removal |

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| | | | Preparation of inspection reports and establishment of work required |
| | | | Final inspection – preparation of final reports and records/log book entries |
| | | | Mandatory modifications, Inspections, Service bulletins, Airworthiness Directives applicable to the type rating sought |
| Overhaul/Repair of Parts/ components | 1 | 2 | Overhaul data – requirements, documentation, work sheets, inspection stages, testing |
| | | | Use and control of workshop inspection aids including non- destructive test equipment |

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| | | | Factors and limitations affecting choice of equipment and methods used |
| | | | Overhaul and testing procedures for component parts of pneumatic, hydraulic, air conditions, oxygen, anti-icing, de-icing, fire extinguishing and rotorcraft transmission systems |
| | | | Assembly procedures and approved repair schemes applicable to major components |
| | | | Engine mounting structures |
| | | | Inspections necessary before, during and after repair, including checking of alignment and symmetry |
| | | | Repair, inspection and testing of tanks, heat exchangers, fuel and oil systems, and all types of control systems relevant to the Licence category sought |
| Facilities | 1 | 2 | Preparation and layout of workshops |
| | | | Care, use and checking for accuracy of test equipment |
| Welding | 1 | 2 | Use and application |
| | | | Approved welders – limitations, periodic testing |
| | | | Supporting – pre-heating – pressure relief |
| | | | Cleaning and preparation |
| | | | Fluxes and filler or welding rods |
| | | | Gas and specialist welding principles |
| | | | Materials |

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| | | | Strength of welded joints |
| | | | Inspection before, during and after welding |
| | | | Pre-and post-treatments |
| | | | Equipment |

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|-------------------------------|---|---|---|
| Brazing/hard Soldering | 1 | 2 | Use and application |
| | | | Support, pre-heating, pressure relief |
| | | | Cleaning and preparation |
| | | | Fluxes – fillers/spelter |
| | | | Materials |
| | | | Equipment |
| Materials – non Metal: | | | |
| (1) Wood | - | 2 | Types, application and uses |
| | | | Diseases – environmental effects |
| | | | Plywoods |
| | | | Glues – past and present |
| | | | Storage and condition control |
| | | | Damage-failure modes |
| | | | Painting/protective finishes |
| (2) Fabrics | - | 2 | Natural and man-made materials – types, applications and used |
| | - | 1 | Techniques used during covering |
| | - | 2 | Repairs |
| | | | Paint finishes and protective treatments |
| | | | Butrate and nitrate paints |
| | | | Ageing |
| | | | Tautening, heat shrinking |

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| | | | Strength considerations |
| | | | Drainage and apertures |
| | | | Stitching, stringing, adhesives |
| | | | Testing |
| Systems: | | | |
| (1) Flight Controls | 1 | 2 | Aileron, elevator rudder |
| | | | Operating systems and surfaces – manually operated |
| | | | Trim operating systems and surfaces – manual and electric |
| | | | Flap systems – electrical, hydraulic and manual |
| | - | 2 | Flap systems – pneumatic |

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| | 1 | 2 | Simple asymmetric protection |
| | | | Slat systems – automatic, and manual |
| | - | 2 | Hydraulic |
| | 1 | 2 | Tab systems – trim, balance, servo, anti- servo, anti-balance, spring servo |
| | | | Stall sensing and warning – simple systems, e.g. vane or reed types |
| | | | Basic auto pilots – simple systems |
| | | | Inputs into main controls-function testing – attitude, heading and height sensing |
| (2) Ice and Rain Protection | 1 | 2 | Liquid, electric and boot systems |
| | | | Power source, control and indication |
| | | | Windscreen wipers |

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| | - | 2 | Electrically-heated wind-screens |
| (3) Heating and Ventilation | 1 | 2 | Combustion heaters, exhaust heat exchangers |
| | | | Ram air |
| | | | Ventilation fans |
| (4) Oxygen | 1 | 2 | Bottle storage, distribution, regulation |
| | | | Masks |
| | 2 | - | Safety features and requirements |
| (5) Pressurisation | 1 | 2 | Simple systems – bleed air, turbo-charger bleed |
| | | | Passenger environmental requirements for the control of: oxygen, heating, ventilation, rate of change, humidity |
| | | | Mass flow control |
| | 1 | 2 | Temperature control |
| | | | Differential pressure – maximum, negative |
| | | | Control and indication |
| | | | Cabin structure, windows and doors for pressurised flight |
| (6) Vacuum/Pressure | 1 | 2 | Dry and wet pump systems |
| | | | Oil separation |
| | | | Gyro supply |
| | | | Relief valve |
| | | | Filtering |
| | | | Aerofoil anti-icing |
| (7) Pneumatic | - | 2 | Landing gear or flaps/brakes |
| | | | Operating systems |
| | | | Basic theory and common practices |

MODULE 4(B)

CATEGORY ‘A’ – AEROPLANES

| Syllabus Subject | Level | | Details |
|------------------------------|-------|--|--|
| | WTR | TR | |
| Theory of Flight and Control | 1 | 2 | Transonic effects, swept wings, wing fences, spoilers, high lift devices vortex generators |
| | | | High speed stall |
| | | | Shock wave |
| | | | Speed of sound-mach numbers |
| | | | Work turbulence |
| | - | 2 | Supersonics – sound waves |
| | | | Delta wing forms |
| | | | Kinetic heating |
| | | | C of G control |
| | | 1 | 2 |
| Aircraft Structures | | | Management systems – general principle |
| | 1 | 2 | Fail-safe application |
| | | | Fatigue effects and control |
| | | | Wing: box or integral tank construction |
| | | | Pressure-loaded skin, bulk-heads, windows, windscreens, doors |
| | | | Milling or chemical etch constructed structure |
| | | | Bonded type construction |
| | | Fasteners-close tolerance | |
| | | Sealing compounds | |
| | | Maintenance programmes-structural survey | |

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| | | | NDT programme |
| | | | Large aircraft paint and protective Finishing processes |
| | | | Cargo holds |
| | | | Venting and draining |
| | | | Sound proofing |
| M | | | |
| Furnishings | 1 | 1 | Upholstery |
| | | | Toilet and galley partitioning |
| | | | Carpets and Curtains |
| | | | Particle boards and plastic laminates |
| | 1 | 2 | Fire resistance/escape requirements |
| | | | Passenger seats |
| | | | Crew seats – cabin and flight crew |
| Systems: | | | |
| (1) Flight Control | 1 | 2 | Powered controls |
| | | | Spoiler, air or speed brake, lift dump |
| | | | Lift augmentation-LE droop, slats or flaps |
| | | | Flap operating systems – large transport aircraft |
| | | | Flap asymmetric and alternate operation |
| | | | Stall sensing-stick shake |
| | - | 2 | Stick push/nudge |
| | - | 1 | Electronic control system |
| | 1 | 1 | Fly by wire |

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| (2) Hydraulic | 1 | 2 | Variable delivery systems |
| | | | Accumulator or cut-out dependent system |
| | | | Pressure or volume control |
| | | | Pressure-reducing valves |
| | | | Fire-resistant fluids-temperature, contamination, compatibility |
| | | | Pressurised reservoirs |
| | | | Multiple system provision |
| | | | Alternate systems-HYRAT or hyd-raulic motors |
| | | | Electrically-powered and air-driven systems |
| | | | Leak protection systems – system isolation, ‘fused’ systems, priority control |
| | | | Internal leakage – cause and effects –acceptability |
| (3) Landing Gear | 1 | 2 | Multiple axles and wheels |
| | | | Bogey beams |
| | | | Door sequencing |
| | | | Main and alternate brake provision |
| | | | Anti-skid system-electronic and mechanical-aquaplaning |
| | | | Landing gear unsafe protection |
| | | | Alternate lowering |
| | | | Weight on or weight off sensing |
| | | | Fire protection |
| | | | Powered steering–retraction self centring |
| | - | 2 | Auto braking |
| (4) Pneumatic (ATA 36) | 1 | 2 | Bleed air pneumatic systems |
| | | | Systems supplied |

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| | | | Bleed air valves |
| | | | Mass, flow, pressure and temperature control and indication |
| | | | Ducting |
| | | | Leak detection |
| | | | Alternate supply-APU and ground cart |
| (5) Ice and Rain Protection | 1 | 2 | Mainplane or tail hot air anti-ice systems |
| | | | Control and indication |
| | | | Leak/overheat-detection or protection |
| | 1 | 2 | Ice detection |
| | | | Rain repellent |
| | | | Windscreen wipers |
| | | | Laminated windscreen heating |
| | | | Waste water discharge |
| | | | Pilot/static sensors |
| (6) Environmental and passenger Systems: - | | | |
| 6.1 Air Conditioning | 1 | 2 | Cabin blower or bleed air supply |
| | | | Heat exchangers |
| | | | Cold air units or air cycle machines |
| | | | Vapour cycle systems |
| | | | Humidity control systems |
| | | | Mass, flow, pressure and temperature control and indication |
| | | | Leakage detection and protection |
| | | | Ventilation requirements |
| | | | Passenger service unit air supply |
| | | | Water extraction |

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| | | | Recirculation |
| 6.2 Pressurisation | 1 | 2 | Outflow control - electric, electronic and pneumatic |
| | | | Maximum differential and negative pressure control |
| | | | Cabin altitude and rate of change |
| | | | Emergency dump and manual control |
| | | | Ditching |
| | | | Cabin altitude and rate of change |
| | | | Entrance or access or baggage door sealing and locking, indications and warnings |
| 6.3 Oxygen | 1 | 2 | Storage, distribution and charging |
| | | | Drop-out system |
| | | | Chemical systems |
| | | | Therapeutic provision |
| | | | Masks – passenger or crew or smoke |
| | 1 | 3 | Bottle checks and precautions |
| 6.4 Toilets, Waste and Water, Galley Services | 1 | 1 | Toilets: servicing provision |
| | 1 | 2 | Toilet flushing systems – pump over – heat protection |
| | | | Water – washing, hot or cold, potable |
| | | | Potable water – health protection |
| | | | Pressure control |
| | | | Water heating systems – safety provisions |
| | | | Waste collection and drainage |
| | | | Galleys-refrigerators, food and drink, ice – health protection |
| | | | Lifts, safety factors |
| | | | Catering trolleys |

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| 6.5 Baggage | 1 | 2 | Automatic systems-pallets and containers |
| | | | Restraint and securing |
| | | | Dangerous goods |
| 6.6 Entertainment and Passenger service | 1 | 1 | Films, video, television and audio |
| | | | Public address |
| (7) Electrical | 1 | 1 | 3-phase a.c. power generation systems - Control and protection Transformer rectifier units Cables and terminators |
| | | | Basic electronics-hardware – printed circuit boards |
| | | | Built-in testing provisions |
| | | | Static inverters |
| | - | 1 | Multiplex – basic principles |
| | 1 | 1 | Logic – basic principles |
| (8) Instruments | 1 | 1 | ADI, HSI representation and ground functioning |
| | | | Altitude encoding and transponder systems – general |
| | | | Computer inputs |
| | | | Centralised air data units |
| | | | CRT displays |
| | | | Flight recorders – voice recorders |
| | | | INS |
| (9) Equipment, Safety | 1 | 2 | Slide, rafts, dinghies |
| | | | Portable oxygen |
| | | | Loud hailers |
| | | | Smoke masks or hoods |
| | | | Survival equipment |
| | | | Notices or placards |

Module 6 Category ‘C’ –Piston Engines in Aeroplanes, Rotorcraft and Airships

| Syllabus Subject | Level | | Details |
|--------------------------|-------|----|--|
| | WTR | TR | |
| Principles, Terminology | | | |
| Definitions and Laws | 1 | 2 | Normally aspirated and super-charged operation |
| | | | Two and four stroke cycles |
| | | | Ignition timing, mixture, fuel grade detonation. |
| | | | Power |
| | | | Overhaul periods or continuation in service beyond overhaul recommendation |
| | | | Ground running – principles and problems |
| | | | Effect of altitude, humidity, temperature and icing |
| | | | Standard atmosphere, pressure altitude |
| | | | Fixed and variable pitch propeller effects |
| | | | Vibration characteristics and damping |
| | | | Type certification |
| Engine overhaul: General | 2 | - | Overhaul as a condition control process – its advantages and disadvantages |
| | | | Familiarity with the operating environment of piston engines in aircraft |
| | | | Sudden stoppage – over-revving, over-boosting, over-heating |
| | | | Bogus parts |

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| | | | Fatigue |
| | | | Mandatory reporting |
| | | | Fuels and oils – Mogas |
| Overhaul Process Control | 2 | - | Facilities: shop layout – stores; work environment; equipment for cleaning, inspection, rework and testing |
| | | | Control of precision measuring instruments and equipment |
| | | | Work package control and processing |
| | | | Acceptability of third party work/opinions/reports/recommendations e.g. manufacturers and their agents/other agencies |
| | | | Use of experts and expert opinion |
| | | | Use of unskilled labour |
| Constructional Arrangement and Piston Engine General Consideration | 1 | 1 | General arrangement – internal |
| | 1 | 2 | General arrangement - external |
| | | | Crankcase breathing |
| | | | Propeller shaft sealing |
| | | | Propeller attachment provision material |
| | | | Power take-off provision |
| | | | Cooling |
| | | | Cylinders, pistons and valve gear |
| | | | Hydraulic tappets |
| | | | Camshaft |
| | | | Casings, mountings and accessories drive |

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| | | | Vibration damping |
| | | | Crankshaft, balance weights, main bearings |
| | | | Auxiliary drives, internal lubrication provisions |
| | | | Seals and sealing materials |
| | | | Oil coolers and thermostatic valves |
| | | | Oil pumps, filtering, pressure control |
| | | | Fuel pumps – engine driven |
| | | | Ignition and valve timing provision |
| | | | Drive pulleys |
| | | | Hardness testing, fits and clearances Dowels and blind holes |
| | | | Sequential torque assembly– retorquing requirements |
| | | | Tooth patterns and backlash checks |
| | | | Contact area checking |
| | | | End float clearance, checking and setting |
| | | | Bonding and main earthing |
| Repairs and rectification | 1 | 1 | Machining |
| | | | Heat treatment |
| | | | Anodic treatments |
| | | | Plating |
| | | | Corrosion treatments |
| | 2 | 2 | Protective treatments and finishes |
| | | | Surface finishes |

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| | | | Fits and clearances |
| | | | Thread forms |
| Overhaul activity | 1 | 2 | Cylinder and piston assemblies |
| | | | Cooling baffles – hottest cylinder |
| | | | Main casings |
| | | | Rear covers |
| | | | Gear trains |
| | | | Camshaft and valve operating mechanisms |
| | | | Crankshaft,connecting rods–bearings |
| | | | Lubrication systems–passages, jets, pumps, pressure relief valves, coolers, thermostatic valves, filters and strainers |
| | | | Sealing-slinger rings, and mechanical flow control |
| | | | Crank cases, rear covers, sumps |
| | | | Engine mounting provisions |
| | | | Governor drive provision |
| | | | Induction and exhaust manifolds |
| | | | Reduction gears, assemblies and housings |
| | | | Superchargers or turbochargers |
| | | | Carburettor/injection systems |
| | | | Hoses and pipes |
| | | | Electrical wiring |
| | | | Ignition harness |
| Non-Destructive Testing | 2 | - | Eddy current, ultrasonic, X-ray or gamma ray, magnetic particle |
| | | | Techniques – status and approval |

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| | | | Approved NDT organisations |
| | | | Interpretation of results |
| | | | Certification of inspection completion or acceptability of the condition found |
| Welding/Brazing | 2 | - | Preparation – flux- welding or brazing es, rods |
| | | | Expansion, contraction effects and control |
| | | | Hollow parts – internal protection |
| | | | Welding methods: gas, arc, resistance welding |
| | | | Brazing and hard soldering methods |
| | | | Approval of welders |
| | | | Inspection of welded or brazed joints |
| Release, Preservation, Storage and Transportation | 2 | - | Log Books: certification, reports, references, recording of parts, limits, concessions, modifications, alternate parts, mandatory modifications and inspections |
| | | | Service information leaflets, etc |
| | | | Lifed parts, salvage schemes or oversized parts |
| | | | Inhibiting: internal, external, injectors, carburettors, turbochargers |
| Systems: | | | |
| (1) Carburetor and induction | 1 | 2 | Air intake – normal or alternate – filtering |
| | | | Manifolds |
| | | | Anti-icing provision |
| | | | Float type and injection systems |
| | | | Engine driven fuel pumps |

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| | | | Priming systems |
| | | | Mixture, idle cut-off or throttle control |
| (2) Ignition | 1 | 2 | Magnetos |
| | | | Ignition harness |
| | | | Spark plugs – reach variations, operating temperature – long life |
| | | | Switch control |
| | | | Timing (internal or external) |
| | | | Advancing and retarding mechanisms |
| | | | Screening |
| | | | Starting aids – impulse couplings and ignition boosting |
| (3) Starting | 1 | 2 | Starter motors – manuals, Bendix, solenoid, pre-engaged – engagement methods |
| | | | Non-engagement indication and effects |
| | | | Starter relays |
| | | | Earth straps |
| | | | Cooling |
| | | | Effects on battery |
| (4) Fire Protection and Indication | 1 | 2 | Extinguishant, bottles, cartridges, ‘life control |
| | | | Detection systems and warnings |
| | | | Two shot provision |
| (5) Lubrication | 1 | 2 | Wet and dry sump systems |
| | | | System arrangement |
| | | | Pressure control |
| | | | Effects of hot and cold weather |
| | | | Filtering |

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| | | | Straight, detergent, ash dispersant oils |
| | | | Engine condition assessment using oil system analysis |
| | | | Oil coolers- temperature control |
| | | | Hoses, rigid pipes, internal passages, splash – oil jet |
| | | | Cooling functions of the oil system |
| (6) Supercharging/ Turbocharging | 1 | 2 | Directly driven and exhaust drive superchargers |
| | | | Manual and automatic control |
| | | | Lubrication and hydraulic power |
| | | | Controls and indication |
| | | | Automatic control systems |
| (7) Aircraft Fuel | 1 | 2 | Tanks, cells and integral systems |
| | | | Fuel tank heating and monitoring |
| | | | Venting |
| | | | Fuel pumps – electrical |
| | | | Fuel grades and quality |
| | | | MOGAS |
| | | | Water contamination – drains |
| | | | Filtering |
| | | | Controls and indication |
| (8) Engine Controls | 1 | 2 | Throttle |
| | | | Electronic controls |
| | | | Mixture |
| | | | Propeller |
| | | | Alternate air |
| | | | Manual controls for turbocharger |

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| (9) Engine Instruments | 1 | 2 | Manifold pressure |
| | | | Rotational speed |
| | | | Pressure and temperature |
| | | | Cylinder head temperature |
| | | | Exhaust gas temperature |
| | | | Electronic Condition Monitoring |
| (10) Diagnostic Tools | 1 | 2 | Equipment |
| | | | Use and analysis |

Module 7 Category ‘C’ – Fixed and Variable Pitch Propellers

| Syllabus Subject | Level | | Details |
|---|-------|----|---|
| | WTR | TR | |
| Principles, Terminology, Definitions and Laws | 1 | - | Constant Speeding |
| | | | Pitch variation |
| | | | Ground and flight functioning characteristics |
| | | | Power conversion |
| | | | Blade forces: aerodynamic and centrifugal |
| | | | Aerofoil aerodynamic principles |
| | | | Pitch coarse/fine, high/low, reverse |
| | | | Feathering |
| | | | Vibration characteristics |
| | | | Turbine engine installation propeller systems |
| Constructional Arrangement | 1 | 2 | Pitch change mechanism single/double acting |
| | | | CSUs or governors |
| | | | Spinners |
| | | | Balance control |
| | | | Materials |
| | | | Diameter – minimum and maximum |
| | | | Pitch stops – fixed, centrifugal, manual and electrical |
| | | | Protective finishes – contour control |
| | 1 | 3 | Damage acceptance areas |
| | | | Cropping |

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| | 1 | 2 | Attachment and assembly methods |
| | | | Oil transfer – governor, propeller or sump |
| | | | Safety visibility |
| Automatic and Manual Pitch Control Systems | 1 | 2 | Pilot control and governor sensing |
| | | | Feathering |
| Ice Protection | 1 | 2 | Liquid and electrical systems |
| Turbine Engine Application | 1 | 2 | Auto-feathering |
| | | | Synchronising or synchrophasing |
| | | | Braking |
| | | | Automatic and manually controlled pitch limiting systems |
| | | | Beta control |
| | | | Permitted balancing |

Module 8 Category ‘C’ – Turbine Engines in Aeroplanes, Rotorcraft and Airships

| Syllabus Subject | Level | | Details |
|--|-------|----|--|
| | WTR | TR | |
| Principles, Terminology Definitions and Laws | 1 | 2 | Gas flow path – temperature, velocity and pressure |
| | | | Compression |
| | | | Combustion |
| | | | Turbine Power extraction |
| | | | Effects of atmospheric variations in temperature, density, pressure altitude on engine and on engine or aircraft combination |
| | | | Single shaft, two and three shaft engines |
| | | | Centrifugal and axial flow compressors |
| | | | Fan engines |
| | | | By-pass engines |
| | | | Water or water methanol injection |
| | | | Power turbines |
| | | | Surge or compressor stalling |
| | | | Propeller turbines |
| | | | Gas producers |
| | | | APU applications |
| | | | Thrust reversal |
| | | | Power assessment |
| Constructional Arrangement | 1 | 2 | Casings, shafts, bearings, accessories drive |
| | | | Air intakes and compressors |
| | | | Combustion section |

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| | | | Turbines and exhaust |
| | | | Materials |
| | | | Modular construction |
| | 1 | 3 | Engine inspection capability and condition assessment provision |
| | 1 | 3 | Principles of ‘condition monitored’ and ‘on condition’ maintenance programmes |
| | - | 2 | Supersonic flight air intake geometry control systems |
| Propeller and Shaft Power Provision | 1 | 2 | Gas producers |
| | | | Reduction gearing |
| | | | Power and auxiliary drive |
| | | | Rotational speed and power control, safety systems |
| | 1 | 1 | Principles of torque, power, rotational speed in power transmission by rotating shafts |
| Systems: | | | |
| (1) Thrust Reversing | 1 | 2 | General arrangements |
| | | | Control/interlocks |
| | | | Safety features |
| | | | Operating systems – hydraulic/pneumatic mechanical |
| | | | Turbine and fan applications |
| (2) APUs | 1 | 2 | General arrangements |
| | | | Intake and exhausts systems – door operation |
| | | | Load control |
| | | | Electrical output control and management |
| | | | Speed control |

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| | | | Fuel control |
| | | | Safety features |
| | | | Ground, flight or altitude-limiting factors |
| | | | Mounting |
| | | | Fire protection and indication |
| | | | Bay cooling |
| | | | Ground running |
| (3) Fuel Control | 1 | 2 | Principles – parameters |
| | | | Mechanical or electronic control |
| | | | Power speed – control and limiting |
| | | | Temperature and power factors |
| | | | Burners–primary and secondary provision |
| | - | 2 | Burners–shaft injection, torch ignition |
| | 1 | 2 | Governor speed sensing |
| (4) Fuel Systems | 1 | 2 | Tanks – cells and integral systems |
| | | | Refueling/defuelling, crossfeed, jettison, venting, transfer |
| | | | Scavenging – jet pumps |
| | | | Boost pumps, backing pumps |
| | | | LP or HP valves and control |
| | | | Tank selection |
| | | | Internal or external pipes, hoses, connectors |
| | | | Fuel types |
| | | | Static electricity–effects and control |
| | | | Leak assessment and control |
| | | | Fuel quantity indication – ‘LevelSticks’ |

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| | | | Water contamination – effects and control |
| | | | SG, Density, volume or weight |
| | | | Filtering and heating |
| | | | Fuel systems in pressurized cabin areas |
| (5) Water Injection | 1 | 2 | Water or water methanol applications |
| | | | Sensing, control and safety provision |
| | | | Power effects |
| | | | Tankage |
| | | | Replenishing or dumping |
| | | | Pumps |
| | | | Effects on fuel control |
| | | | Pipes and pipe lines |
| (6) Lubrication | 1 | 2 | Tanks, storage, venting, contents indication |
| | | | Pressure or scavenge pumps |
| | | | Filters, screens and magnetic plugs/chip detectors |
| | | | Pressure or flow control |
| | | | Heat exchangers oil, fuel, oil or air |
| | | | Sealing-labyrinth seals, carbon seals, etc. |
| | | | Overboard drains – drains systems |
| | | | Lubrication of mains bearings, accessories and gear trains |

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| | | | Supply to propeller systems |
| | | | Contamination by hydraulic fluid or fuel |
| | | | Types of oil |
| | | | Internal or external pipes, hoses and passages – effects of heat |
| | | | Use of oil for ice protection – intake and fuel control |
| (7) Cooling, Sealing and Bleed Air Services | 1 | 2 | Internal cooling, external cooling, sealing air |
| | | | Overboard dump – temperature monitoring |
| | | | Off-takes for other services – air conditioning, anti-icing, equipment drive, pressurizing of hydraulic reservoirs, water systems, etc. |
| | | | Centrifugal filters |
| (8) Surge Protection and Airflow Control | 1 | 2 | Bleed valves – operating systems |
| | | | Variable inlet guide vanes – scheduling, operating systems |
| | | | Surge sensing |
| | | | ‘Surge margins’ |
| | - | 2 | Supersonic flight air intake geometry control |
| (9) Ice Protection | 1 | 2 | Hot air systems–struts and intakes |
| | | | Electrical systems – engine and intakes |
| | | | Use of oil and air bleeds |
| | | | Pressure sensor heating |
| | | | Control and indication |
| (10) Fire Protection | 1 | 2 | Fire detection |
| | | | Overheat warning |
| | | | Fire extinguishing |
| | | | Bay and zone isolation |

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| | | | Fire walls, bulkheads, cladding |
| | | | Fire wires, detector units |
| | | | Single/dual detection |
| | | | Extinguishants |
| | | | First and second shot capability |
| | | | Warnings and indications – lights, aural warnings, fuse types, squib test |
| | | | ‘Bottle gone’ indicators |
| | | | Operating systems |
| | | | Over pressure |
| | | | Cartridges – life control |
| | | | Electric and electronic systems |
| (11) Ignition | 1 | 2 | High energy ignition systems |
| | - | 2 | Torch ignition |
| | | | Glow plug systems |
| | 1 | 2 | Igniter plugs and leads |
| | | | Operation inside and outside the starting cycle |
| (12) Starting | 1 | 2 | Starting cycle |
| | | | Initiation – HP valves, termination, bleed valves, starter valves, power lever, self sustaining speeds |
| | | | Starter motors – electrical, pneumatic, starter/generators – HP air, impingement air |
| | | | Clutch provision, overspeed sensing |
| | | | Manual operation starter cooling/ resting |
| | | | Ground power electrical/ pneumatic provisions |
| (13) Controls | 1 | 2 | Power/throttle/thrust reverse |

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| | | | HP/LP valve controls – manual and electric |
| | | | Condition control systems |
| | | | Propeller control |
| | | | Auto control of throttle |
| | | | Control runs |
| | - | 1 | Electronic control systems |
| (14) Pods, Pylons, Cowlings and Mountings | 1 | 2 | General arrangements |
| | | | Services and controls – input/exit |
| | | | Materials |
| | | | Venting |
| | | | Zone demarcation |
| | | | Mountings |
| | | | Pylon and pod structural features |
| | | | Torque, vibration, expansion provisions |
| | | | Bay venting |
| | | | Cooling air intakes |
| (15) Electrical | 1 | 2 | a.c. generators – CSDs/IDGs |
| | | | Starter/generators |
| | | | Starter motor high current circuits |
| | | | CSDs – principles of operation, disconnect/ reconnect, lubrication/ hydraulic operation, filters, coolers |
| (16) Instruments | 1 | 2 | Rotational speed indication; a.c. generator and pulse probe systems |
| | | | Temperature and pressure systems |
| | | | Pressure ratio systems |

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| | | | Turbine temperature systems |
| | | | Instrument system amplifier |
| | | | Fuel flow indication |
| | | | Torque indication |
| | | | Fuel contents/oil contents- electrical and electronic |
| | | | Vibration indication |
| Ground Handling | 1 | 2 | Storage and inhibiting |
| | | | Spare engine carriage |
| | | | Ground running – noise control –power checking |
| | | | Functional checks of engine associated services |

Module 9 Category ‘A’ & ‘C’–Rotorcraft

| Syllabus Subject | Level | | Details |
|------------------------------|-------|-------------|---|
| | WTR | TR | |
| Theory of and Flight Control | 1 | 2 | Rotor disc: forces acting, lift, drag centrifugal force, weight, rotor useful force, phase lag; advance angle non- constant speed drive (Hookes Joint) effect |
| | | | Articulate/ semi-rigid/ rigid rotors |
| | | | Flapping/ dragging/ feathering |
| | | | Climbing/losing height/ horizontal flight |
| | | | Main and anti-torque rotors– control inputs–cyclic and collective |
| | | | Effects of aircraft speed on rotors |
| | | | Directional control |
| | | | Translational lift/inflow/ground effect |
| | | | Vortex ring effect |
| | | | Retreating blade stall |
| | | | Reverse flow |
| | | | Auto-rotation; auto-rotative force/ blade section |
| | | | Auto-rotation rev/min |
| - | 2 | Twin rotors | |
| Constructional Arrangements | 1 | 2 | Rotorcraft structures, load paths, vibration effects |
| | | | Landing gear configurations: skids/ wheels/ floats |
| | | | Fuselages, tail cones, pylons, engine mounts |
| | | | Gearbox and transmission mountings |
| | | | Doors and windows |

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| Systems: | | | |
| (1) Flying Controls | 1 | 2 | Collective/cyclic/directional |
| | | | Hydraulic |
| | | | Rotor heads – main and tail rotor |
| | 1 | 2 | Articulated, rigid, semi-rigid, teetering |
| | | | Swash plate/spider control input methods |
| | | | Blades: construction and materials; balancing: static, dynamic, span wise, chord wise |
| | | | Tracking: flag and in-flight methods |
| | | | Tabs/trailing edge bending |
| | | | Vibration – effects and analysis |
| | | | BIM indicators |
| | | | Automatic Pilots/Autostabilisers –Control interface |
| | | | System components – component replacement and subsequent testing |
| (2) Ice and Raid Protection | 1 | 2 | Windscreen wipers |
| | | | Electrically-heated windscreens |
| (3) Heating and Ventilation | 1 | 2 | Exhaust heat exchangers |
| | | | Ram air |
| | | | Ventilation fans |
| Transmission systems | 1 | 2 | Engines to rotors: shafts, clutches, freewheel units; reduction gearboxes; main transmission/ gearboxes, combining gearboxes |

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| | | | Tail rotor drive: drive shafts, intermediate gearboxes, tail rotor gearboxes |
| | | | Lubrication systems: oils, coolers, cooling fans, filters, magnetic plugs, chip detectors, pumps, pressure control |

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| | | | Universal drive provision |
| | | | Splined shafts, type of gears – tooth pattern |
| | | | Instrumentation |
| | | | Rotor brake systems |
| Equipment | 1 | 2 | Hoists and winches |
| | | | External load carrying |
| | | | Flotation |
| | | | Survival systems |
| | | | Specialised role equipments, aerial spraying, cameras |
| Instruments | 1 | 1 | ADI, HIS |
| | | | Flight recorders |
| | 1 | 2 | HUMs |

Module 10 Category ‘A’ & ‘C’– Airships

| Syllabus Subject | Level | | Details |
|------------------------------|-------|----|--|
| | WTR | TR | |
| Principles of Lift | 1 | - | Bodies immersed in fluids |
| | | | Gases: free to expand/constant volume/constant temperature/constant pressure |
| | | | Mixture of gases in a containing vessel |
| | 2 | - | Centre of gravity, centre of buoyancy, static heaviness, static lightness, static trim |
| | | | Ballonet ceiling, pressure height |
| | | | Superpressure |
| | | | Superpressure, superheat |
| | | | Porosity |
| | | | Equilibrium |
| | | | Ballast-shot/water |
| Theory of Flight and Control | 1 | - | Aerodynamic lift, aerodynamic balance |
| | | | Stability and control |
| | | | Free ballooning |
| | | | Fins, rudders, elevators |
| | | | Tabs: balance/servo/trim/spring |
| | | | Powered flying controls |
| Envelope | 2 | - | Materials: fabrics, Kevlar |
| | 1 | - | Ultra-violet light effects |
| | | | Gas-tight membranes |
| | | | Ballonets, gases, load curtains, shear curtains, support cables, gas valves, air valves, entry ports, inspection domes, charge adaptors, load patches, handling lines, nose cone |
| | | | Charging, purging, porosity checks |

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| | | | Lightning protection |
| | | | Airs systems: ram air scoops, balloonet fans, dampers, transfer fans |
| Gondola | 2 | - | Main Structures |
| | | | Materials: Kevlar laminate, fibrelam, sandwich panels, metal skin frames and stiffening |
| | 1 | - | Moulding/bonding techniques |
| | | | Support cables, support cable attachment, bulkheads, equipment attachment |
| | | | Furnishings |
| | | | Doors, windows and hatches |
| | | | Fire protection – skinning |
| | | | Lightning protection |
| Systems: | | | |
| (1) Flight control | 1 | - | Fins, rudders, elevators |
| | | | Operating systems and surfaces –manually/power operated |
| | | | Trim operating systems – manual and electric |
| (2) Ice and Rain Protection | 1 | - | Windscreen wipers |
| (3) Heating and Ventilation | 1 | - | Exhaust heat exchanges |
| | | | Ventilation system |
| (4) Vacuum/Pressure | 1 | - | Supply and associated system |
| (5) Landing Gear | 1 | - | Geometric arrangement |
| | | | Structural arrangement |
| | | | Castering/pivoting/locking |
| | | | Shock absorbers |
| | | | Weight sensing/measurement |
| Ducted Propellers | 1 | - | Principles of operation |

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| | | | Propeller forces: aerodynamic/centrifugal |
| | | | Pitch variation/control |
| | | | Positive/negative vectoring |
| | | | Power conversion |
| | | | Control systems: electronic control, emergency forward coarse selection |
| | | | Balance |
| | | | Clutches |
| | | | Materials |
| | | | Protective finish: contour control, visibility |
| | | | Duct pivoting systems: drive and control, motors, limit control, gear boxes, inter-connection, emergency manual |
| Ground Handling | 1 | - | Attaching to/releasing from/mast |
| | | | Ground power |
| | | | Fuelling |
| | | | Ballasting |
| | | | Helium: charging, purifying, leak testing |
| | | | Pressure watch techniques |
| | | | Mooring – mobile/portable |
| | | | Engine running |
| | | | Hangaring |
| | | | Adverse weather |

Module 13 Human Performance

| Syllabus Subject | Level | | Details |
|-----------------------------------|-------|----|--|
| | WTR | TR | |
| General | 2 | | The need to take human factors into account |
| | | | Incidents attributable to human factors/ human error |
| | | | 'Murphy's' Law |
| Human Performance and Limitations | 2 | | Vision |
| | | | Hearing |
| | | | Information processing |
| | | | Attention and perception |
| | | | Memory |
| | | | Claustrophobia and physical access |
| Social Psychology | 1 | | Responsibility: individual and group Motivation and de-motivation |
| | | | Peer pressure |
| | | | 'Culture' issues |
| | | | Team working |
| | | | Management, supervision and leadership |
| Factors Affecting Performance | 2 | | Fitness/health |
| | | | Stress: domestic and work related |
| | | | Time pressure and deadlines |
| | | | Workload: overload and underload |
| | | | Sleep and fatigue, shiftwork |
| | | | Alcohol, medication, drug abuse |
| Physical Environment | 1 | | Noise and fumes |

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| | | | Illumination |
| | | | Climate and temperature |
| | | | Motion and vibration |
| | | | Working environment |
| Tasks | 1 | | Physical work |
| | | | Repetitive tasks |

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| | | | Visual inspection |
| | | | Complex systems |
| Communication | 2 | | Within and between teams |
| | | | Work logging and recording |
| | | | Keeping up to date, currency |
| | | | Dissemination of information |
| Human Error | 2 | | Error models and theories |
| | | | Types of error in maintenance tasks |
| | | | Implications of errors (i.e. accidents) |
| | | | Avoiding and managing errors |
| Hazards in the Workplace | 2 | | Recognizing and avoiding hazards |
| | | | Dealing with emergencies |

Module 21 Basic: Electrical Equipment and Systems

| Syllabus Subject | Level | | Details |
|---------------------------|-------|----|---|
| | WTR | TR | |
| Batteries | 1 | - | Principles of primary and secondary cells |
| | 2 | - | Lead-acid types |
| | | | Ni-Cad types |
| | 2 | 3 | Methods of charging batteries in aircraft |
| | 2 | - | Capacity testing, storage |
| Direct Current Machines | 2 | - | Basic laws and principles |
| | | | Types and characteristics |
| | | | Control |
| Direct Current Generation | 1 | 2 | Voltage regulation |
| | | | Control |
| | | | Load sharing |
| | | | Paralleling |
| | | | System layout |
| | | | Interlock circuits |

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| Power Conversion Equipment | 1 | 2 | Static and rotary inverters |
| | | | Transformer rectifier units |
| Fire Protection | 1 | 2 | Detection systems |
| | | | Fire and overheat warning |
| | | | Smoke detectors – principles and applications |
| | | | Overheat sensors |
| | | | Extinguishing systems |
| | | | Warnings |

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| Flight Controls | 1 | 2 | Motors and actuators – clutches and brakes |
| | | | Limit switches, micro switches and proximity detectors |
| | | | Power control units |
| | | | Flap motors protection and control |
| | | | Trim motors |
| Fuel Systems | 1 | 2 | Boost pumps control and indication |
| | | | Jettison systems |
| | | | Refuel/defuel systems |
| | | | Fuel heaters |
| | | | Crossfeed, supply and shut-off valves-normal and emergency |
| Hydraulic Systems | 1 | 2 | Pump control and isolation |
| | | | Pressure switches |
| | | | Overheat warnings |
| | | | Electrically-operated priority valves |
| | | | Fluid reservoir components |
| | | | Low level warnings |
| Landing Gear Systems | 1 | 2 | Actuation motors – selection and control |
| | | | Indication – proximity sensors microswitches |
| | | | Air/ground sensor systems |
| | | | Anti-skid systems – operation, control and override |
| | | | Automatic braking systems – inputs; control and override |
| Lighting Systems | 1 | 2 | External systems: landing, navigation, anti-collision and inspection, etc. |

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| | | | Internal systems: normal and emergency, fluorescent tubes, reading and passenger information systems, multiplex function |
| Pneumatics | 1 | 2 | Control–indication and protection |
| Engine and Propeller Control | 1 | 2 | Fuel control valves |
| | | | Temperature and speed limiting systems |
| | | | Propeller feathering controls |
| | | | Electronic engine control |
| Starting and Ignition | 1 | 2 | System types |
| | | | Control |
| | | | Principles of operation of high energy ignition units |
| | | | Aircraft and engine applications and related systems, e.g. stall warning |
| Alternating Current Machines | 2 | - | Basic laws and principles |
| | | | Types and characteristics |
| | | | Control |
| Alternating Current Power Generation | 1 | 2 | Constant and variable frequency |
| | | | Constant speed drive units |
| | | | Paralleling |
| | | | Load sharing |
| | | | Load shedding |
| | | | Generator control unit |
| | | | Voltage regulation |
| | | | Load controller |
| | | | Differential protection |

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| Alternating Current Power Distribution Systems | 1 | 2 | Bus-bar layouts |
| | | | Split and parallel systems |
| | | | Transfer relay interlocks |
| | | | Emergency conditions |
| | | | APU and GPU interlocks |
| | | | Warnings |
| | | | Maintenance panels |
| Air Conditioning Systems | 1 | 2 | Control |
| | | | Indication |
| | | | Protection |
| Ice and Rain Protection Systems | 1 | 2 | Windscreen heating: control, indication and failure |
| | | | Engine/propeller and airframe anti-ice protection: thermal, electrical and pneumatic |
| | | | Warnings and indications |
| | | | Overhead indications and protection |
| | | | Ground operations |
| | | | Windscreen wiper, washer and rain repellent systems |
| | | | Sensor protection – angle of airflow, pitot head, static plate and temperature probes |
| | | | Waster water heaters – thermal anti-icing protection |
| | | | Aerial heaters |

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| Auxiliary Power Units | 1 | 2 | Starting, control, protection |
| | | | Power generation |
| | | | Fire protection |
| Ground Power Supplies | - | 2 | Interlocks and protection of aircraft supplies |
| | | | Control |
| Centralised Warning and Indication Systems | 1 | 2 | Inputs |
| | | | Output warnings |
| | | | Priority philosophy |
| Galley/Toilet Services | 1 | - | Power supply and protection |
| | | | Water heating |
| | | | Equipment |
| | | | |

Module 22 Basic: Instruments Category ‘X’

| Syllabus Subject | Level | | Details |
|--------------------------------------|-------|----|--|
| | WTR | TR | |
| Pitot-Static Systems and Instruments | 1 | - | Atmospheric physics, temperature lapse rate, Mach number computation |
| | 2 | - | Airspeed indicator, altimeter, vertical speed indicator, and machmeter |
| | | | Servo altimeter |
| | 1 | 2 | Pitot probes, static plates and heaters |
| | 2 | 2 | Pipelines and flexible hoses |
| | 1 | 2 | Drain straps, associated equipment |
| | | | Altitude and airspeed switches |
| Rate of Turn and Slip Indication | 1 | 2 | Rotor speed; display |
| Vacuum System | 1 | - | Sources |

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| | 1 | 2 | Control and adjustment |
| | | | Indication |
| Pressure Measurement | 1 | - | Sensing elements; capsules, bellows, Bourdon tubes, transmitters |
| | | | Displays |

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| Temperature Measurements | 1 | 2 | Variable resistance |
| | | | Thermocouplers; compensation, limits and values; servo indicators; control system inputs |
| Rotational Speed Measurement | 1 | 2 | Direct drive indicators; tacho-generator and indicator systems; pulse probe systems |
| | | | Displays |
| Position Measurement | 1 | 2 | d.c. and a.c. systems |
| Quantity Measurement | 1 | 2 | Direct reading |
| | 2 | 2 | Electrical and electronic systems |
| | 1 | 2 | Compensation |
| | | | Power supplies |
| Flow Measurement | 1 | 2 | Indicators |
| | | | Transmitters |
| | | | Power supplies |
| Compasses | 1 | 2 | Direct reading compass installation; safe distance |
| | | | Flux detectors and remote sensors remote system components |
| | | | Heading reference outputs |
| Air Data Computation | 2 | - | Sensors and inputs |
| | | | Signal processor: mechanical, electrical and electronic |
| | | | Signal outputs and displays |

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| Reduced Vertical Separation Minima | 1 | 2 | Signal sources and interface with other systems |
| | 1 | 2 | Maintenance practices |
| Flight Path Computation | 2 | 2 | Signal sources, radio inputs |
| | 1 | 2 | Modes, computation |
| | | | Displays |
| Electronic Display Systems | 1 | 1 | CRT; LED; LCD displays |
| | 1 | 2 | EADI; EHSI; symbol generators |
| | | | Control panels |
| | | | Comparators and monitors |

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| | | | Engine indicating and crew alerting systems |
| | | | Electronic centralised aircraft monitors |
| Flight Data Recorders | 1 | 2 | Requirements |
| | 1 | 2 | Sensors and inputs |
| | | | Cockpit Voice Recorder inputs |
| | | | Interface with aircraft systems |
| | | | Signal processing |
| | | | Entry panels |
| | | | Computer principles |
| | | | Data recording methods |
| | | | Retrieval and verification |
| | 1 | 1 | Readout |
| | 1 | 2 | Failure monitors |
| Inertial Navigation Systems and Inertial Reference Systems | 1 | 1 | Basic principles |
| | | | Platform construction |
| | | | Computation |

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| | 1 | 2 | Displays and interface with aircraft equipment |
| | | | Mode selector and CDU |
| | | | Failure/fault indicators |
| | | | Power supplies and cooling |
| Ground Proximity Warning Systems | 2 | 2 | Modes |
| | | | Warnings |
| | 1 | 2 | Inputs and interface with other aircraft systems |
| | 1 | 1 | Computation |
| | | | Monitors |
| | | | Failure indications |
| Vibration Measurement | 1 | 2 | Types of pick up |
| | | | Signal conditioning |
| | | | Displays |
| | | | Alarm levels and warnings |

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| Compass Compensation | 1 | - | Base survey techniques |
| | | | Compass swinging areas |
| | | | Aircraft magnetism |
| | | | Terrestrial magnetism – variation |
| | | | Methods and procedures for swinging compasses |
| | 3 | - | Deviation: calculations and effects on a compass |
| | | | Compensation and adjustment procedures |
| Digital Flight Systems | 1 | 1 | Flight management systems |

Module 23 Basic Gyroscopes and Servomechanisms Category ‘X’

| Syllabus Subject | Level | | Details |
|-------------------|-------|----|---|
| | WTR | TR | |
| Gyroscopes | 1 | - | Basic principles |
| | 1 | 2 | Types and methods of operation – vacuum, electrical, or laser |
| | 2 | - | Handling care |
| Electronics | 1 | 2 | Transistors |
| | | | Biasing, simple circuit arrangements |
| | 1 | 2 | Amplifiers |
| | | | Signal amplifiers, feedback |
| Attitude sensing | 1 | 2 | Errors, correction |
| | | | Remote gyros, interconnection and transfers |
| | | | Limits |
| Direction sensing | 1 | 2 | Errors, compensation |
| | | | Remote gyros, interconnection and transfers |
| Rate sensing | 1 | 2 | Alignment |
| | | | Rotor speeds |
| Accelerometers | 1 | 2 | Basic principles |
| Synchros | 1 | 2 | CTs, Differential, Torque synchros and resolvers |

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| Servomechanisms | 1 | 2 | Rate and position sensing and control |
| | | | Integrators |
| | | | Response and damping |
| | | | Power requirements |
| | | | Clutches |
| | | | Override and lockout protection |

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| | | | Null and loop error sensing |
| | | | Synchronisation systems |
| | | | Force rebalance systems |
| Digital Techniques | 2 | | Logics – basic gate functions and truth tables |
| | 1 | | Microprocessors – block diagram |
| | | | Digital computing techniques |
| | | | Parallel and series operation |
| | | | Volatile/non-volatile data storage |
| | | 2 | Multiplex systems |
| High Intensity Radiated Fields (HIRF) | 1 | 1 | Effect on sensitive systems, principles and methods used to minimize HIRF effects |
| Fly by Wire | 1 | 1 | General principles |

Module 24 Automatic Pilots - Aeroplanes Category ‘X’

| Syllabus Subject | Level | | Details |
|-------------------------------|-------|----|---|
| | WTR | TR | |
| Theory of Flight (Fixed Wing) | 1 | 2 | Forces on the aircraft |
| | | | Stability – dihedral, sweepback, etc |
| | | | Control axis |
| | | | Primary control surfaces – operation and effect on the aircraft |
| | | | Secondary controls |
| | | | Forces during turns |
| | | | Functions of trim tabs, balance tabs and servo tables |

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| | | | High speed buffet and stall conditions |
| | | | Auto-pilot control axis |
| | | | Auto-stabilisers – wing levelers |
| | | | Co-ordinated turns, aileron/rudder cross feed |
| | | | Versine generation and application |
| | | | Sideslip monitors – Slip and skid in a turn |
| | | | Turbulence penetration and the effect on autopilot control |
| Yaw Dampers | 1 | 2 | Dutch Roll phenomenon |
| | | | Yaw sensing |
| | | | Yaw signal processing |
| | | | Synchronisation |
| | | | Series and parallel systems |
| | | | Cockpit indication |
| | | | Aileron/rudder control interaction in turns |
| | | | Rudder PCU, LRUs |
| | | | Interlocks with autopilot systems |
| Pitch Trim Systems | 1 | 2 | Longitudinal axis stability |
| | | | High speed tuck |
| | | | Mach No. inputs |
| Mach Trim | 1 | 2 | Mach trim actuators computation |
| | | | Connections with aircraft controls |
| | | | Warnings |
| Alpha Trim | 1 | 2 | Angle of attack sensing |
| | | | Computation |

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| | | | Interface with other aircraft systems: e.g. N1 computers – stall warning systems |
| | | | Flight directors |
| Auto-Stabilisers | 1 | 2 | Trim actuators – control and safety interlocks |
| | | | Speed change systems for trim actuators |
| | | | Interlocks |
| | | | Elevator/stabiliser interaction |
| C of G Trimmers | 1 | 2 | Computation |
| | | | Indication |
| Demand Signals | 1 | 2 | Control wheel steering systems |
| | | | Touch wheel steering systems |
| Automatic Throttle Systems | 1 | 2 | Control input |
| | | | Related engine controls |
| | | | Sensors |
| | | | Engine coupling units: clutches and servo-motors |
| | | | Override and safety considerations |
| | | | Modes of operation |
| | | | Electronic engine control: microprocessor inputs and control |
| Automatic Landing Systems | 1 | 2 | Principles, requirements and approach categories |
| | | | Types of systems operation: dual or triple channel |
| | | | System operation on approach |
| | | | Monitors and failure conditions |
| | | | Roll-out control |
| | | | BITE |

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| | 1 | 3 | Category downgrade and reinstatement procedures |
| Digital Flight Systems | 1 | 2 | Flight management systems |

Module 25 Automatic Pilots – Common - Category ‘X’

| Syllabus Subject | Level | | Details |
|------------------|-------|----|--|
| | WTR | TR | |
| Error Signals | 1 | 2 | Rate system – errors and control |
| | | | Displacement system – errors and control |
| | | | Heading and course error inputs |
| | | | Radio beam deviation inputs |
| | | | Attitude inputs |

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| | | | CADC/autopilot interface – e.g. q or % adaptation |
| | | | Sideslip sensors and monitors |
| Signal Processing | 1 | 2 | Typical channel signal flow path |
| | | | Buffer amps |
| | | | Input signal modulation |
| | | | Summing points |
| | | | Signal sensors and switching functions |
| | | | Integrators |
| | | | Limiters |
| | | | Gain programmes |
| | | | Dual channel monitors |
| | | | Voter systems |
| Demand Signals | 1 | 2 | Mode selectors |
| | | | Control display units |
| | | | Turn controllers |
| | | | Control column transducers |
| | | | Command override systems |

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| | | | Mode compatibility |
| | | | Mode annunciators |
| | | | Failure and disconnect lights and aural warnings |
| | | | Interlocks – pre and post-engage |
| | | | Pitch attitude trim |
| | | | Roll out/heading-hold, engage |
| | | | Synchronisation |
| | | | Trim monitors and indicators |
| | | | Altitude hold inputs |
| | | | Vertical speed control |
| | | | Mach/IAS hold |
| | | | Altitude acquire or change systems |
| Command Signal Outputs | 1 | 2 | Power control units – line replaceable units |
| | | | Solenoid valves |
| | | | Transfer valves |
| | | | Position sensors |
| | | | Servomotors-construction,inter-connection with control runs |
| | | | Clutches – torque settings |
| | | | Brakes |
| | | | Tachogenerators –feedback and damping |
| | | | Position feedback - indication |
| | | | Torque limiting |
| | | | Hardover sensing – disconnection |
| | | | Jam detection |
| | | | Runway conditions – disconnection |
| | | | Pilot override - disconnection |

Module 26 Automatic Pilots – Rotorcraft- Category ‘X’

| Syllabus Subject | Level | | Details |
|--------------------------------|-------|----|---|
| | WTR | TR | |
| Theory of Flight (Rotorcraft) | 1 | 2 | Rotor disc: forces, lift, drag, centrifugal force, weight, phase lag |
| | | | Articulated/ semi-rigid/ rigid rotors flapping/ dragging/ feathering |
| | | | Vertical and translational flight |
| | | | Main and anti-torque rotors, control inputs cyclic, collective, rudder pedals |
| | | | Directional control |
| | | | Autorotation |
| | | | Forward speed effects |
| Command Outputs | 1 | 2 | Actuators |
| | | | Indicators |
| Trim Systems | 1 | 2 | Manual/Automatic |
| | | | Indication |
| Stability Augmentation Systems | 1 | 2 | Actuators |
| | | | Indicators |
| | | | Computation |

Module 30 Compass Compensation

| Syllabus Subject | Level | | Details |
|----------------------|-------|----|-----------------------------------|
| | WTR | TR | |
| Compass Compensation | 2 | - | Base survey techniques |
| | | | Compass swinging areas |
| | | | Aircraft magnetism |
| | | | Terrestrial magnetism – variation |

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| | | | Methods and procedures for swinging compasses |
| | 1 | - | Flux valve operation |
| | 3 | - | Deviation: calculations and effects on a compass |
| | | | Compensation and adjustment procedures |
| | 1 | - | Various compass types |

Module 31 Radio Communication and Navigation – Category ‘R’

| Syllabus Subject | Level | | Details |
|------------------|-------|----|--|
| | WTR | TR | |
| Radio Theory | 1 | - | Propagation of radio waves |
| | | | Polarisation |
| | | | Radiation patterns |
| | | | Transmitters and receivers |
| | | | RF Amps, IF Amps |
| | | | Oscillators, frequency synthesisers |
| | | | Frequency multipliers |
| | | | Mixers, detectors, BFO, AGC |
| | | | Noise limiters, muting circuits, audio amplifiers |
| | | | Modulators, RF power amplifiers matching units |
| | | | Filters and tuned circuits |
| Interference | 2 | - | Principles and methods used to minimise the effects of conducted and radiated interference |

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| | | | Methods used to minimise the effects of lightning strikes and static on aerials |
| Aerials and Feeders | 2 | - | Diplexers, baluns and matching stubs |
| | | | Fixed and variable matching arrangements |
| | | | Locations and types of aerials – communication and navigation |
| | | | Bandwidth and effective height of an aerial |
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| | | | |
|-----------------------------|---|---|---------------------------------------|
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| | | | |
|--|---|---|-------------------------------|
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| | | | |
|---------------|---|---|--|
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| | | | |
|-----------------|---|---|---------------------------------------|
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Civil Aviation (Operation of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022 S.I. No. 84 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 S.I. No. 85 of 2022

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 S.I. No. 86 of 2022

Civil Aviation (Approved Training Organisations) Regulations, 2022 S.I. No. 79 of 2022

Civil Aviation (Approved Maintenance Organisations) Regulations, 2022 S.I. No. 78 of 2022

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GEN. EDWARD KATUMBA WAMALA (MP)
Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

to The Uganda Gazette No. 50, Volume CXV, dated 12th August, 2022

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 68

**THE CIVIL AVIATION (AERONAUTICAL CHARTS)
REGULATIONS, 2022**

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STATUTORY INSTRUMENTS

2022 No. 68

The Civil Aviation (Aeronautical Charts) Regulations, 2022
*(Under sections 35(1) (p) and 61 of the Civil Aviation Authority Act,
Cap. 354)*

IN EXERCISE of the powers conferred on the Minister by section 61 of the Civil Aviation Authority Act, Cap. 354, and on the recommendation of the Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aeronautical Charts) Regulations, 2022.

2. Application

These Regulations apply to a person responsible for the design and production of aeronautical charts for civil aviation purposes.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“aerodrome” means a defined area on land or water including any buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;

“aerodrome elevation” means the elevation of the highest point of the landing area;

“aerodrome operating minima” means the limits of usability of an aerodrome for—

- (a) take-off, expressed in terms of runway visual range or visibility and, if necessary, cloud conditions;
- (b) landing in precision approach and landing operations, expressed in terms of visibility or runway visual range and decision altitude or height (DA/H) as appropriate to the category of the operation;
- (c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility or runway visual range and decision altitude or height (DA/H); and
- (d) landing in non-precision approach and landing operations,, expressed in terms of visibility or runway visual range, minimum descent altitude or height (MDA/H) and, if necessary, cloud conditions;

“aerodrome reference point” means the designated geographical location of an aerodrome;

“aeronautical cartographic service provider” means the entity responsible for the production and publication of aeronautical charts; for the time being the Civil Aviation Authority, Directorate of Air Navigation Services;

“aeronautical chart” means a representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation;

“aircraft stand” means a designated area on an apron intended to be used for parking an aircraft;

“air defence identification zone” means special designated airspace of defined dimensions within which aircraft are required to comply with special identification and reporting procedures additional to those related to the provision of air traffic services (ATS);

“air traffic service” includes flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service);

“air transit route” means a defined route for the air transiting of helicopters;

“airway” means a control area or portion thereof established in the form of a corridor;

“altitude” means the vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL);

“application” means manipulation and processing of data in support of user requirements;

“apron” means a defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fueling, parking or maintenance;

“area minimum altitude (AMA)” means the minimum altitude to be used under instrument meteorological conditions (IMC), which provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians;

“area navigation (RNAV)” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground or space-based navigation aids or within the limits of the capability of self-contained aids or a combination of these;

“arrival routes” means routes identified in an instrument approach procedure by which aircraft may proceed from the en-route phase of flight to an initial approach fix;

“ATS route” means a specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services;

“ATS surveillance system” includes ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft;

“authority” means the Uganda Civil Aviation Authority established under the Act;

“bare earth” means surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects;

“calendar” means discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day;

“canopy” means bare earth supplemented by vegetation height;
“change-over point” means the point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft;

“clearway” means a defined rectangular area on the ground or water under the control of the appropriate authority selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height;

“contour line” means a line on a map or chart connecting points of equal elevation;

“culture” means all man-made features constructed on the surface of the earth, such as cities, railways and canals;

- “cyclic redundancy check” means a mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data;
- “danger area” means an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times;
- “data product specification” means detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party;
- “data quality” means a degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution, integrity or equivalent assurance level, traceability, timeliness, completeness and format;
- “data resolution” means a number of units or digits to which a measured or calculated value is expressed and used;
- “data set” means identifiable collection of data;
- “data set series” means collection of data sets sharing the same product specification;
- “datum” means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities;
- “digital elevation model” means the representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum;
- “displaced threshold” means a threshold not located at the extremity of a runway;
- “distance measuring equipment” is a radio navigation system that measures the slant distance between the system and aircraft equipped with a receiver on board;

“electronic aeronautical chart display” means an electronic device by which flight crews are enabled to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information;

“elevation” means the vertical distance of a point or a level on or affixed to the surface of the earth, measured from mean sea level;

“ellipsoid height or geodetic height” means the height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question;

“feature” means abstraction of real world phenomena;

“feature attribute” means characteristic of a feature;

“final approach” means that part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified—

- (a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- (b) at the point of interception of the last track specified in the approach procedure and ends at a point in the vicinity of an aerodrome from which—
 - (i) a landing can be made; or
 - (ii) a missed approach procedure is initiated;

“final approach and take-off area (FATO)” means a defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced; where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected take-off area available;

- “final approach fix or point” means that fix or point of an instrument approach procedure where the final approach segment commences;
- “final approach segment” means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished;
- “flight information region” means an airspace of defined dimensions within which flight information service and alerting service are provided;
- “flight level” means a surface of constant atmospheric pressure which is related to a specific pressure datum, 1,013.2 hectopascals (hPa), and is separated from other surfaces by specific pressure intervals;
- “geodesic distance” means the shortest distance between any two points on a mathematically defined ellipsoidal surface;
- “geodetic datum” means a minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system or frame;
- “geoid” means the equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level extended continuously through the continents;
- “geoid undulation” means the distance of the geoid above positive or below negative the mathematical reference ellipsoid;
- “glide path” means a descent profile determined for vertical guidance during a final approach;
- “Gregorian calendar” means calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar;

- “height” means the vertical distance of a level, point or an object considered as a point, measured from a specific datum;
- “helicopter stand” means an aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations;
- “heliport” means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters;
- “heliport reference point” means the designated location of a heliport or a landing location;
- “holding procedure” means a predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance;
- “hot spot” means a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots or drivers is necessary;
- “human factors principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;
- “hypsochromic tints” means a succession of shades or colour gradations used to depict ranges of elevation;
- “ICAO” means International Civil Aviation Organisation;
- “initial approach segment” means that segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point;

“instrument approach procedure” means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply;

“instrument landing system” means a precision runway approach aid employing two radio beams to provide pilots with vertical and horizontal guidance during an approach to land;

“integrity classification of aeronautical data” means classification based upon the potential risk resulting from the use of corrupted data and aeronautical data is classified as—

- (a) routine data: where there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- (b) essential data: where there is a very low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- (c) critical data: where there is a very low probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

“intermediate approach segment” means that segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, racetrack or dead reckoning track procedure and the final approach fix or point, as appropriate;

“intermediate holding position” means a designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower;

“isogonal” means a line on a map or chart on which all points have the same magnetic variation for a specified epoch;

“isogriv” means a line on a map or chart which joins points of equal angular difference between the North of the navigation grid and Magnetic North;

“landing area” means that part of a movement area intended for the landing or take-off of aircraft;

“landing direction indicator” means a device to indicate visually the direction currently designated for landing and for take-off;

“level” means the vertical position of an aircraft in flight and includes height, altitude or flight level;

“logon address” means a specified code used for data link logon to an ATS unit;

“magnetic variation” means the angular difference between True North and Magnetic North;

“maneuvering area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons;

“marking” means a symbol or group of symbols displayed on the surface of the movement area to convey aeronautical information;

“metadata” means data about data;

- “microwave landing system” means a precision radio landing system installed at airports which utilizes microwave signals to provide aircraft with the information necessary for a safe approach and landing;
- “minimum en-route altitude (MEA)” means the altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance;
- “minimum obstacle clearance altitude (MOCA)” means the minimum altitude for a defined segment of flight that provides the required obstacle clearance;
- “minimum sector altitude (MSA)” means the lowest altitude which may be used to provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on significant point, the aerodrome reference point or the heliport reference point;
- “missed approach point (MAPT)” means that point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated to ensure that the minimum obstacle clearance is not infringed;
- “missed approach procedure” means the procedure to be followed if the approach cannot be continued;
- “movement area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron;
- “navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace including—

- (a) required navigation performance specification: a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, such as RNP 4, RNP APCH;
- (b) area navigation (RNAV) specification: a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, such as RNAV 5, RNAV1;

“obstacle” means all fixed whether temporary or permanent and mobile objects or parts of objects that—

- (a) are located on an area intended for the surface movement of aircraft;
- (b) extend above a defined surface intended to protect aircraft in flight; or
- (c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation;

“obstacle clearance altitude (OCA) or obstacle clearance height (OCH)” means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria;

“obstacle free zone (OFZ)” means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes;

“orthometric height” means height of a point related to the geoid, generally presented as an MSL elevation;

“performance-based navigation (PBN)” means area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace;

“point light” means a luminous signal appearing without perceptible length;

“portrayal” means presentation of information to humans;
“position

(geographical)” means set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth;

“precision approach” means an instrument approach and landing using precision lateral and vertical guidance with minima as determined by the category of operation—

(a) Category I operation: a precision instrument approach and landing with a decision height not lower than 60m (200ft) and with either a visibility not less than 800m or a runway visual range not less than 550m;

(b) Category II operation: a precision instrument approach and landing with a decision height lower than 60m (200ft) but not lower than 30m (100ft), and a runway visual range not less than 300m;

(c) Category IIIA operation: a precision instrument approach and landing with—

(i) a decision height lower than 30m (100ft), or no decision height; and

(ii) a runway visual range not less than 175m;

(d) Category IIIB operation: a precision instrument approach and landing with—

- (i) a decision height lower than 15m (50ft), or no decision height; and
 - (ii) a runway visual range less than 175m but not less than 50m;
- (e) Category IIIC operation: a precision instrument approach and landing with no decision height and no runway visual range limitations;

“precision approach procedure” means an instrument approach procedure utilising azimuth and glide path information provided by ILS or PAR;

“procedure altitude or height” means a published altitude or height used in defining the vertical profile of a flight procedure, at or above the minimum obstacle clearance altitude or height where established;

“procedure turn” means manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track;

“prohibited area” means an airspace of defined dimensions above the land areas or territorial waters of Uganda, within which the flight of aircraft is prohibited;

“relief” means the inequalities in elevation of the surface of the Earth represented on aeronautical charts by contours, hypsometric tints, shading or spot elevations;

“reporting point” means a specified geographical location in relation to which the position of an aircraft can be reported;

“restricted area” means an airspace of defined dimensions, above the land areas or territorial waters of Uganda, within which the flight of aircraft is restricted in accordance with specified conditions;

“reversal procedure” means a procedure designed to enable aircraft to reverse direction during the initial approach segment of an instrument approach procedure and the sequence may include procedure turns or base turns;

“runway” means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft;

“runway-holding position” means a designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical or sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorised by the aerodrome control tower;

“runway strip” means a defined area including the runway and stopway, if provided, intended—

(a) to reduce the risk of damage to aircraft running off a runway; and

(b) to protect aircraft flying over it during take-off or landing operations;

“runway visual range (RVR)” means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line;

“shoulder” means an area adjacent to the edge of a pavement prepared to provide a transition between the pavement and the adjacent surface;

“significant point” means a specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes;

“stopway” means a defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off;

“taxiing” means movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing;

“taxi-route” means a defined path established for the movement of helicopters from one part of a heliport to another and includes a helicopter air or ground taxiway which is centred on the taxi- route;

“taxiway” means a defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including—

- (a) aircraft stand taxi lane: a portion of an apron designated as a taxiway and intended to provide access to aircraft stands only;
- (b) apron taxiway: a portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron;
- (c) rapid exit taxiway: a taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimising runway occupancy times;

“terminal arrival altitude (TAA)” means the lowest altitude that will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an arc of a circle defined by

a 46 km (25 NM) radius centred on the initial approach fix (IAF), or where there is no IAF on the intermediate approach fix (IF), delimited by straight lines joining the extremity of the arc to the IF: the combined TAAs associated with an approach procedure shall account for an area of 360 degrees around the IF;

“terrain” means the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles;

“threshold” means the beginning of that portion of the runway usable for landing;

“touchdown and lift-off area (TLOF)” means a load bearing area on which a helicopter may touch down or lift off;

“touchdown zone” means the portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway;

“track” means the projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid);

“transition altitude” means the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes;

“vectoring” means provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system;

“very high frequency omnidirectional range (VOR)” means a radio navigation system that determines the position and course of aircraft equipped with a receiver unit on board;

“visual approach procedure” means a series of predetermined manoeuvres by visual reference, from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, a go-around procedure can be carried out;

“waypoint” means a specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

PART II—GENERAL SPECIFICATIONS

4. Availability of charts

The authority shall—

- (a) on the request of another State provide all information relating to its area of jurisdiction;
- (b) make available aeronautical charts in accordance with section 35(1)(p) of the Act and these Regulations as appropriate for a particular chart or single sheet of a chart series;
- (c) for any chart or single sheet of aeronautical chart series entirely contained within Uganda either—
 - (i) produce the chart or sheet itself; or
 - (ii) arrange for the production of the chart or sheet by another State or by an agency;
- (d) for any chart or single sheet of a chart series which includes the territory of another State, in consultation with the State having jurisdiction over the territory so included, determine the manner in which the chart or sheet shall be made available, taking into consideration the regional air navigation agreements and any plan of allocation established by ICAO;

- (e) take all reasonable measures to ensure that the information provided and the aeronautical charts made available are adequate and accurate and that aeronautical charts are maintained and are up to date.

5. Operational requirements for aeronautical charts

- (1) The aeronautical cartographic service provider shall—
 - (a) ensure that each type of chart provides information relevant to the function of the chart and the design of the chart observes human factors principles to facilitate the optimum use of the chart;
 - (b) ensure that each type of chart provides information appropriate to the phase of flight for the safe and expeditious operation of the aircraft as listed below —
 - (i) phase 1—taxi from aircraft stand to take off;
 - (ii) phase 2—take off and climb to en-route air traffic service route structure;
 - (iii) phase 3—en-route air traffic service route structure;
 - (iv) phase 4—descent to approach;
 - (v) phase 5—approach to land and missed approach; (vi) phase 6—landing and taxi to aircraft stand;
 - (c) present the information that is accurate, free from distortion and clutter, unambiguous and readable under all normal operating conditions;
 - (d) use colours or tints and size that ensure that the chart can be easily read and interpreted by the pilot in varying conditions of natural and artificial light;
 - (e) ensure that the information is in a form which enables the pilot to acquire information in a reasonable time consistent with workload and operating conditions; and

(f) present the information on each type of chart in a way that permits smooth transition from chart to chart as appropriate to the phase of flight.

(2) The charts shall be True North orientated.

(3) The basic sheet size of the charts shall be 210 × 297 mm (8.27 x 11.69 inches) (A4).

6. Titles of charts

The aeronautical cartographic service provider shall ensure that the title of a chart or chart series is prepared in accordance with the specifications in these Regulations and satisfy the functions the chart or chart series are intended to perform.

7. Symbols

The aeronautical cartographic service provider shall—

(a) use the symbols conforming to Schedule 1 to these Regulations, except where it is desired to show on an aeronautical chart special features or items of importance to civil aviation for which no symbol is prescribed in Schedule 1 to these Regulations, any appropriate symbol may be chosen for this purpose, provided that it does not cause confusion with symbols in Schedule 1 to these Regulations or impair the legibility of the chart;

(b) use the same basic symbol on all charts on which the symbol appears, regardless of chart purpose to represent ground-based navigation aids, intersections and waypoints;

(c) use the symbol for significant points based on a hierarchy of symbols and selected in the following order —

(i) ground-based navigation aid;

(ii) intersection; and

(iii) waypoint symbol;

- (d) use a waypoint symbol only when a significant point does not exist as either a ground-based navigation aid or intersection; and
- (e) show symbols in the manner specified in subparagraph (b), (c) and (d) and Schedule 1 to these Regulations, symbol number 121.

8. Units of measurement.

The aeronautical cartographic service provider shall—

- (a) derive the distances as geodesic distances;
- (b) express the distances in either kilometres or nautical miles or both, provided the units are clearly differentiated;
- (c) express the altitudes, elevations and heights in feet;
- (d) express the linear dimensions on aerodromes and short distances in metres;
- (e) specify the order of resolution of distances, dimensions, elevations and heights for a chart;
- (f) conspicuously indicate on the face of each chart the units of measurement used to express distances, altitudes, elevations and heights; and
- (g) provide the conversion scales on the chart on which distances, elevations or altitudes are shown and place the conversion scales on the face of the chart.

9. Scale and projection

The aeronautical cartographic service provider shall—

- (a) indicate the name, basic parameters and scale of the projection on the charts of large areas; and
- (b) in the case of charts of small areas, indicate only a linear scale.

10. Date of validity of aeronautical information

The aeronautical cartographic service provider shall clearly indicate on the face of the chart the date of validity of the aeronautical information.

11. Spelling of geographical names

The aeronautical cartographic service provider shall—

- (a) use the symbols of the roman alphabet for all writing;
- (b) where the abbreviation word of geographical terms such as “cape”, “point”, “gulf”, “river”, is used on a chart, spell out the abbreviated term in full in respect of the most important example of each type; and
- (c) not use punctuation marks in abbreviations within the body of a chart.

12. Abbreviations

The aeronautical cartographic service provider shall use abbreviations on aeronautical charts whenever they are appropriate that are selected from the Procedures for Air Navigation Services -ICAO Abbreviations and Codes (Doc 8400), where applicable.

13. Political boundaries

The aeronautical cartographic service provider shall—

- (a) show the international boundaries which may be interrupted if data more important to the use of the chart is likely to be obscured; and
- (b) indicate the names identifying the countries where the territory of more than one State appears on a chart.

14. Colours

The aeronautical cartographic service provider shall, in designing and producing charts use the colours prescribed in Schedule 2 to these Regulations.

15. Relief

The aeronautical cartographic service provider shall—

- (a) depict the relief, where shown, in a manner that satisfy the needs of the chart users for—

- (i) orientation and identification;
 - (ii) safe terrain clearance;
 - (iii) clarity of aeronautical information when shown; and
 - (iv) planning;
- (b) where relief is shown by hypsometric tints, use the tints that comply with the specifications in Schedule 3 to these Regulations;
 - (c) show the spot elevations for selected critical points where spot elevations are used; and
 - (d) ensure that the value of spot elevations of doubtful accuracy is followed by the sign \pm .

16. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall include the reference or other identification where prohibited, restricted or danger areas are shown, but may omit the nationality letter.

17. Air traffic services airspaces

(1) The aeronautical cartographic service provider shall indicate the class of airspace, type, name or call sign, vertical limits and radio frequency to be used when air traffic service airspace is shown on a chart and shall depict the horizontal limits in accordance with Schedule 1 to these Regulations.

(2) For charts used for visual flight, the parts of air traffic services airspace classes indicated in the Civil Aviation (Air Traffic Services) Regulations, 2022, applicable to airspaces depicted on the chart shall be on the face or reverse of each chart.

18. Magnetic variation

The aeronautical cartographic service provider shall—

- (a) indicate the True North and magnetic variation and the order of resolution of magnetic variation as specified for a particular chart;

- (b) ensure that when magnetic variation is shown on a chart, the values shown are those for the year nearest to the date of publication that is divisible by five; and
- (c) for instrument procedure charts, complete the publication of a magnetic variation change within a maximum of six AIRAC cycles.

19. Aeronautical data

The aeronautical cartographic service provider shall—

- (a) take all necessary measures to introduce a properly organised quality system containing procedures, processes and resources necessary to implement quality management at each function stage as specified in the Civil Aviation (Aeronautical Information Services) Regulations, 2022;
- (b) execute quality management that is demonstrable for each function stage, when required;
- (c) establish procedures to ensure that aeronautical data is traceable to its origin to detect any data anomalies or errors during the production and maintenance phases or in the operational use so as to correct them;
- (d) ensure that the order of chart resolution of aeronautical data is as specified for a particular chart and presented in the Civil Aviation (Aeronautical Information Services) Regulations, 2022;
- (e) maintain the integrity of aeronautical data throughout the data process from origination to distribution to the next intended user; and
- (f) use digital data error detection techniques during the transmission and storage of aeronautical data and digital data sets.

20. Horizontal reference system

The aeronautical cartographic service provider shall—

- (a) use the World Geodetic System-1984 (WGS-84) as the horizontal reference system;
- (b) ensure published aeronautical geographical coordinates indicating latitude and longitude in terms of WGS-84 geodetic reference datum;
- (c) identify by an asterisk the geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in the Civil Aviation (Air Traffic Services) Regulations, 2022 and the Civil Aviation (Aerodrome) Regulations, 2022; and
- (d) ensure that the chart resolution of geographical coordinates is that specified for a particular chart series in the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

21. Vertical reference system

The aeronautical cartographic service provider shall—

- (a) use the mean sea level datum as the vertical reference system;
- (b) publish the elevations referenced to mean sea level, for the specific surveyed ground positions, geoid undulation referenced to the WGS-84 ellipsoid, for the surveyed positions as specified for a particular chart; and
- (c) ensure that the chart resolution of elevation and geoid undulation is as specified for a particular chart series in the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

22. Temporal reference system

The aeronautical cartographic service provider shall—

- (a) use the Gregorian calendar and Coordinated Universal Time as the temporal reference system; and
- (b) indicate in GEN 2.1.2 of the Aeronautical Information Publication a temporal reference system used for charting, if different from the one specified in paragraph (a).

23. Miscellaneous information

The aeronautical cartographic service provider shall—

- (a) use the marginal note layout as prescribed in Schedule 4 to these Regulations, except where otherwise specified for a particular chart;
- (b) show the following information on the face of each chart unless otherwise stated in the specification of the chart concerned —
 - (i) designation or title of the chart series;
 - (ii) name and reference of the sheet;
 - (iii) on each margin an indication of the adjoining sheet, where applicable;
- (c) provide a legend to the symbols and abbreviations used on the face or reverse of each chart except that, where it is impracticable for reasons of space, publish a legend separately; and
- (d) show the name and address of the Authority in the margin of the chart except that, where the chart is published as part of an aeronautical document, this information may be placed in the front of the aeronautical document.

PART III—AERODROME OBSTACLE CHART—TYPE A
(OPERATING LIMITATIONS)

24. Function of Aerodrome Obstacle Chart-Type A

The aeronautical cartographic service provider shall ensure that the Aerodrome Obstacle Chart -Type A, in combination with the relevant information published in the Aeronautical Information Publication, provides the data necessary to enable an operator to comply with the operating limitations of the Civil Aviation (Operations of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022.

25. Availability of Aerodrome Obstacle Chart-Type A

The aeronautical cartographic service provider shall—

- (a) make available the Aerodrome Obstacle Chart —Type A in the manner specified in regulation 4(b) for all aerodromes regularly used by international civil aviation, except for those aerodromes where there are no obstacles in the take-off flight path areas or where the Aerodrome Terrain and Obstacle Chart-(Electronic) is provided in accordance with Part IV of these Regulations; and
- (b) publish a notification in the Aeronautical Information Publication where a chart is not required due to nonexistence of obstacles in the take-off flight path area.

26. Unit of measurement on Aerodrome Obstacle Chart-Type A

The aeronautical cartographic service provider shall indicate on the Aerodrome Obstacle Chart-Type A the elevations to the nearest foot and the linear dimensions to the nearest half-metre.

27. Coverage and scale on an Aerodrome Obstacle Chart-Type A

The aeronautical cartographic service provider shall—

- (a) ensure that the extent or coverage of each Aerodrome Obstacle Chart-Type A is sufficient to cover all obstacles;
- (b) ensure that the horizontal scale is within the range of 1:10000 to 1:15 000;

- (c) ensure that vertical scale is ten times the horizontal scale; and
- (d) include the horizontal and vertical linear scales showing both metres and feet in the charts.

28. Format of Aerodrome Obstacle Chart-Type A

- (1) The aeronautical cartographic service provider shall—
 - (a) depict on the Aerodrome Obstacle Chart-Type A, a plan and profile of each runway, any associated stop way or clearway, the take-off flight path area and obstacles;
 - (b) show the profile for each runway, stop way, clearway and the obstacles in the take-off flight path area above its corresponding plan.
- (2) Subject to subregulation (1)(b), the profile of an alternative take-off flight path area shall comprise a linear projection of the full take-off flight path and shall be disposed above its corresponding plan in the manner most suited to the ready interpretation of the information.
- (3) The aeronautical cartographic service provider shall—
 - (a) rule over the entire profile area exclusive of the runway a profile grid;
 - (b) ensure that zero for vertical coordinates is mean sea level and zero for horizontal coordinates is at the end of the runway furthest from the take-off flight path area concerned;
 - (c) show graduation marks indicating the sub-divisions of intervals along the base of the grid and along the vertical margins;
 - (d) ensure that vertical grid has intervals of 30m (100ft) and the horizontal grid has intervals of 300m (1 000ft); and

- (e) ensure that the chart includes—
 - (i) a box for recording the operational data specified in regulation 33; and
 - (ii) a box for recording amendments and dates of amendments.

29. Identification

The aeronautical cartographic service provider shall identify the Aerodrome Obstacle Chart-Type A by the name of the country, name of the city, town or area which the aerodrome serves, the name of the aerodrome and the designator of the runway.

30. Magnetic variation

The aeronautical cartographic service provider shall indicate the magnetic variation to the nearest degree and date of information.

Aeronautical Data

31. Obstacles

The aeronautical cartographic service provider shall—

- (a) consider the objects in the take-off flight path area which project above a plane surface having a 1.2 percent slope and having a common origin with the take-off flight path area as obstacles, except that obstacles lying wholly below the shadow of other obstacles as defined in paragraph (b) and (d) need not be shown;
- (b) consider the mobile objects such as boats, trains and trucks, which may project above the 1.2 percent plane, as obstacles but shall not consider the mobile objects as being capable of creating a shadow;
- (c) consider the shadow of an obstacle to be a plane surface originating at a horizontal line passing through the top of the obstacle at right angles to the centre line of the take-off flight path area;

- (d) indicate that the plane covers the complete width of the take-off path area and extend to the plane defined in paragraphs (a) and (b) or to the next higher obstacle if it occurs first; for the first 300m of the take-off flight path area, the shadow planes are horizontal and beyond this point such planes have an upward slope of 1.2 percent; and
- (e) where the obstacle creating a shadow is likely to be removed, show the objects that would become obstacles by removal of obstacle.

32. Take-off flight path area

The aeronautical cartographic service provider shall—

- (a) provide the take-off flight path area consisting of a quadrilateral area on the surface of the earth lying directly below and symmetrically disposed about the take-off flight path with the following characteristics—
 - (i) commences at the end of the area declared suitable for take-off;
 - (ii) the width at the point of origin is 180m and this width increases at the rate of $0.25D$ to a maximum of 1800m, where D is the distance from the point of origin;
 - (iii) extends to the point beyond which no obstacles exist or to a distance of 10.0 km, whichever is the lesser; and
- (b) for runways serving aircraft having operating limitations which do not preclude the use of a take-off flight path gradient of less than 1.2 per cent, increase the extent of the take-off flight path area specified in paragraph (a)(iii) to not less than 12km; in addition, reduce the slope of the plane surface specified in regulation 31 (a), (b) and (c) to 1.0 percent or less.

33. Declared distances

The aeronautical cartographic service provider shall—

- (a) enter the following information in the space provided for each direction of each runway—
 - (i) take-off run available;
 - (ii) accelerate-stop distance available;
 - (iii) take-off distance available;
 - (iv) landing distance available; and
- (b) identify a runway as “not usable for take-off, landing or both” where a declared distance is not provided due to a runway being usable in only one direction.

34. Plan and profile views

(1) The aeronautical cartographic service provider shall ensure that the plan view shows—

- (a) the outline of the runways by a solid line, including the length and width, the magnetic bearing to the nearest degree, and the runway number;
- (b) the outline of the clearways by a broken line, including the length and identification of the clearways;
- (c) the take-off flight path areas by a dashed line and the centre line by a fine line consisting of short and long dashes;
- (d) the alternative take-off flight path areas and where alternative take-off flight path areas not centered on the extension of the runway centre line are shown, provide notes explaining the significance of the areas;
- (e) obstacles, including—
 - (i) the exact location of each obstacle together with a symbol indicative of its type;

- (ii) the elevation and identification of each obstacle; and
 - (iii) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.
- (2) The aeronautical cartographic service provider shall—
 - (a) indicate the nature of the runway and stopway surfaces;
 - (b) identify the stopways as such and depict them by a broken line; and
 - (c) indicate the length of each stopway, when stopways are shown.
- (3) The aeronautical cartographic service provider shall ensure that the profile view shows—
 - (a) the profile of the centre line of the runway by a solid line and the profile of the centre of any associated stopways and clearways by a broken line;
 - (b) the elevation of the runway center line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway;
 - (c) obstacles including—
 - (i) each obstacle by a solid vertical line extending from a convenient grid line over at least one other grid line to the elevation of the top of the obstacle;
 - (ii) identification of each obstacle;
 - (iii) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.

35. Accuracy

The aeronautical cartographic service provider shall—

- (a) show the order of accuracy attained on the chart;
- (b) determine the horizontal dimensions and the elevations of the runway, stop way and clearway to be printed on the chart are determined to the nearest 0.5 m;
- (c) ensure that the order of accuracy of the field work and the precision of chart production are such that measurements in the take-off flight path areas can be taken from the chart within the following maximum deviations—
 - (i) horizontal distances: 5 m at a point of origin increasing at a rate of 1 per 500;
 - (ii) vertical distances: 1.5ft in the first 1 000ft and increasing at a rate of 1 per 1 000; and
- (d) state the elevation of the datum used and identify the datum as assumed, where no accurate datum for vertical reference is available.

PART IV—AERODROME OBSTACLE CHART—TYPE B

36. Function of Aerodrome Obstacle Chart-Type B

The aeronautical cartographic service provider shall ensure that the Aerodrome Obstacle Chart – Type B provides information to satisfy the following functions—

- (a) the determination of minimum safe altitudes or heights including those for circling procedures;
- (b) the determination of procedures for use in the event of an emergency during take-off or landing;
- (c) the application of obstacle clearing and marking criteria; and
- (d) the provision of source material for aeronautical charts.

37. Availability of Aerodrome Obstacle Chart-Type B

The aeronautical cartographic service provider shall—

- (a) make available the Aerodrome Obstacle Chart-Type B in the manner prescribed in regulation 4(b) for all aerodromes regularly used by international civil aviation, except for those aerodromes where the Aerodrome Terrain and Obstacle Chart- Electronic is provided in accordance with Part V of these Regulations; and
- (b) where the chart combines the specifications of Part III and Part IV of these Regulations, name the Aerodrome Obstacle Chart-Type B as the Aerodrome Obstacle Chart - Comprehensive.

38. Units of measurement on Aerodrome Obstacle Chart-Type B

The aeronautical cartographic service provider shall show the elevations on the Aerodrome Obstacle Chart- Type B to the nearest foot and the linear dimensions to the nearest half-metre.

39. Coverage and scale of Aerodrome Obstacle Chart-Type B

The aeronautical cartographic service provider shall—

- (a) ensure that the extent or coverage of each Aerodrome Obstacle Chart-Type B is sufficient to cover all obstacles;
- (b) use the horizontal scale within the range of 1:10 000 to 1:20 000; and
- (c) include in the chart a horizontal linear scale showing both metres and feet and when necessary, a linear scale for kilometres and a linear scale for nautical miles.

40. Format of Aerodrome Obstacle Chart- Type B

The aeronautical cartographic service provider shall include on the Aerodrome Obstacle Chart-Type B—

- (a) any necessary explanation of the projection used;
- (b) any necessary identification of the grid used;

- (c) a notation indicating that obstacles are those which penetrate the surfaces specified in the Civil Aviation (Aerodromes) Regulations, 2022;
- (d) a box for recording amendments and dates of amendments; and
- (e) outside the neat line, every minute of latitude and longitude marked in degrees and minutes.

41. Identification

The aeronautical cartographic service provider shall identify the Aerodrome Obstacle Chart-Type B by the name of the country, name of the city, town or area which the aerodrome serves, and the name of the aerodrome.

42. Culture and topography

The aeronautical cartographic service provider shall—

- (a) keep the drainage and hydrographic details to a minimum;
- (b) show the buildings and other salient features associated with the aerodrome and wherever possible, to scale;
- (c) all objects, either cultural or natural, that project above the take-off and approach surfaces specified in regulation 44 or the clearing and marking surfaces specified in the Civil Aviation (Aerodrome) Regulations, 2022; and
- (d) show roads and railroads within the take-off and approach area, and less than 600m from the end of the runway or runway extensions.

43. Magnetic variation

The aeronautical cartographic service provider shall show a compass rose on the chart, orientated to the True North or a North point, showing the magnetic variation to the nearest degree with the date of magnetic information and annual change.

44. Aeronautical data

(1) The aeronautical cartographic service provider shall show on the Aerodrome Obstacle Chart-Type B—

- (a) the aerodrome reference point and its geographical coordinates in degrees, minutes and seconds;
- (b) the outline of the runways by a solid line;
- (c) the length and width of the runway;
- (d) the magnetic bearing to the nearest degree of the runway and the runway number;
- (e) the elevation of the runway centre line at each end of the runway, stopway, origin of each take-off and approach area, and at each significant change of slope of runway and stopway;
- (f) taxiways, aprons and parking areas identified as such and the outlines by a solid line;
- (g) stop ways identified and depicted by a broken line;
- (h) the length of each stopway;
- (i) clearways identified and depicted by a broken line;
- (j) the length of each clear way;
- (k) take-off and approach surfaces identified as such and depicted by a broken line;
- (l) take-off and approach areas;
- (m) obstacles at their exact location, including—
 - (i) a symbol indicative of their type;
 - (ii) elevation;

- (iii) identification; and
 - (iv) limits of penetration of large extent in a distinctive manner identified in the legend; and
 - (n) any additional obstacles, as determined by regulation 31(a) and (b) including obstacles in the shadow of an obstacle, which would otherwise be exempted.
- (2) The aeronautical cartographic service provider shall—
- (a) provide the nature of the runway and stopway surfaces;
 - (b) where practicable, indicate the highest object or obstacle between adjacent approach areas within a radius of 5000m from aerodrome reference point in a prominent manner; and
 - (c) show the extent of tree areas and relief features, part of which constitute obstacles.

45. Accuracy on Aerodrome Obstacle Chart-Type B

The aeronautical cartographic service provider shall—

- (a) show the order of accuracy attained on the chart;
- (b) ensure that the horizontal dimensions and the elevations of the movement area, stopways and clearways to be printed on the chart are determined to the nearest 0.5 m;
- (c) ensure that the order of accuracy of the field work and the precision of chart production is such that the resulting data is within the maximum deviations as follows—
 - (i) for the take-off and approach areas, indicate the horizontal distances of 5 m at point of origin increasing at a rate of 1 per 500 and vertical distances of 1.5ft in the first 1,000ft and increasing at a rate of 1 per 1,000; and

- (ii) for other areas, indicate the horizontal distances of 5m within 5,000m of the aerodrome reference point and 12m beyond that area and vertical distances of 3ft within 5,000ft of the aerodrome reference point increasing at a rate of 1 per 1 000; and
- (d) state the elevation of the datum used and identify the datum as assumed, where no accurate datum for vertical reference is available.

PART V—AERODROME TERRAIN AND OBSTACLE
CHART – ELECTRONIC

46. Function of Aerodrome Terrain and Obstacle Chart-Electronic

The aeronautical cartographic service provider shall ensure that the Aerodrome Terrain and Obstacle Chart- Electronic portrays the terrain and obstacle data in combination with aeronautical data, as appropriate, necessary to—

- (a) enable an operator to comply with the operating limitations of the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (Aeroplanes) Regulations, 2022, by developing contingency procedures for use in the event of an emergency during a missed approach or take-off, and by performing aircraft operating limitations analysis; and
- (b) support the following air navigation applications—
 - (i) instrument procedure design including circling procedure;
 - (ii) aerodrome obstacle restriction and removal; and
 - (iii) provision of source data for the production of other aeronautical charts.

47. Availability of Aerodrome Terrain and Obstacle Chart-Electronic

The aeronautical cartographic service provider shall—

- (a) make available the Aerodrome Terrain and Obstacle Charts-Electronic in the manner specified in regulation 4(b) for aerodromes regularly used by international civil aviation;
- (b) make available the Aerodrome Terrain and Obstacle Chart-Electronic in hard copy format upon request; and
- (c) use ISO 19100 series of standards for geographic information as a general data modelling framework.

48. Identification

The aeronautical cartographic service provider shall identify the Aerodrome Terrain and Obstacle Chart-Electronic by the name of the country, name of the city or town which the aerodrome serves and the name of the aerodrome.

49. Chart coverage of Aerodrome Terrain and Obstacle Chart-Electronic

The aeronautical cartographic service provider shall ensure that the extent of each Aerodrome Terrain and Obstacle Chart- Electronic chart is sufficient to cover Area 2 as specified in the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

50. General specifications for Aerodrome Terrain and Obstacle Chart-Electronic

The aeronautical cartographic service provider shall—

- (a) specify the relationships between features, feature attributes, the underlying spatial geometry and associated topological relationships by an application schema when developing computer graphic applications that are used to portray features on the chart;

- (b) provide the portrayed information based on portrayal specifications applied according to defined portrayal rules where portrayal specifications and portrayal rules are not part of the data set;
- (c) store the portrayal rules in a portrayal catalogue referring to separately stored portrayal specifications; and
- (d) portray features using the symbols specified in regulation 7 and Schedule 1 to these Regulations.

51. Terrain feature

The aeronautical cartographic service provider shall—

- (a) ensure that the terrain feature and associated attributes to be portrayed and database-linked to the Aerodrome Terrain and Obstacle Chart-Electronic are based on the terrain data sets which satisfy the requirements of the Civil Aviation (Aeronautical Information Services) Regulations, 2022;
- (b) portray the terrain feature in a manner that provides an effective general impression of a terrain and a representation of terrain surface by continuous elevation values at all intersections of the defined grid, also known as the digital elevation model;
- (c) provide the representation of terrain surface as a selectable layer of contour lines in addition to the digital elevation model;
- (d) use an ortho-rectified image which matches the features on the digital elevation model with features on the overlying image to enhance the digital elevation model and provide the image as a separate selectable layer;
- (e) link the portrayed terrain feature to the following associated attributes in the database—
 - (i) horizontal positions of grid points in geographic coordinates and elevations of the points;

- (ii) surface type;
 - (iii) contour line values, if provided; and
 - (iv) names of cities, towns and other prominent topographic features;
- (f) link additional terrain attributes provided in the database to the portrayed terrain feature.

52. Obstacle features

The aeronautical cartographic service provider shall—

- (a) ensure that the obstacle features and associated attributes, portrayed or database linked to the Aerodrome Terrain and Obstacle Chart-Electronic on obstacle data sets satisfy the requirements of the Civil Aviation (Aeronautical Information Services) Regulations, 2022;
- (b) portray each obstacle by an appropriate symbol and obstacle identifier;
- (c) link the portrayed obstacle feature to the following associated attributes in the database—
 - (i) horizontal position in geographic coordinates and associated elevation;
 - (ii) obstacle type; and
 - (iii) obstacle extent, if appropriate; and
- (d) link the additional obstacle attributes provided in the database to the portrayed obstacle feature.

53. Aerodrome features

The aeronautical cartographic service provider shall—

- (a) portray the aerodrome features and associated attributes and link the database to the chart based on the aerodrome

data which satisfy the requirements of the Civil Aviation (Aeronautical Information Services) Regulations, 2022;

- (b) portray the following aerodrome features by an appropriate symbol—
 - (i) aerodrome reference point;
 - (ii) runways, with designation numbers, and if available, stopways and clearways; and
 - (iii) taxiways, aprons, large buildings and other prominent aerodrome features;
- (c) link the portrayed aerodrome feature to the following associated attributes in the database –
 - (i) geographical coordinates of the aerodrome reference point;
 - (ii) aerodrome magnetic variation, year of information and annual change;
 - (iii) length and width of runways, stop ways and clearways;
 - (iv) type of surface of runways and stopways;
 - (v) magnetic bearings of the runways to the nearest degree;
 - (vi) elevations at each end of runways, stopways and clearways, and at each significant change in slope of runways and stopways;
 - (vii) declared distances for each runway direction, or the abbreviation “NU” where a runway direction cannot be used for take-off or landing or both.

54. Radio navigation aid features

The aeronautical cartographic service provider shall portray each radio navigation aid feature located within the chart coverage by an appropriate symbol.

55. Accuracy and resolution of Aerodrome Terrain and Obstacle Chart-Electronic

The aeronautical cartographic service provider shall—

- (a) ensure that the order of accuracy of aeronautical, terrain and obstacle data is in accordance with its intended use; and
- (b) ensure that the aeronautical, terrain and obstacle data resolution is commensurate with the actual data accuracy.

56. Electronic functionality

The aeronautical cartographic service provider shall—

- (a) ensure that it is possible to vary the scale at which the chart is viewed;
- (b) ensure that the symbols and text size vary with chart scale to enhance readability;
- (c) geo-reference the information on the chart and make it possible to determine cursor position to at least the nearest second;
- (d) ensure that the chart is compatible with widely available desktop computer hardware, software and media;
- (e) include a reader software on the chart;
- (f) put in place measures to guard against removal of information from the chart without an authorised update;
- (g) provide the selectable information layers to allow for the customised combination of information when due to congestion of information, the details necessary to support

the function of the chart cannot be shown with sufficient clarity on a single comprehensive chart view; and

- (h) ensure that the chart can be printed in hard copy format according to the content specifications and scale determined by the user.

57. Aerodrome Terrain and Obstacle Chart-Electronic data product specifications

(1) The aeronautical cartographic service provider shall provide a comprehensive statement of the data sets comprising the Aerodrome Terrain and Obstacle Chart-Electronic chart in the form of data product specifications on which basis air navigation users will be able to evaluate the chart data product and determine whether it fulfils the requirements for its intended use.

(2) The chart data product specifications in subregulation (1) shall include—

- (a) an overview;
- (b) a specification scope;
- (c) a data product identification;
- (d) data content information;
- (e) the reference systems used;
- (f) the data quality requirements and information on data or data capture;
- (g) data maintenance;
- (h) data portrayal;
- (i) data product delivery;
- (j) metadata; and
- (k) any additional information available.

(3) The overview of the chart data product specifications referred to in subregulation (2)(a) shall provide an informal description

of the product and shall contain the general information about the data product.

(4) The specification scope of the chart data product specifications referred to in subregulation (2) (b) shall contain the spatial extent of the chart coverage.

(5) The chart data product identification referred to in subregulation (2) (c) shall include the title of the product, a brief narrative summary of the content and purpose and a description of the geographic area covered by the chart.

(6) The data content of the chart data product specifications shall clearly identify the type of coverage and imagery and provide a narrative description of each.

(7) The aeronautical cartographic service provider shall include on the Aerodrome Obstacle Chart-Type B data product specifications, information that defines the reference systems used including the spatial reference system, horizontal and vertical, and if appropriate, temporal reference system.

(8) The chart data product specifications shall identify the data quality requirements including a statement on—

- (a) acceptable conformance quality levels; and
- (b) corresponding data quality measures covering all the data quality elements and data quality sub-elements or where appropriate, a statement to the effect that specific data quality element or sub-element is not applicable.

(9) The chart data product specifications shall—

- (a) include a data capture statement describing the sources and processes applied for the capture of chart data;

- (b) provide the principles and criteria applied in the maintenance of the chart, including the frequency with which the chart product is updated and shall—
 - (i) state the maintenance information of obstacle data sets included on the chart; and
 - (ii) indicate the principles, methods and criteria applied for obstacle data maintenance;
- (c) contain information on how data are portrayed on the chart, as prescribed in regulation 51;
- (d) contain the data product delivery information which include delivery formats and delivery medium information;
- (e) include core chart metadata elements and any additional metadata items required to be supplied in the product specifications together with the format and encoding of the metadata.

PART VI—PRECISION APPROACH TERRAIN CHART

58. Function of Precision Approach Terrain Chart

The aeronautical cartographic service provider shall ensure that the precision approach terrain chart provides detailed terrain profile information within a defined portion of the final approach to enable aircraft operating agencies to assess the effect of the terrain on decision height determination using radio altimeters.

59. Availability of Precision Approach Terrain Chart

The aeronautical cartographic service provider shall—

- (a) make available the Precision Approach Terrain Chart for all precision approach runways Categories II and III at aerodromes used by international civil aviation, except where the requisite information is provided in the Aerodrome Terrain and Obstacle Chart-Electronic in accordance with Part V of these Regulations; and

- (b) revise the Precision Approach Terrain Chart whenever any significant change occurs.

60. Scale of Precision Approach Terrain Chart

The aeronautical cartographic service provider shall—

- (a) ensure that the scale of the Precision Approach Terrain Chart is horizontal 1:2500 and vertical 1:500; and
- (b) ensure that when the Precision Approach Terrain Chart includes a profile of the terrain to a distance greater than 900m from the runway threshold, the horizontal scale is 1:5000.

61. Identification

The aeronautical cartographic service provider shall identify the Precision Approach Terrain Chart by the name of the country, name of the city, town or area which the aerodrome serves, the name of the aerodrome and the designator of the runway.

62. Plan and profile information

(1) The aeronautical cartographic service provider shall include on the precision approach terrain chart the following—

- (a) a plan showing contours at 1m (3ft) intervals in the area 60m (200 ft) on either side of the extended centre line of the runway, to the same distance as the profile, the contours to be related to the runway threshold;
- (b) an indication where the terrain or any object, within the plan defined in paragraph (a), differs by ± 3 m (10 ft) in height from the centre line profile and is likely to affect a radio altimeter; and
- (c) a profile of the terrain to a distance of 900m from the threshold along the extended centre line of the runway.

(2) The aeronautical cartographic service provider shall—

- (a) where the terrain at a distance greater than 900m from the runway threshold is mountainous or otherwise significant

to users of the chart, show the profile of the terrain to a distance not exceeding 2000m from the runway threshold;

- (b) show the instrument landing system (ILS) reference datum height to the nearest foot.

PART VII—ENROUTE CHART

63. Function of Enroute Chart

The aeronautical cartographic service provider shall ensure that the En-route chart provides flight crews with information to facilitate navigation along Air Traffic Service routes in compliance with air traffic services procedures.

64. Availability of Enroute Chart

The aeronautical cartographic service provider shall—

- (a) make available the Enroute chart in the manner prescribed in regulation 4(b) for all areas where flight information regions have been established;
- (b) provide separate Enroute charts where different air traffic services routes, position reporting requirements or lateral limits of flight information regions or control areas exist in different layers of airspace and cannot be shown with sufficient clarity on one chart.

65. Coverage and scale of Enroute Chart

The aeronautical cartographic service provider shall—

- (a) determine the layout of sheet lines by the density and pattern of the air traffic service route structure;
- (b) avoid large variations of scale between adjacent charts showing a continuous route structure; and
- (c) provide an adequate overlap of charts to ensure continuity of navigation.

66. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle;
- (b) show the parallels and meridians at suitable intervals; and
- (c) place the graduation marks at consistent intervals along selected parallels and meridians.

67. Identification

The aeronautical cartographic service provider shall identify each sheet of the Enroute Chart by chart series and number.

68. Culture and topography

The aeronautical cartographic service provider shall—

- (a) show the generalised shore lines of all open water areas, large lakes and rivers except where they conflict with data more applicable to the function of the Enroute Chart;
- (b) show the area minimum altitude within each quadrilateral formed by the parallels and meridians; and
- (c) indicate clearly the selected orientation used, where charts are not True North orientated.

69. Magnetic variation

The aeronautical cartographic service provider shall indicate the isogonal and the date of the isogonic information.

70. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that the bearings, tracks and radials are magnetic and show the bearings and tracks in parentheses to the nearest tenth of a degree where bearings and tracks are additionally provided as true values for area navigation segments; and

- (b) clearly indicate, where bearings, tracks or radials are given with reference to True North or Grid North and identify the reference grid meridian when Grid North is used.

Aeronautical Data

71. Aerodromes

The aeronautical cartographic service provider shall show on an Enroute Chart, all aerodromes used by international civil aviation to which an instrument approach can be made.

72. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall depict on an Enroute Chart the prohibited, restricted and danger areas relevant to the layer of airspace with their identification and vertical limits.

73. Air traffic services system

The aeronautical cartographic service provider shall—

- (a) show the components of the established air traffic services system on an Enroute Chart, where appropriate;
- (b) include the following components on the Enroute Chart—
 - (i) the radio navigation aids associated with the air traffic services system together with their names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds;
 - (ii) in respect of distance measuring equipment (DME), additionally the elevation of the transmitting antenna of the DME to the nearest 30m (100ft);
 - (iii) an indication of all designated airspace, including lateral and vertical limits and the appropriate class of airspace;
 - (iv) all air traffic services routes for en-route flight including route designators, the track to the nearest

degree in both directions along each segment of the routes and, where established, the designation of the navigation specifications including any limitations and the direction of traffic flow;

- (v) all significant points which define the air traffic services routes and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;
- (vi) in respect of waypoints defining very high frequency omni directional range (VOR) or DME area navigation routes, additionally—
 - (aa) the station identification and radio frequency of the reference VOR or DME;
 - (bb) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR or DME, if the waypoint is not collocated with it;
- (vii) an indication of all compulsory and “on-request” reporting points and air traffic service (ATS) or meteorological reporting points;
- (viii) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
- (ix) change-over points on route segments defined by reference to very high frequency omnidirectional radio ranges, indicating the distances to the nearest kilometre or nautical mile to the navigation aids;

- (x) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet;
- (xi) communication facilities listed with their channels and, if applicable, logon address and satellite voice communications (SATVOICE) number; and
- (xii) air defence identification zone (ADIZ) properly identified.

74. Supplementary information

The aeronautical cartographic service provider shall—

- (a) indicate the details of departure, arrival routes and associated holding patterns in terminal areas on an Enroute Chart unless they are shown on an Area Chart, a Standard Departure Chart -Instrument (SID) or a Standard Arrival Chart- Instrument (STAR); and
- (b) show and identify the altimeter setting regions where established.

PART VIII—AREA CHART

75. Function of Area Chart

The aeronautical cartographic service provider shall ensure that the Area Chart provides the flight crew with information to facilitate the following phases of instrument flight—

- (a) the transition between the en-route phase and approach to an aerodrome;
- (b) the transition between take-off or missed approach and en-route phase of flight; and
- (c) areas of complex ATS routes or airspace structure.

76. Availability of Area Chart

The aeronautical cartographic service provider shall—

- (a) make available the Area Chart in the manner specified in regulation 4(b) where the air traffic services routes or position reporting requirements are complex and cannot be adequately shown on an Enroute Chart; and
- (b) provide separate Area Charts where air traffic services routes or position reporting requirements are different for arrivals and for departures and cannot be shown with sufficient clarity on one Area Chart.

77. Coverage and scale of Area Chart

The aeronautical cartographic service provider shall—

- (a) ensure that the coverage of each Area Chart extends to points that effectively show departure and arrival routes; and
- (b) draw the Area Chart to scale and show a scale-bar.

78. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle;
- (b) depict the parallels and meridians at suitable intervals; and
- (c) place the graduation marks at consistent intervals along the neat lines, as appropriate.

79. Identification

The aeronautical cartographic service provider shall identify the Area Chart by a name associated with the airspace portrayed.

80. Culture and topography

The aeronautical cartographic service provider shall—

- (a) show the generalised shorelines of all open water areas, large lakes and rivers on the Area Chart except where they conflict with data more applicable to the function of the charts;
- (b) show all relief exceeding 300m (1000ft) above the elevation of the primary aerodrome by smoothed contour lines, contour values and layer tints printed in brown, in areas where significant relief exists; and
- (c) show appropriate spot elevations, including the highest elevation within each top contour line, printed in black and obstacles shown.

81. Magnetic variation

The aeronautical cartographic service provider shall show the average magnetic variation of the area covered by the Area Chart to the nearest degree.

82. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that the bearings, tracks and radials are magnetic and show the bearings and tracks in parentheses to the nearest tenth of a degree where bearings and tracks are additionally provided as true values for RNAV segments; and
- (b) clearly indicate where bearings, tracks or radials are given with reference to True North or Grid North and identify the reference grid meridian, when Grid North is used.

Aeronautical Data

83. Aerodromes

The aeronautical cartographic service provider shall show all aerodromes which affect the terminal routings and where appropriate, use a runway pattern symbol.

84. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall depict the prohibited, restricted and danger areas with their identification and vertical limits on the Area Chart.

85. Area minimum altitudes

The aeronautical cartographic service provider shall show the area minimum altitudes within quadrilaterals formed by the parallels and meridians.

86. Air traffic services system

(1) The aeronautical cartographic service provider shall show on the Area Chart the components of the established relevant air traffic services system.

- (2) The components referred to in subregulation (1) include—
 - (a) the radio navigation aids associated with the air traffic services system, together with their names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds;
 - (b) in respect of DME, additionally the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
 - (c) terminal radio aids which are required for outbound and inbound traffic and for holding patterns;
 - (d) the lateral and vertical limits of all designated airspace and the appropriate class of airspace;
 - (e) the designation of the navigation specifications including any limitations, where established;
 - (f) holding patterns and terminal routings, together with the route designators, and the track to the nearest degree along each segment of the prescribed airways and terminal routings;

- (g) all significant points which define the terminal routings and are not marked by the position of a radio navigation aid, together with their name-codes and geographical coordinates in degrees, minutes and seconds;
- (h) in respect of waypoints defining VOR or DME area navigation routes, additionally—
 - (i) the station identification and radio frequency of the reference VOR/DME; and
 - (ii) the bearing to the nearest tenths of a degree and the distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference VOR/DME, if the waypoint is not collocated with it;
- (i) an indication of all compulsory and “on-request” reporting points;
- (j) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
- (k) change-over points on route segments defined by reference to very high frequency omnidirectional radio ranges, indicating the distances to the nearest kilometre or nautical mile to the radio navigation aids;
- (l) minimum en-route altitudes and minimum obstacle clearance altitudes, on ATS routes to the nearest higher 50 metres or 100 feet ;
- (m) established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;
- (n) area speed and level or altitude restrictions where established;

- (o) communication facilities listed with their channels and, if applicable, logon address and SATVOICE number; and
- (p) an indication of “flyover” significant points.

PART IX— STANDARD DEPARTURE CHART—INSTRUMENT (SID)

87. Function of Standard Departure Chart-Instrument

The aeronautical cartographic service provider shall ensure that the Standard Departure Chart-Instrument provides the flight crew with information to enable it to comply with the designated standard departure route instrument from take-off phase to the en-route phase.

88. Availability of SID

The aeronautical cartographic service provider shall make available the Standard Departure Chart- Instrument (SID) wherever standard departure route-instrument has been established and cannot be shown with sufficient clarity on the Area Chart.

89. Coverage and scale of SID

The aeronautical cartographic service provider shall—

- (a) ensure that the coverage of the Standard Departure Chart-Instrument is sufficient to indicate the point where the departure route begins and the specified significant point at which the en-route phase of flight along a designated air traffic services route can be commenced;
- (b) draw the Standard Departure Chart-Instrument to scale and show a scale-bar; and
- (c) use the annotation “NOT TO SCALE” and the symbol for scale break on tracks and other aspects of the Standard Departure Chart-Instrument chart which are too large to be drawn to scale, when the chart is not drawn to scale.

90. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle on a Standard Departure Chart-Instrument;
- (b) show the parallels and meridians at suitable intervals when the Standard Departure Chart-Instrument is drawn to scale; and
- (c) place the graduation marks at consistent intervals along the neat lines.

91. Identification

The aeronautical cartographic service provider shall identify the chart by the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the identification of the standard departure route- instrument as established in accordance with the Procedures for Air Navigation Services- Aircraft Operations (PANS OPS, DOC 8168) Volume II.

92. Culture and topography

The aeronautical cartographic service provider shall—

- (a) show the generalised shore lines of all open water areas, large lakes and rivers where the chart is drawn to scale except where they conflict with data more applicable to the function of the chart;
- (b) draw the chart to scale and show all relief exceeding 300 metres (1000ft) above the aerodrome elevation by smoothed contour lines, contour values and layer tints printed in brown in areas where significant relief exists; and
- (c) show appropriate spot elevations, including the highest elevation within each top contour line, printed in black and show obstacles.

93. Magnetic variation

The aeronautical cartographic service provider shall indicate the magnetic variation used in determining the magnetic bearings, tracks and radials to the nearest degree.

94. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that bearings, tracks and radials are magnetic and the bearings and tracks are shown in parentheses to the nearest tenth of a degree where bearings and tracks are additionally provided as true values for RNAV segments; and
- (b) clearly indicate where bearings, tracks and radials are given with reference to True North or Grid North and identify the reference grid meridian when Grid North is used.

Aeronautical Data

95. Aerodromes

The aeronautical cartographic service provider shall—

- (a) show the runway pattern for the aerodrome of departure;
- (b) show and identify all aerodromes which affect the designated standard departure route- instrument and where appropriate, the aerodrome runway patterns.

96. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall depict the prohibited, restricted and danger areas with their identification and vertical limits on the Standard Departure Chart-Instrument which may affect the execution of the procedures.

97. Minimum sector altitude

The aeronautical cartographic service provider shall—

- (a) show the established minimum sector altitude on the Standard Departure Chart-Instrument with a clear indication of the sector to which minimum sector altitude applies;

- (b) draw the Standard Departure Chart-Instrument to scale and show the area minimum altitudes within quadrilaterals formed by the parallels and meridians; and
- (c) show the area minimum altitudes in those parts of the chart not covered by the minimum sector altitude where the minimum sector altitude has not been established.

98. Air traffic services system

(1) The aeronautical cartographic service provider shall show the components of the established relevant air traffic services system on the Standard Departure Chart-Instrument.

(2) The components of the air traffic services system referred to in subregulation (1) include—

- (a) a graphic portrayal of each standard departure route-instrument, including—
 - (i) for departure procedures designed specifically for helicopters the term “CAT H” shall be depicted in the departure chart plan view;
 - (ii) route designator;
 - (iii) significant points defining the route;
 - (iv) track or radial to the nearest degree along each segment of the route;
 - (v) distance to the nearest kilometer or nautical mile between significant points;
 - (vi) minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50m or 100ft and flight level restrictions where established; and
 - (vii) where the chart is drawn to scale and vectoring on departure is provided, established minimum

vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

- (b) the radio navigation aid associated with the routes including—
 - (i) when the radio navigation aid is used for conventional navigation—
 - (a) plain language name;
 - (b) identification;
 - (c) Morse Code;
 - (d) frequency;
 - (e) geographical coordinates in degrees, minutes and seconds;
 - (f) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 m (100 ft);
 - (ii) when the radio navigation aid is used as a significant point for area navigation—
 - (a) plain language name; and
 - (b) identification;
 - (c) significant points not marked by the position of a radio navigation aid including—
 - (i) when the significant point is used for conventional navigation—
 - (a) name-code;
 - (b) geographical coordinates in degrees, minutes and seconds;
 - (c) bearing to the nearest tenth of a degree from the reference radio navigation aid;

- (d) distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid; and
 - (e) identification of the reference radio navigation aid;
 - (ii) when the significant point is used for area navigation, name-code;
- (d) applicable holding patterns;
- (e) transition altitude or height to the nearest higher 300 metres or 1,000 feet;
- (f) the position and height of close-in obstacles which penetrate the obstacle identification surface (OIS) and a note is included whenever close-in obstacles penetrating the OIS exist but which were not considered for the published procedure design gradient;
- (g) area speed restrictions, where established;
- (h) the designation of the navigation specifications including any limitations, where established;
 - (i) all compulsory and “on-request” reporting points;
 - (ii) radio communication procedures, including—
 - (a) call signs of ATS units;
 - (b) frequency and if applicable, SATVOICE number;
 - (c) transponder setting, where appropriate; and
 - (i) an indication of “flyover” significant points.

(3) The aeronautical cartographic service provider shall provide a textual description of standard departure route- instrument and relevant communication failure procedures and whenever feasible, on the chart or on the same page which contains the chart.

99. Aeronautical database requirements

The aeronautical cartographic service provider shall publish the appropriate data to support navigation database coding in accordance with the Procedures for Air Navigation Services-Aircraft Operations (PANS-OPS, Doc 8168), Volume II, on the verso of the chart or as a separate, properly referenced sheet.

PART X—STANDARD ARRIVAL CHART-INSTRUMENT (STAR)

100. Function of Standard Arrival Chart-Instrument

The aeronautical cartographic service provider shall ensure that the Standard Arrival Chart-Instrument provides information to enable the flight crew to comply with the designated standard arrival route instrument from the en-route phase to the approach phase.

101. Availability of Standard Arrival Chart-Instrument.

The aeronautical cartographic service provider shall make available the Standard Arrival Chart- Instrument (STAR) wherever a standard arrival route-instrument has been established and cannot be shown with sufficient clarity on the Area Chart.

102. Coverage and scale of Standard Arrival Chart-Instrument.

The aeronautical cartographic service provider shall—

- (a) ensure that the coverage of the Standard Arrival Chart-Instrument is sufficient to indicate the points where the en-route phase ends and the approach phase begins;
- (b) draw the chart to scale and show a scale-bar; and
- (c) use the annotation “NOT TO SCALE” and the symbol for scale break on tracks and other aspects of the Standard Arrival Chart-Instrument which are too large to be drawn to scale, when the chart is not drawn to scale.

103. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle;
- (b) show the parallels and meridians at suitable intervals when the chart is drawn to scale; and
- (c) place the graduation marks at consistent intervals along the neat lines.

104. Identification

The aeronautical cartographic service provider shall identify the Standard Arrival Chart-Instrument chart by the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the identification of the standard arrival route- instrument as established in accordance with the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II.

105. Culture and topography

The aeronautical cartographic service provider shall—

- (a) show the generalised shore lines of all open water areas, large lakes and rivers where the chart is drawn to scale, except where they conflict with data more applicable to the function of the Standard Arrival Chart-Instrument;
- (b) draw the STAR to scale and show all relief exceeding 300 metres (1000 feet) above the aerodrome elevation by smoothed contour lines, contour values and layer tints printed in brown in areas where significant relief exists; and
- (c) show the appropriate spot elevations, including the highest elevation within each top contour line, printed in black and show the obstacles.

106. Magnetic variation

The aeronautical cartographic service provider shall show the magnetic variation used in determining the magnetic bearings, tracks and radials to the nearest degree.

107. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that the bearings, tracks and radials are magnetic and show the bearings and tracks in parentheses to the nearest tenth of a degree where bearings and tracks are additionally provided as true values for RNAV segments; and
- (b) indicate clearly the bearings, tracks and radials where bearings, tracks or radials are given with reference to True North or Grid North and identify the reference grid meridian when Grid North is used.

Aeronautical Data.

108. Aerodromes

The aeronautical cartographic service provider shall—

- (a) show the runway pattern for the aerodrome of landing; and
- (b) show and identify all aerodromes which affect the designated standard arrival route-instrument and where appropriate, the aerodrome runway patterns.

109. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall depict the prohibited, restricted and danger areas with their identification and vertical limits on the Standard Arrival Chart-Instrument which may affect the execution of the procedures.

110. Minimum sector altitude

The aeronautical cartographic service provider shall—

- (a) show the established minimum sector altitude on the Standard Arrival Chart-Instrument with a clear indication of the sector to which minimum sector altitude applies;

- (b) draw the Standard Arrival Chart-Instrument to scale and show the area minimum altitude within quadrilaterals formed by the parallels and meridians where the minimum sector altitude has not been established; and
- (c) show the area minimum altitudes in those parts of the chart not covered by the minimum sector altitude.

111. Air traffic services system

(1) The aeronautical cartographic service provider shall show the components of the established relevant air traffic services system on the Standard Arrival Chart-Instrument.

(2) The components of the air traffic services system referred to in subregulation (1) shall include—

- (a) a graphic portrayal of each standard arrival route-instrument, including—
 - (i) route designator;
 - (ii) significant points defining the route;
 - (iii) track or radial to the nearest degree along each segment of the route;
 - (iv) distances to the nearest kilometer or nautical mile between significant points;
 - (v) minimum obstacle clearance altitudes, along the route or route segments and altitudes required by the procedure to the nearest higher 50m or 100ft and flight level restrictions, where established; and
 - (vi) where the chart is drawn to scale and vectoring on arrival is provided, established minimum vectoring altitudes to the nearest higher 50 m or 100 ft, clearly identified;

- (b) the radio navigation aids associated with the routes including—
 - (i) when the radio navigation aid is used for conventional navigation—
 - (a) plain language name;
 - (b) identification;
 - (c) Morse code
 - (d) frequency;
 - (e) geographical coordinates in degrees, minutes and seconds; and
 - (f) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest 30 metres (100 feet);
 - (ii) when the radio navigation aid is used as a significant point for area navigation—
 - (a) plain language name; and
 - (b) identification
 - (c) significant points not marked by the position of a radio navigation aid including:
 - (i) when the significant point is used for conventional navigation:
 - (a) name-code;
 - (b) geographical coordinates in degrees, minutes and seconds;
 - (c) bearing to the nearest tenth of a degree from the reference radio navigation aid;
 - (d) distance to the nearest two-tenths of a kilometre (tenth of a nautical mile) from the reference radio navigation aid; and

- (e) identification of the reference radio navigation aid;
- (ii) when the significant point is used for area navigation, name-code;
- (d) applicable holding patterns;
- (e) transition altitude or height to the nearest higher 300m or 1 000ft;
- (f) area speed restrictions, where established;
- (g) the designation of the navigation specifications including any limitations, where established;
- (h) all compulsory and “on-request” reporting points;
- (i) radio communication procedures, including—
 - (a) call signs of air traffic services units;
 - (b) frequency and if applicable, SATVOICE number;
 - (c) transponder setting, where appropriate;
- (j) an indication of “flyover” significant points; and
- (k) for arrival procedures to an instrument approach designed specifically for helicopters, the term “CAT H” shall be depicted in the arrival chart plain view.

(3) The aeronautical cartographic service provider shall provide a textual description of standard arrival route- instrument and relevant communication failure procedures and whenever feasible, on the chart or on the same page which contains the chart.

112. Aeronautical database requirements

The aeronautical cartographic service provider shall publish the appropriate data to support navigation database coding in accordance with the Procedures for Air Navigation Services-Aircraft Operations (PANS-OPS, Doc 8168), Volume II, on the verso of the chart or as a separate, properly referenced sheet.

113. Function of Instrument Approach Chart

The aeronautical cartographic service provider shall ensure that the Instrument Approach Chart provides flight crews with information to enable them perform an approved instrument approach procedure to the runway of intended landing including the missed approach procedure and where applicable, associated holding patterns.

114. Availability of Instrument Approach Chart

The aeronautical cartographic service provider shall—

- (a) make available the Instrument Approach Charts for all aerodromes used by international civil aviation where instrument approach procedures have been established by the Authority;
- (b) provide a separate Instrument Approach Chart for each precision approach procedure established by the Authority;
- (c) provide a separate Instrument Approach Chart for each non-precision approach procedure established by the Authority;
- (d) provide more than one Instrument Approach Chart when the values for track, time or altitude differ between categories of aircraft other than the final approach segment of the instrument approach procedures and the listing of these differences on a single chart could cause clutter or confusion; and
- (e) revise the instrument Approach Charts whenever information essential to safe operation becomes out of date.

115. Coverage and scale of Instrument Approach Chart

The aeronautical cartographic service provider shall—

- (a) ensure that the coverage of the Instrument Approach Chart is sufficient to include all segments of the instrument approach procedure and such additional areas as may be necessary for the type of approach intended;

- (b) select the scale that ensures optimum legibility consistent with—
 - (i) the procedure shown on the chart; and
 - (ii) sheet size;
- (c) indicate the scale used;
- (d) indicate a distance circle with a radius of 20km (10NM) centered on a DME located on or close to the aerodrome, or on the aerodrome reference point where no suitable DME is available and the radius of the DME on the circumference, except where this is not practicable; and
- (e) indicate a distance scale directly below the profile.

116. Format of Instrument Approach Chart

The aeronautical cartographic service provider shall publish an Instrument Approach Chart on a sheet size of 210 × 297 mm (8.27 x 11.69 inches) (A4).

117. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle; and
- (b) place the graduation marks at consistent intervals along the neat lines on the Instrument Approach Chart.

118. Identification

The aeronautical cartographic service provider shall identify the Instrument Approach Chart by the name of the city or town or area which the aerodrome serves, the name of the aerodrome and the identification of the instrument approach procedure as established in accordance with the Procedures for Air Navigation Services-Aircraft Operations (PANS-OPS, Doc 8168), Volume II.

119. Culture and topography

The aeronautical cartographic service provider shall—

- (a) indicate the culture and topographic information pertinent to the safe execution of the instrument approach procedure, including the missed approach procedure, associated holding procedures and visual maneuvering procedure, when established;
- (b) indicate the topographic information, only when necessary to facilitate the understanding of that information and the minimum delineation of land masses and significant lakes and rivers;
- (c) indicate the relief in a manner best suited to the elevation characteristics of the area;
- (d) indicate all relief exceeding 150m (500ft) above the aerodrome elevation by smoothed contour lines, contour values and layer tints printed in brown, in areas where relief exceeds 1200m (4000ft) above the aerodrome elevation within the coverage of the chart or 600m (2000ft) within 11 km (6 NM) of the aerodrome reference point or when final approach or missed approach procedure gradient is steeper than optimal due to terrain;
- (e) indicate the appropriate spot elevations, including the highest elevation within each top contour line and printed in black; and
- (f) indicate in areas where relief is lower than that specified in paragraph (d), all relief exceeding 150m (500ft) above the aerodrome elevation by smoothed contour lines, contour values and layer tints printed in brown and appropriate spot elevations, including the highest elevation within each top contour line, printed in black.

120. Magnetic variation

The aeronautical cartographic service provider shall—

- (a) indicate the magnetic variation on the Instrument Approach Chart; and
- (b) indicate the value of the variation, to the nearest degree, used in determining magnetic bearings, tracks and radials.

121. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that the bearings, tracks and radials are magnetic;
- (b) indicate the bearings and tracks in parentheses to the nearest tenth of a degree where bearings and tracks are additionally provided as true values for RNAV segments;
- (c) clearly indicate the bearings, tracks and radials where bearings, tracks or radials are given with reference to True North or Grid North; and
- (d) identify the reference grid meridian when Grid North is used.

Aeronautical Data

122. Aerodromes

The aeronautical cartographic service provider shall—

- (a) identify all aerodromes which show a distinctive pattern from the air on the Instrument Approach Chart by the appropriate symbol and abandoned aerodromes as abandoned.
- (b) identify the runway pattern, at a scale sufficiently large to show it clearly for—
 - (i) the aerodrome on which the procedure is based;
 - (ii) aerodromes affecting the traffic pattern or so situated as to be likely, under adverse weather conditions, to be mistaken for the aerodrome of intended landing;

- (c) indicate the aerodrome elevation to the nearest foot in a prominent position on the chart; and
- (d) indicate the threshold elevation or where applicable, the highest elevation of the touchdown zone to the nearest foot.

123. Obstacles

The aeronautical cartographic service provider shall—

- (a) indicate the obstacles on the plan view of the Instrument Approach Chart;
- (b) identify the obstacles, if one or more obstacles are the determining factor of an obstacle clearance altitude or height;
- (c) indicate the elevation of the top of obstacles to the nearest foot;
- (d) indicate the heights of obstacles above a datum other than mean sea level in parentheses on the chart when shown;
- (e) indicate the datum as the aerodrome elevation when the heights of obstacles above a datum other than mean sea level are shown, except that, at aerodromes having an instrument runway with a threshold elevation more than 7ft below the aerodrome elevation, the chart datum is the threshold elevation of the runway to which the instrument approach is related;
- (f) indicate the datum in a prominent position on the chart, where a datum other than mean sea level is used; and
- (g) indicate the obstacle free zone, where an obstacle free zone has not been established for a precision approach runway Category I.

124. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall indicate on the Instrument Approach Chart the prohibited areas, restricted areas and

danger areas which may affect the execution of the procedures and their identification and vertical limits.

125. Radio communication facilities and navigation aids

The aeronautical cartographic service provider shall—

- (a) indicate on the Instrument Approach Chart the radio navigation aids required for the procedures together with their frequencies, identifications and track-defining characteristics, if any;
- (b) identify the facility to be used for track guidance for final approach in the case of a procedure in which more than one station is located on the final approach track;
- (c) eliminate from the approach chart the facilities that are not used by the procedure;
- (d) when a radio navigation aid is used as a significant point for area navigation, only its plain language name and identification shall be shown.
- (e) indicate the initial approach fix, the intermediate approach fix, the final approach fix or final approach point for an ILS approach procedure, the missed approach point, where established, and other essential fixes or points comprising the procedure;
- (f) when the final approach fix is used for final conventional navigation (or final approach point for an ILS approach procedure) it should be identified with its geographical coordinates in degrees, minutes and seconds;
- (g) indicate on the chart the radio navigation aids that might be used in diversionary procedures together with their track- defining characteristics, if any;
- (h) indicate the radio communication frequencies, including call signs that are required for the execution of the procedures;

- (i) indicate on the chart the distance to the aerodrome from each radio navigation aid concerned with the final approach to the nearest kilometre or nautical mile when required by the procedures; and
- (j) indicate the bearing to the nearest degree, when no track-defining aid indicates the bearing of the aerodrome.

126. Minimum sector altitude or terminal arrival altitude

The aeronautical cartographic service provider shall indicate on the Instrument Approach Chart the minimum sector altitude or terminal arrival altitude established, with a clear indication of the sector to which the minimum sector altitude or terminal arrival altitude applies.

127. Portrayal of procedure tracks

The aeronautical cartographic service provider shall—

- (a) provide the plan view of the Instrument Approach Chart shows the following information in the manner indicated—
 - (i) the approach procedure track by an arrowed continuous line indicating the direction of flight;
 - (ii) the missed approach procedure track by an arrowed broken line;
 - (iii) any additional procedure track, other than those specified in subparagraphs (i) and (ii), by an arrowed dotted line;
 - (iv) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or tenth of a nautical mile or times required for the procedure;
 - (v) where no track-defining aid is available, the magnetic bearing to the nearest degree to the aerodrome from the radio navigation aids concerned with the final approach;

- (vi) the boundaries of any sector in which visual maneuvering is prohibited;
 - (vii) where specified, the holding pattern and minimum holding altitude or height associated with the approach and missed approach;
 - (viii) caution notes where required, prominently displayed on the face of the chart; and
 - (ix) an indication of “flyover” significant points;
- (b) ensure that the plan view shows the distance to the aerodrome from each radio navigation aid concerned with the final approach;
- (c) provide a profile below the plan view showing the following data—
- (i) the aerodrome by a solid block at aerodrome elevation;
 - (ii) the profile of the approach procedure segments by an arrowed continuous line indicating the direction of flight;
 - (iii) the profile of the missed approach procedure segment by an arrowed broken line and a description of the procedure;
 - (iv) the profile of any additional procedure segment, other than those specified in subparagraphs (ii) and (iii), by an arrowed dotted line;
 - (v) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or tenth of a nautical mile or times required for the procedure;

- (vi) altitudes or heights required by the procedures, including transition altitude and procedure altitudes or heights and heliport crossing height (HCH) where established;
 - (vii) limiting distance to the nearest kilometre or nautical mile on procedure turn, when specified;
 - (viii) the intermediate approach fix or point, on procedures where no course reversal is authorised;
 - (ix) a line representing the aerodrome elevation or threshold elevation, as appropriate, extended across the width of the chart including a distance scale with its origin at the runway threshold;
- (d) indicate the heights required by procedures in parentheses, using the height datum selected in accordance with regulation 123 (e);
- (e) provide a profile view including a ground profile or a minimum altitude or height portrayal as follows —
- (i) a ground profile shown by a solid line depicting the highest elevations of the relief occurring within the primary area of the final approach segment and the highest elevations of the relief occurring in the secondary areas of the final approach segment shown by a dashed line; or
 - (ii) the minimum altitudes or heights in the intermediate and final approach segments indicated within bounded shaded blocks.

128. Aerodrome operating minima

The aeronautical cartographic service provider shall—

- (a) indicate the aerodrome operating minima when established;

- (b) indicate the obstacle clearance altitudes or heights for the aircraft categories for which the procedure is designed;
- (c) publish for precision approach procedures, the OCA/H for Cat DL aircraft of wing span between 65m and 80m and vertical distance between the flight path of the wheels and the glide path antenna between 7m and 8m, when necessary.

129. Supplementary information

The aeronautical cartographic service provider shall—

- (a) where the missed approach point is defined by—
 - (i) a distance from the final approach fix; or
 - (ii) a facility or a fix and the corresponding distance from the final approach fix, show the distance to the nearest two-tenths of a kilometer or tenth of a nautical mile and a table showing ground speeds and times from the final approach fix to the missed approach point;
- (b) indicate a table showing altitudes or heights for each 2 km or 1 NM as appropriate when DME is required for use in the final approach segment and the table does not include distances which would correspond to altitudes or heights below the OCA/H;
- (c) include a table showing the altitudes or heights for procedures in which DME is not required for use in the final approach segment but where a suitably located DME is available to provide advisory descent profile information;
- (d) indicate a rate of descent table;
- (e) indicate the final approach descent gradient to the nearest one-tenth of a percent and, in parentheses, descent angle to the nearest one-tenth of a degree for non-precision approach procedures with a final approach fix;

- (f) indicate the reference datum height to the nearest half metre or foot and the glide path or elevation or vertical path angle to the nearest one-tenth of a degree for precision approach procedures and approach procedures with vertical guidance;
- (g) give a clear indication whether it applies to the ILS, the associated ILS localizer only procedure or both, when a final approach fix is specified at the final approach point for ILS;
- (h) in the case of MLS, give a clear indication when a final approach fix (FAF) has been specified at the final approach point;
- (i) include a cautionary note, if the final approach descent gradient or angle for any type of instrument approach procedure exceeds the maximum value specified in the Procedures for Air Navigation Services-Aircraft (PANS-OPS, Doc 8168), Vol II; and
- (j) A note shall be included on the chart indicating the approach procedures that are authorised for simultaneous independent or dependent operations. The note shall include the runway(s) involved and if they are closely spaced.

130. Aeronautical database requirements

The aeronautical cartographic service provider shall publish appropriate data to support navigation database coding in accordance with the Procedures for Air Navigation Services -Aircraft Operations (PANS-OPS, Doc 8168), Volume II, for non-RNAV procedures, on the verso of the chart or as a separate, properly referenced sheet.

PART X—VISUAL APPROACH CHART

131. Function of Visual Approach Chart

The aeronautical cartographic service provider shall ensure that the Visual Approach Chart provides information to enable the flight crew to transit from the en-route or descent to approach phases of flight to the runway of intended landing by means of visual reference.

132. Availability of Visual Approach Chart

The aeronautical cartographic service provider shall make available the Visual Approach Chart in the manner specified in regulation 4(b) for all aerodromes used by international civil aviation where—

- (a) only limited navigation facilities are available;
- (b) radio communication facilities are not available;
- (c) no adequate aeronautical charts of the aerodrome and its surroundings at 1:500,000 or greater scale are available; or
- (d) visual approach procedures have been established.

133. Scale of Visual Approach Chart

The aeronautical cartographic service provider shall—

- (a) ensure that the scale on a Visual Approach Chart is sufficiently large to permit depiction of significant features and indication of the aerodrome layout;
- (b) not use a scale smaller than 1:500 000; and
- (c) draw the Visual Approach Chart to the same scale, when an Instrument Approach Chart is available for a given aerodrome.

134. Format of Visual Approach Chart

The aeronautical cartographic service provider shall draw the Visual Approach Chart on a sheet size of 210 × 297 mm (8.27 x 11.69 inches) (A4).

135. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a great circle; and
- (b) place the graduation marks at consistent intervals along the neat lines.

136. Identification

The aeronautical cartographic service provider shall identify the Visual Approach Chart by the name of the city or town which the aerodrome serves and the name of the aerodrome.

137. Culture and topography

The aeronautical cartographic service provider shall—

- (a) indicate the natural and cultural landmarks on the Visual Approach Chart;
- (b) include the geographical place names only when they are required to avoid confusion or ambiguity;
- (c) indicate the shore lines, lakes, rivers and streams on the Visual Approach Chart;
- (d) indicate the relief on the chart in a manner best suited to the elevation and obstacle characteristics of the area covered by the chart;
- (e) ensure that the spot elevations are carefully selected when shown; and
- (f) distinguish the presentation of the figures relating to different reference levels.

138. Magnetic variation

The aeronautical cartographic service provider shall indicate the magnetic variation on the Visual Approach Chart.

139. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) provide the bearings, tracks and radials as magnetic;
- (b) ensure that the bearings, tracks or radials are clearly indicated where given with reference to True North or Grid North; and
- (c) identify the reference grid meridian when Grid North is used.

140. Aerodromes

The aeronautical cartographic service provider shall—

- (a) indicate all aerodromes on the Visual Approach Chart by the runway pattern;
- (b) indicate the restrictions on the use of any landing direction;
- (c) indicate where there is any risk of confusion between two neighbouring aerodromes;
- (d) identify the abandoned aerodromes as abandoned; and
- (e) indicate the aerodrome elevation in a prominent position on the chart.

141. Obstacles

The aeronautical cartographic service provider shall—

- (a) show and identify the obstacles;
- (b) indicate the elevation of the top of obstacles to the nearest next higher metre or foot;
- (c) indicate the heights of obstacles above the aerodrome elevation; and
- (d) when the heights of obstacles are shown, specify the height datum in a prominent position on the chart and give the heights in parentheses on the chart.

142. Prohibited, restricted and danger areas.

The aeronautical cartographic service provider shall depict the prohibited areas, restricted areas and danger areas on the chart together with their identification and vertical limits.

143. Designated airspace

The aeronautical cartographic service provider shall depict the control zones and aerodrome traffic zones and their vertical limits and the appropriate class of airspace, where applicable.

144. Visual approach information

The aeronautical cartographic service provider shall—

- (a) indicate the visual approach procedures, where applicable;
- (b) indicate the visual aids for navigation as appropriate; and
- (c) indicate the location and type of the visual approach slope indicator systems with their nominal approach slope angle, minimum eye height over the threshold of the on-slope signal and where the axis of the system is not parallel to the runway centre line, the angle and direction of displacement, either left or right.

145. Supplementary information for Visual Approach Chart

The aeronautical cartographic service provider shall—

- (a) indicate on the Visual Approach Chart, the radio navigation aids together with their frequencies and identifications as appropriate; and
- (b) indicate the radio communication facilities with their frequencies as appropriate.

PART XIII—AERODROME OR HELIPORT CHART

146. Function of Aerodrome or Heliport Chart

The aeronautical cartographic service provider shall—

- (a) ensure that the Aerodrome Chart provides flight crews with information to facilitate the ground movement of aircraft—
 - (i) from the aircraft stand to the runway; and
 - (ii) from the runway to the aircraft stand;
- (b) ensure that the Heliport Chart provides flight crews with information to facilitate the helicopter movement —
 - (i) from the helicopter stand to the touchdown and lift-off area and to the final approach and take-off area;

- (ii) from the final approach and take-off area to the touchdown and lift-off area and to the helicopter stand;
 - (iii) along helicopter ground and air taxiways; and
 - (iv) along air transit routes;
- (c) ensure that the Aerodrome or Heliport chart provides essential operational information at the aerodrome or heliport.

147. Availability of Aerodrome or Heliport Chart

The aeronautical cartographic service provider shall make available the Aerodrome or Heliport Chart in the manner specified in regulation 4(b) for all aerodromes or heliports regularly used or available for use by international civil aviation.

148. Coverage and scale of Aerodrome or Heliport Chart

The aeronautical cartographic service provider shall ensure that the coverage and scale of Aerodrome or Heliport Chart are sufficiently large to show clearly all the elements listed in regulation 151(1) on a linear scale.

149. Identification

The aeronautical cartographic service provider shall identify the chart by the name of the city or town or area which the aerodrome or heliport serves and the name of the aerodrome or heliport.

150. Magnetic variation

The aeronautical cartographic service provider shall indicate the True and Magnetic North arrows and magnetic variation to the nearest degree and annual change of the magnetic variation on the chart.

151. Aerodrome or heliport data

(1) The aeronautical cartographic service provider shall provide the Aerodrome or Heliport Chart showing the following data—

- (a) geographical coordinates in degrees, minutes and seconds for the aerodrome or heliport reference point;

- (b) elevations, to the nearest foot, of the aerodrome or heliport and apron (altimeter checkpoint locations) where applicable; and for non-precision approaches, elevations and geoid undulations of runway thresholds and the geometric centre of the touchdown and lift-off area;
- (c) elevations and geoid undulations, to the nearest foot, of the precision approach runway threshold, the geometric centre of the touchdown and lift-off area and at the highest elevation of the touchdown zone of a precision approach runway;
- (d) all runways including those under construction with designation number, length and width to the nearest metre, bearing strength, displaced thresholds, stopways, clearways, runway directions to the nearest degree magnetic, type of surface and runway markings;
- (e) all aprons, with aircraft or helicopter stands, lighting, markings and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems, type of surface for heliports and bearing strengths or aircraft type restrictions where the bearing strength is less than that of the associated runways;
- (f) the geographical coordinates in degrees, minutes and seconds for thresholds, geometric centre of touchdown and lift-off area or thresholds of the final approach and take-off area (where appropriate);
- (g) all taxiways, helicopter air and ground taxiways with type of surface, helicopter air transit routes, with designations, width, lighting, markings (including runway-holding positions and where established, intermediate holding positions), stop bars, other visual guidance and control aids and bearing strength or aircraft type restrictions where the bearing strength is less than that of the associated runways;

- (h) where established, hot spot locations with additional information properly annotated;
- (i) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points and aircraft stands;
- (j) where established, standard routes for taxiing aircraft with their designators;
- (k) the boundaries of the air traffic control service;
- (l) position of runway visual range (RVR) observation sites;
- (m) approach and runway lighting;
- (n) location and type of the visual approach slope indicator systems with their nominal approach slope angle, minimum eye height over the threshold of the on-slope signal, and where the axis of the system is not parallel to the runway centre line, the angle and direction of the displacement;
- (o) relevant communication facilities listed with their channels and, if applicable, logon address;
- (p) obstacles to taxiing;
- (q) aircraft servicing areas and buildings of operational significance;
- (r) VOR checkpoint and radio frequency of the aid concerned; and
- (s) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

(2) For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended should be shown on the chart.

(3) In addition to the requirements in subregulation (1) relating to heliports, the chart shall show—

- (a) heliport type;

- (b) touchdown and lift-off area including dimensions to the nearest metre, slope, type of surface and bearing strength in tonnes;
- (c) final approach and take-off area including type, true bearing to the nearest degree, designation number (where appropriate), length and width to the nearest metre, slope and type of surface;
- (d) safety area including length, width and type of surface;
- (e) helicopter clearway including length and ground profile;
- (f) obstacles including type and elevation of the top of the obstacles to the nearest foot;
- (g) visual aids for approach procedures, marking and lighting of final approach and take-off area, and of touchdown and lift-off area;
- (h) declared distances to the nearest metre for heliports, where relevant, including —
 - (i) take-off distance available;
 - (ii) rejected take-off distance available; and
 - (iii) landing distance available.

PART XIV—AERODROME GROUND MOVEMENT CHART

152. Function of Aerodrome Ground Movement Chart

The aeronautical cartographic service provider shall ensure that the Aerodrome Ground Movement Chart provides flight crew with detailed information to facilitate the ground movement of aircraft to and from the aircraft stands and the parking of aircraft.

153. Availability of Aerodrome Ground Movement Chart

The aeronautical cartographic service provider shall make available the Aerodrome Ground Movement Chart in the manner specified

in regulation 4(b) where, due to congestion of information, details necessary for the ground movement of aircraft along the taxiways to and from the aircraft stands cannot be shown with sufficient clarity on the Aerodrome or Heliport Chart.

154. Coverage and scale of Aerodrome Ground Movement Chart

The aeronautical cartographic service provider shall ensure that the coverage and scale are sufficiently large to show clearly all the elements listed in regulation 157 and shall indicate a linear scale.

155. Identification

The aeronautical cartographic service provider shall identify the Aerodrome Ground Movement Chart by the name of the city or town or area which the aerodrome serves and the name of the aerodrome.

156. Magnetic variation

The aeronautical cartographic service provider shall indicate—

- (a) a True North arrow on the Aerodrome Ground Movement Chart; and
- (b) the magnetic variation to the nearest degree and the annual change of the magnetic variation.

157. Aerodrome data

(1) The aeronautical cartographic service provider shall provide the Aerodrome Ground Movement Chart. This chart shall show in a similar manner all the information on the Aerodrome/Heliport Chart — ICAO relevant to the area depicted, including—

- (a) apron elevation to the nearest metre or foot;
- (b) aprons with aircraft stands, bearing strengths or aircraft type restrictions, lighting, marking and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems;
- (c) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for aircraft stands;

- (d) taxiways with designations, width to the nearest metre, bearing strength or aircraft type restrictions where applicable, lighting, markings, stop bars and other visual guidance and control aids;
- (e) where established, hot spot locations with additional cartographic properly annotated;
- (f) where established, standard routes for taxiing aircraft, with their designators;
- (g) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points;
- (h) the boundaries of the air traffic control service;
- (i) relevant communication facilities listed with their channels and, if applicable, logon address;
- (j) obstacles to taxiing;
- (k) aircraft servicing areas and buildings of operational significance;
- (l) VOR checkpoint and radio frequency of the aid concerned; and
- (m) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

(2) For aerodromes accommodating aeroplanes with folding wing tips, the location where the wing tips may be safely extended should be shown on the chart.

PART XV—AIRCRAFT PARKING CHART

158. Function of Aircraft Parking Chart

The aeronautical cartographic service provider shall ensure that the Aircraft Parking Chart provides flight crew with detailed information to facilitate the ground movement of aircraft between the taxiways and the aircraft stands and the parking of aircraft.

159. Availability of Aircraft Parking Chart

The aeronautical cartographic service provider shall make available the Aircraft Parking Chart in the manner prescribed in regulation 4(2) where, due to the complexity of the terminal facilities, the information cannot be shown with sufficient clarity on the Aerodrome or Heliport Chart or on the Aerodrome Ground Movement Chart.

160. Coverage and scale of Aircraft Parking Chart

The aeronautical cartographic service provider shall ensure that the coverage and scale is sufficiently large to show clearly all the elements listed in regulation 163.

161. Identification

The aeronautical cartographic service provider shall identify the Aircraft Parking Chart by the name of the city or town or area which the aerodrome serves and the name of the aerodrome.

162. Magnetic variation

The aeronautical cartographic service provider shall indicate—

- (a) a True North arrow on the Aircraft Parking Chart; and
- (b) the magnetic variation to the nearest degree and its annual change.

163. Aerodrome data

The aeronautical cartographic service provider shall provide the Aircraft Parking Chart showing in a similar manner, all the information on the Aerodrome or Heliport Chart and the Aerodrome Ground Movement Chart relevant to the area depicted, including—

- (a) apron elevation to the nearest foot;
- (b) aprons with aircraft stands, bearing strengths or aircraft type restrictions, lighting, marking and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems;
- (c) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for aircraft stands;

- (d) taxiways entries with designations, including runway-holding positions and where established, intermediate holding positions and stop bars;
- (e) where established, hot spot locations with additional information properly annotated;
- (f) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line points;
- (g) the boundaries of the air traffic control service;
- (h) relevant communication facilities listed with their channels and if applicable, logon address;
- (i) obstacles to taxiing;
- (j) aircraft servicing areas and buildings of operational significance;
- (k) VOR checkpoint and radio frequency of the aid concerned; and
- (l) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such.

PART XVI—WORLD AERONAUTICAL CHART—1:1, 000, 000

164. Function of World Aeronautical Chart-1:1, 000, 000

The aeronautical cartographic service provider shall ensure that the World Aeronautical Chart 1:1, 000, 000 provides information to satisfy the requirements of visual air navigation—

- (a) as a basic aeronautical chart—
 - (i) when highly specialised charts are lacking visual information or do not provide essential data;
 - (ii) to provide complete world coverage at a constant scale with a uniform presentation of planimetric data;

- (iii) to produce other charts required by international civil aviation;
- (b) as a pre-flight planning chart.

165. Availability of World Aeronautical Chart -1:1, 000, 000

The aeronautical cartographic service provider shall—

- (a) make available the World Aeronautical Chart -1:1, 000,000 in the manner specified in regulation 4(b) for all areas delineated in Schedule 5 to these Regulations; and
- (b) ensure that the selection of a scale of other than 1:1 ,000, 000 is determined by regional agreement to ensure complete coverage of all land areas and adequate continuity in any one coordinated series.

166. Scales of World Aeronautical Chart 1:1, 000, 000

The aeronautical cartographic service provider shall—

- (a) indicate the linear scales for kilometres and nautical miles arranged with their zero points in the same vertical line in the margin in the following order —
 - (i) kilometres;
 - (ii) nautical miles;
- (b) ensure that the length of the linear scales represents at least 200 km (110 NM); and
- (c) indicate a conversion scale in metre or feet in the margin.

167. Format of World Aeronautical Chart -1:1, 000, 000

The aeronautical cartographic service provider shall—

- (a) ensure that the title and marginal notes on the World Aeronautical Chart-1:1, 000, 000 are in the English language;

- (b) ensure that the information regarding the number of the adjoining sheets and the unit of measurement expressing elevations is clearly visible when the sheet is folded;
- (c) ensure that the method of folding is as follows—
 - (i) fold the chart on the long axis near the mid-parallel of latitude; face out, with the bottom part of the chart face upward;
 - (ii) fold inward near the meridian and fold both halves backward in accordion folds;
- (d) ensure that the sheet lines conform with those shown in the index in Schedule 5 to these Regulations, whenever practicable;
- (e) notify ICAO for publication in the ICAO Aeronautical Chart Catalogue the sheet lines used;
- (f) provide overlaps by extending the chart area on the top and right side beyond the area given on the index;
- (g) ensure that the overlap area contain all aeronautical, topographical, hydrographical and cultural information; and
- (h) ensure that the overlaps extend up to 28 km (15 NM), if possible, from the limiting parallels and meridians of each chart to the neat line.

168. Projection

The aeronautical cartographic service provider shall—

- (a) ensure that between the equator and 80° , the projection is the Lambert conformal conic projection, in separate bands for each tier of charts and the standard parallels for each 4° band are 40 ' south of the northern parallel and 40 ' north of the southern parallel;

(b) show the graticules and graduations as follows —

(i) Parallels:

| Latitude | Distance between Parallels | Graduation on Parallels |
|----------|----------------------------|-------------------------|
| 0 to 72° | 30' | 1' |

(ii) Meridians:

| Latitude | Distance between Parallels | Graduation on Parallels |
|----------|----------------------------|-------------------------|
| 0 to 52° | 30' | 1' |

- (c) ensure that the graduation marks at 1' and 5' intervals extend away from the Greenwich Meridian and from the Equator and each 10' interval is shown by a mark on both sides of the graticule line;
- (d) ensure that the length of the graduation marks are approximately 1.3 mm (0.05 in) for the 1' intervals, and 2 mm (0.08 in) for the 5' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10' intervals;
- (e) ensure that all meridians and parallels shown are numbered in the borders of the chart;
- (f) ensure that each parallel is numbered within the body of the chart in such a manner that the parallel can be readily identified when the chart is folded; and
- (g) indicate the name and basic parameters of the projection in the margin.

169. Identification

The cartographic service provider shall ensure that sheet numbering on the World Aeronautical Chart-1:1, 000, 000 is in conformity with the index set out in Schedule 5 to these Regulations.

Culture and Topography

170. Built-up areas

The aeronautical cartographic service provider shall—

- (a) select and show the cities, towns and villages on the World Aeronautical Chart-1:1, 000, 000 according to their relative importance to visual air navigation; and
- (b) indicate the cities and towns of sufficient size by the outline of their built-up areas and not of their established city limits.

171. Railroads

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000 all railroads having landmark value and the important tunnels.

172. Highways and roads

The aeronautical cartographic service provider shall—

- (a) show the road systems on the World Aeronautical Chart-1:1,000, 000 in sufficient detail to indicate significant patterns from the air; and
- (b) not show the roads in built-up areas unless they can be distinguished from the air as definite landmarks.

173. Landmarks

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000 the natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation.

174. Political boundaries

The aeronautical cartographic service provider shall show the international boundaries on the World Aeronautical Chart-1:1, 000,000 and un-demarcated or undefined boundaries shall be distinguished by descriptive notes.

175. Hydrography

The aeronautical cartographic service provider shall—

- (a) indicate all water features compatible with the scale of the chart comprising shorelines, lakes, rivers and streams including those non-perennial in nature, salt lakes, glaciers and ice caps on the World Aeronautical Chart-1:1, 000, 000;
- (b) ensure that the tint covering large open water areas is kept very light; and
- (c) ensure that reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas, are shown by symbols when of significant landmark value.

176. Contours

The aeronautical cartographic service provider shall—

- (a) ensure that the contours are shown and the selection of intervals is governed by the requirement to depict clearly the relief features required in air navigation; and
- (b) indicate the values of the contours used.

177. Hypsometric tints

The aeronautical cartographic service provider shall—

- (a) ensure that the range of elevations for the tints is shown when hypsometric tints are used; and
- (b) indicate the scale of the hypsometric tints used on the World Aeronautical Chart-1:1, 000 in the margin.

178. Spot elevations

The aeronautical cartographic service provider shall—

- (a) indicate on the World Aeronautical Chart-1:1, 000 the spot elevations at selected critical points and ensure that

- the elevations selected are the highest in the immediate vicinity and indicate the top of a peak and ridge;
- (b) indicate on the World Aeronautical Chart-1:1, 000 the elevations in valleys and at lake surface level which are of special value to the visual air navigation and the position of each selected elevation is shown by a dot;
 - (c) indicate the elevation of the highest point on the chart and its geographical position to the nearest five minutes in the margin; and
 - (d) ensure that spot elevation of the highest point in any sheet is cleared of hypsometric tinting.

179. Incomplete or unreliable relief

The aeronautical cartographic service provider shall—

- (a) ensure that the areas that have not been surveyed for contour information are labelled “relief data incomplete”; and
- (b) indicate on the chart on which spot elevations are generally unreliable a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, as follows—

“Warning—the reliability of relief information on this chart is doubtful and elevations are used with caution.”

180. Escarpments

The aeronautical cartographic service provider shall indicate on the chart the escarpments when they are prominent landmarks or when cultural detail is very sparse.

181. Wooded areas

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000 wooded areas and the approximate extreme northern or southern limits of tree growth by a dashed black line and appropriate labels.

182. Date of topographic information

The aeronautical cartographic service provider shall indicate in the margin of the World Aeronautical Chart-1:1, 000, 000 the date of the latest information shown on the topographic base.

183. Magnetic variation

The aeronautical cartographic service provider shall indicate in the margin of the World Aeronautical Chart-1:1, 000, 000 the isogonic lines and the date of the isogonic information.

Aeronautical Data

184. General requirement

The aeronautical cartographic service provider shall ensure that the aeronautical data shown are kept to a minimum consistent with the use of the chart for visual navigation and the revision cycle.

185. Aerodromes

The aeronautical cartographic service provider shall ensure that—

- (a) the land and water aerodromes and heliports are shown on the World Aeronautical Chart-1:1, 000, 000 with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance;
- (b) the aerodrome elevation, the lighting available, the type of runway surface and the length of the longest runway or channel, shown in abbreviated form for each aerodrome in conformity with Schedule 1 to these Regulations, is indicated provided they do not cause undesirable clutter on the chart; and
- (c) the abandoned aerodromes which are still recognisable as aerodromes from the air are shown and identified as abandoned.

186. Obstacles

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000 the obstacles and the prominent transmission lines, permanent cable car installations and wind turbines, when considered of importance to visual flight.

187. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000 the prohibited, restricted and danger areas.

188. Air traffic services system

The aeronautical cartographic service provider shall—

- (a) ensure that significant elements of the air traffic services system including, where practicable, control zones, aerodrome traffic zones, control areas, flight information regions and other airspaces in which VFR flights operate are shown on the World Aeronautical Chart-1:1, 000,000 together with the appropriate class of airspace; and
- (b) show and properly identify the air defense identification zone, where appropriate.

189. Radio navigation aids

The aeronautical cartographic service provider shall show the radio navigation aids on the World Aeronautical Chart-1:1, 000,000 by the appropriate symbol and name, excluding their frequencies, coded designators, times of operation and other characteristics unless any or all the information shown is kept up to date by means of new editions of the chart.

190. Supplementary information

The aeronautical cartographic service provider shall indicate on the World Aeronautical Chart-1:1, 000, 000—

- (a) the aeronautical ground lights together with their characteristics or identifications or both;

- (b) the marine lights on outer prominent shoreline or isolated features of not less than 28 km (15 NM) visibility range where they are —
 - (i) not less distinguishable than more powerful marine lights in the vicinity;
 - (ii) readily distinguishable from other marine or other types of lights in the vicinity of built-up shoreline; and
 - (iii) the only lights of significance available.

Part XVII—AERONAUTICAL CHART—1:500,000

191. Function of Aeronautical Chart -1:500,000

The aeronautical cartographic service provider shall ensure that the Aeronautical Chart -1: 500,000 provides information to satisfy the requirements of visual air navigation for low speed, short or medium-range operations at low and intermediate altitudes.

192. Availability of Aeronautical Chart -1:500,000

The aeronautical cartographic service provider shall make available the Aeronautical Chart- 1:500, 000 in the manner specified in regulation 4(2) for all areas delineated in Schedule 6 to these Regulations.

193. Scales for Aeronautical Chart -1:500,000

The aeronautical cartographic service provider shall—

- (a) arrange the linear scales for kilometres and nautical miles in the following order—
 - (i) kilometres;
 - (ii) with their zero points in the same vertical line shown in the margin;
- (b) ensure that the length of the linear scale is not less than 200 mm (8 in); and
- (c) indicate a conversion scale in the margin.

194. Format of Aeronautical Chart -1:500,000

The aeronautical cartographic service provider shall—

- (a) indicate the title and marginal notes of the Aeronautical Chart -1:500,000 in the English language;
- (b) ensure that the information regarding the number of the adjoining sheets and the unit of measurement expressing elevation is clearly visible when the sheet is folded;
- (c) ensure that the method of folding is as follows —
 - (i) fold the chart on the long axis near the mid-parallel of latitude, face out, with the bottom part of the chart face upward;
 - (ii) fold inward near the meridian; and
 - (iii) fold both halves backward in accordion folds;
- (d) ensure that sheets are quarter sheets of the World Aeronautical Chart -1:1,000,000 whenever practicable;
- (e) include on the face of the chart or on the reverse side an appropriate index to adjacent sheets, showing the relationship between the two chart series;
- (f) provide overlaps by extending the chart area on the top and right side beyond the area given on the index;
- (g) ensure that overlap area in paragraph (f) contain all aeronautical, topographical, hydrographical and cultural information; and
- (h) ensure that overlap extends up to 15 km (8 NM), if possible, from the limiting parallels and meridians of each chart to the neat line.

195. Projection

The aeronautical cartographic service provider shall —

- (a) use a conformal projection;
- (b) use the projection of the World Aeronautical Chart -1:1,000, 000;

- (c) show the parallels at intervals of 30';
- (d) show the meridians at intervals of 30 ';
- (e) indicate the graduation marks at 1 ' intervals along each whole degree meridian and parallel, extending away from the Greenwich Meridian and from the Equator and each 10 interval by a mark on both sides of the graticule line;
- (f) ensure that the length of the graduation marks is approximately 1.3 mm (0.05 in) for the 1 ' intervals, and 2 mm (0.08 in) for the 5 ' intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10 ' intervals;
- (g) indicate the numbers of the meridians and parallels in the borders of the chart;
- (h) indicate the numbers of each meridian and parallel within the body of the chart whenever this data is required operationally; and
- (i) indicate the name and basic parameters of the projection in the margin.

196. Identification

The aeronautical cartographic service provider shall—

- (a) identify each sheet of the Aeronautical Chart -1:500,000 by a name of the principal town or of a main geographical feature appearing on the sheet;
- (b) identify the sheets of the Aeronautical Chart -1:500,000 by the reference number of the corresponding World Aeronautical Chart —1:1 000 000 where applicable, with the addition of one or more of the following letter suffixes indicating the quadrant or quadrants —

| Letter | Chart quadrant |
|--------|----------------|
| A | North-West |
| B | North-East |
| C | South-East |
| D | South-West |

Culture and Topography

197. Built-up areas

The aeronautical cartographic service provider shall—

- (a) select and show the cities, towns and villages on the Aeronautical Chart 1: 500,000 according to their relative importance to visual air navigation; and
- (b) indicate the cities and towns of sufficient size by the outline of their built-up areas and not of their established city limits.

198. Railroads

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart 1: 500,000 all railroads having landmark value and the important tunnels which serve as prominent landmarks.

199. Highways and roads

The aeronautical cartographic service provider shall—

- (a) show the road systems on the Aeronautical Chart 1:500,000 in sufficient detail to indicate significant patterns from the air; and
- (b) not show the roads in built-up areas unless they can be distinguished from the air as definite landmarks.

200. Landmarks

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart 1: 500,000, the natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees,

pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation.

201. Political boundaries

The aeronautical cartographic service provider shall show the international boundaries on the Aeronautical Chart 1: 500,000 and distinguish the un-demarcated and undefined boundaries by descriptive notes.

202. Hydrography

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Chart 1: 500,000 all water features compatible with the scale of the chart comprising shore lines, lakes, rivers and streams including those non-perennial in nature, salt lakes, glaciers and ice caps;
- (b) ensure that the tint covering large open water areas is kept very light; and
- (c) ensure that reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand gravel, stone and all similar areas, are shown by symbols when of significant landmark value.

203. Contours

The aeronautical cartographic service provider shall—

- (a) ensure that the contours are shown on the Aeronautical Chart 1: 500,000 and the selection of intervals is governed by the requirement to depict clearly the relief features required in air navigation; and
- (b) indicate the values of the contours used on the Chart.

204. Hypsometric tints

The aeronautical cartographic service provider shall, when hypsometric tints are used, show the range of elevations for the tints and indicate the scale of the hypsometric tints in the margin.

205. Spot elevations

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Chart 1: 500,000 the spot elevations at selected critical points and ensure that the elevations selected are the highest in the immediate vicinity and indicate the top of a peak and ridge;
- (b) indicate on the Aeronautical Chart 1: 500,000 the elevations in valleys and at lake surface level which are of navigational value and the show position of each selected elevation by a dot;
- (c) indicate the elevation of the highest point on the chart and its geographical position to the nearest five minutes in the margin; and
- (d) ensure that spot elevation of the highest point in any sheet is cleared of hypsometric tinting.

206. Incomplete or unreliable relief

The aeronautical cartographic service provider shall—

- (a) label the areas that have not been surveyed for contour information with the words “relief data incomplete”; or
- (b) state on the charts where spot elevations are generally unreliable a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, the words “warning-the reliability of relief information on this chart is doubtful and elevations should be used with caution”.

207. Escarpments

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart -1:500,000, the escarpments where the escarpments are prominent landmarks or where cultural detail is very sparse.

208. Wooded areas

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart -1:500,000, wooded areas, the approximate extreme northern or southern limits of tree growth by a dashed black line and appropriate labels.

209. Date of topographic information

The aeronautical cartographic service provider shall indicate in the margin of the Aeronautical Chart -1:500,000, the date of the latest information shown on the topographic base.

210. Magnetic variation

The aeronautical cartographic service provider shall indicate in the margin of the Aeronautical Chart -1:500,000, the isogonic lines and the date of the isogonic information.

*Aeronautical Data***211. General requirement**

The aeronautical cartographic service provider shall ensure that the aeronautical data shown on the Aeronautical Chart -1:500,000 are kept to a minimum consistent with the use of the chart for visual navigation and the revision cycle.

212. Aerodromes

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Chart -1:500,000 the land and water aerodromes and heliports with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance;
- (b) indicate the aerodrome elevation, the lighting available, the type of runway surface and the length of the longest runway or channel, in abbreviated form for each aerodrome in conformity with Schedule 1 to these Regulations, provided that they do not cause undesirable clutter on the chart; and

- (c) indicate and identify the abandoned aerodromes which are still recognised as aerodromes from the air as abandoned.

213. Obstacles

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart-1:500,000 the obstacles and the prominent transmission lines, permanent cable car installations and wind turbines, which are obstacles, when considered of importance to visual flight.

214. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart-1:500,000, the prohibited, restricted and danger areas.

215. Air traffic services system

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Chart-1:500,000 together with the appropriate class of airspace, the significant elements of the air traffic services system including, where practicable, control zones, aerodrome traffic zones, control areas, flight information regions and other airspaces in which VFR flights operate; and
- (b) indicate and identify the air defense identification zone, where appropriate.

216. Radio navigation aids

The aeronautical cartographic service provider shall indicate the radio navigation aids on the Aeronautical Chart-1:500,000 by the appropriate symbol and name but excluding their frequencies, coded designators, times of operation and other characteristics unless any or all the information shown is kept up to date by means of new editions of the chart.

217. Supplementary information

The aeronautical cartographic service provider shall indicate on the Aeronautical Chart-1:500,000—

- (a) the aeronautical ground lights together with their characteristics or identification or both;
- (b) the marine lights on outer prominent shoreline or isolated features of not less than 28km(15NM) visibility range where they are—
 - (i) not less distinguishable than more powerful marine lights in the vicinity;
 - (ii) readily distinguishable from other marine or other types of lights in the vicinity of built-up shoreline; and
 - (iii) the only lights of significance available.

PART XVIII—AERONAUTICAL NAVIGATION CHART—SMALL SCALE

218. Function of Aeronautical Navigation Chart-Small Scale

The aeronautical cartographic service provider shall ensure that the Aeronautical Navigation Chart – Small Scale —

- (a) serves as an air navigation aid for flight crews of long-range aircraft at high altitudes;
- (b) provides selective checkpoints over extensive ranges for identification at high altitudes and speeds, which are required for visual confirmation of position;
- (c) provides for continuous visual reference to the ground during long-range flights over areas lacking radio or other electronic navigation aids, or over areas where visual navigation is preferred or becomes necessary; and
- (d) provides a general-purpose chart series for long-range flight planning and plotting.

219. Availability of Aeronautical Navigation Chart-Small Scale

The aeronautical cartographic service provider shall make available the Aeronautical Navigation Chart- Small Scale in the manner specified in regulation 4(b) for all areas delineated in Schedule 5 to these Regulations.

220. Coverage and scale of Aeronautical Navigation Chart-Small Scale

The aeronautical cartographic service provider shall—

- (a) ensure that the Aeronautical Navigation Chart — Small Scale provides as a minimum, complete coverage of the major land masses of the world;
- (b) ensure that the scale is in the range of 1:2,000,000 to 1:5,000,000;
- (c) substitute the scale of the chart in the title for the words “Small Scale”;
- (d) arrange the linear scales for kilometres and nautical miles in the following order —
 - (i) kilometers;
 - (ii) nautical miles,with their zero points in the same vertical line shown in the margin;
- (e) ensure that the length of the linear scale is not less than 200 mm (8 in); and
- (f) indicate a conversion scale in metre or feet in the margin.

221. Format of Aeronautical Navigation Chart-Small Scale

The aeronautical cartographic service provider shall—

- (a) indicate the title and marginal notes on the Aeronautical Navigation Chart-Small Scale in English; and
- (b) ensure that the information regarding the number of the adjoining sheets and the unit of measurement expressing elevations is clearly visible when the sheet is folded.

222. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection;

- (b) indicate the name and basic parameters of the projection in the margin;
- (c) use the parallels at intervals of 1°;
- (d) indicate the graduations on the parallels at sufficiently close intervals compatible with the latitude and the scale of the chart;
- (e) indicate the meridians at intervals compatible with the latitude and the scale of the chart.
- (f) show the graduations on the meridians at intervals not exceeding 5' ;
- (g) ensure that the graduation marks extend away from the Greenwich Meridian and from the Equator;
- (h) indicate the numbers of all meridians and parallels in the borders of the chart; and
- (i) in addition, when required, indicate the numbers of meridians and parallels within the body of the chart in such a manner that they can be readily identified when the chart is folded.

Culture and Topography.

223. Built-up areas

The aeronautical cartographic service provider shall—

- (a) select and show the cities, towns, and villages on the Aeronautical Navigation Chart-Small Scale according to their relative importance to visual air navigation; and
- (b) indicate the cities and towns of sufficient size by the outline of their built-up areas and not of their established city limits.

224. Railroads

The aeronautical cartographic service provider shall indicate on the Aeronautical Navigation Chart-Small Scale, all railroads having landmark value and the important tunnels.

225. Colours

The aeronautical cartographic service provider shall—

- (a) use the subdued colours for the chart background to facilitate plotting; and
- (b) use good colour contrast to emphasize features important to visual air navigation.

226. Highways and roads

The aeronautical cartographic service provider shall—

- (a) show the road systems on the Aeronautical Navigation Chart-Small Scale in sufficient detail to indicate significant patterns from the air; and
- (b) not show the roads in built-up areas unless they can be distinguished from the air as definite landmarks.

227. Landmarks

The aeronautical cartographic service provider shall indicate on the Aeronautical Navigation Chart-Small Scale, the natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation.

228. Political boundaries

The aeronautical cartographic service provider shall show the international boundaries on the Aeronautical Navigation Chart-Small Scale and distinguish the un-demarcated and undefined boundaries by descriptive notes.

229. Hydrography

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Navigation Chart-Small Scale, all water features compatible with the scale of the

chart comprising shore lines, lakes, rivers and streams including those non-perennial in nature, salt lakes, glaciers and ice caps;

- (b) ensure that the tint covering large open water areas is kept very light; and
- (c) ensure that reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand gravel, stone and all similar areas, are shown by symbols when of significant landmark value.

230. Contours

The aeronautical cartographic service provider shall—

- (a) ensure that the contours are shown on the Aeronautical Navigation Chart-Small Scale and the selection of intervals is governed by the requirement to depict clearly the relief features required in air navigation; and
- (b) indicate the values of the contours used on the Chart.

231. Hypsometric tints

The aeronautical cartographic service provider shall, when hypsometric tints are used, show the range of elevations for the tints and indicate the scale of the hypsometric tints in the margin.

232. Spot elevations

The aeronautical cartographic service provider shall—

- (a) indicate on the Aeronautical Navigation Chart-Small Scale the spot elevations at selected critical points and ensure that the elevations selected are the highest in the immediate vicinity and indicate the top of a peak and ridge;
- (b) indicate on the Aeronautical Navigation Chart-Small Scale the elevations in valleys and at lake surface level which are of navigational value and the show position of each selected elevation by a dot;

- (c) indicate the elevation of the highest point on the chart and its geographical position to the nearest five minutes in the margin; and
- (d) ensure that spot elevation of the highest point in any sheet is cleared of hypsometric tinting.

233. Incomplete or unreliable relief

The aeronautical cartographic service provider shall—

- (a) label the areas that have not been surveyed for contour information with the words “relief data incomplete”; or
- (b) state on the charts where spot elevations are generally unreliable a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, the words “warning-the reliability of relief information on this chart is doubtful and elevations are used with caution”.

234. Escarpments

The aeronautical cartographic service provider shall indicate on the Aeronautical Navigation Chart-Small Scale, the escarpments where the escarpments are prominent landmarks or where cultural detail is very sparse.

235. Wooded areas

The aeronautical cartographic service provider shall indicate on the Aeronautical Navigation Chart-Small Scale, wooded areas, the approximate extreme northern or southern limits of tree growth by a dashed black line and approximate labels.

236. Date of topographic information

The aeronautical cartographic service provider shall indicate in the margin of the Aeronautical Navigation Chart-Small Scale, the date of the latest information shown on the topographic base.

237. Magnetic variation

The aeronautical cartographic service provider shall indicate in the margin of the Aeronautical Navigation Chart-Small Scale, the isogonic lines and the date of the isogonic information.

Aeronautical Data.

238. Aerodromes

The aeronautical cartographic service provider shall ensure that land and water aerodromes and heliports are shown on the Aeronautical Navigation Chart with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance.

239. Obstacles

The aeronautical cartographic service provider shall indicate all the obstacles on the Aeronautical Navigation Chart.

240. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall indicate on the Aeronautical Navigation Chart the prohibited, restricted and danger areas when considered to be of importance to air navigation.

241. Air traffic services system

The aeronautical cartographic service provider shall—

- (a) ensure that significant elements of the air traffic services system are shown on the Aeronautical Navigation Chart when considered to be of importance to air navigation; and
- (b) show and properly identify the air defense identification zone, where appropriate.

242. Radio navigation aids

The aeronautical cartographic service provider may indicate the radio navigation aids on the Aeronautical Navigation Chart-Small Scale by the appropriate symbol and name.

243. Function of electronic aeronautical chart display

The aeronautical cartographic service provider shall—

- (a) ensure that the Electronic Aeronautical Chart Display is prepared and made available in accordance with the requirements of the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (Aeroplanes) Regulations, 2022, the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 and the Civil Aviation (Operation of Aircraft) (Commercial Air Transport and General Aviation) (Helicopters) Regulations, 2022;
- (b) put in place adequate back-up arrangements; and
- (c) ensure that the Electronic Aeronautical Chart Display enables flight crews to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying the required information.

244. Information available for display

The aeronautical cartographic service provider shall ensure that the Electronic Aeronautical Chart Display is capable of displaying all aeronautical, cultural and topographic information required by Part V and Part VII through to Part XVIII.

Display Requirements

245. Display categories

The aeronautical cartographic service provider shall—

- (a) divide the information available for display into the following categories—
 - (i) basic display information, permanently retained on the display and consisting of the minimum information essential for the safe conduct of flight; and

- (ii) other display information, which may be removed from the display or displayed individually on demand, and consisting of information not considered essential for the safe conduct of flight;
- (b) ensure that adding or removing other display information is a simple function but not possible to remove information contained in the basic display.

246. Display mode and generation of neighbouring area

The aeronautical cartographic service provider shall ensure that—

- (a) the Electronic Aeronautical Chart Display is capable of continuously plotting the position of an aircraft in a true motion mode where reset and generation of the surrounding area takes place automatically; and
- (b) it is manually possible to change the chart area and the position of the aircraft relative to the edge of the display.

247. Scale of Electronic Aeronautical Chart Display

The aeronautical cartographic service provider shall ensure that it is possible to vary the scale at which a chart is displayed.

248. Symbols

The aeronautical cartographic service provider shall—

- (a) use the symbols specified for electronic charts in Schedule 1 to these Regulations except where it is desired to show items for which no chart symbol is provided in Schedule 1 to these Regulations;
- (b) in cases where no chart symbols are provided in Schedule 1 to these Regulations, choose electronic chart symbols which—
 - (i) employ a minimum use of lines, arcs and area fills;
 - (ii) do not cause confusion with any existing aeronautical chart symbol;

- (iii) do not impair the legibility of the display.

249. Display hardware

The aeronautical cartographic service provider shall—

- (a) ensure that the effective size of the chart presentation is sufficient to display the information required by regulation 244 without excessive scrolling;
- (b) ensure that the display has the capabilities required to accurately portray required elements of Schedule 1 to these Regulations;
- (c) use a method of presentation that ensures that the displayed information is clearly visible to the observer in the conditions of natural and artificial light experienced in the cockpit; and
- (d) ensure that the display luminance is adjustable by the flight crew.

250. Provision and updating of data

The aeronautical cartographic service provider shall—

- (a) provide and update the data for use by the display in accordance with the aeronautical data quality system requirements;
- (b) ensure that the display is capable of automatically accepting authorised updates to existing data and means of ensuring that authorised data and all relevant updates to that data have been correctly loaded into the display;
- (c) ensure that the display is capable of accepting updates to authorised data entered manually with simple means for verification prior to final acceptance of the data and updates entered manually are distinguishable on the display from authorised data and its authorised updates and shall not affect display legibility;

- (d) keep a record of all updates, including date and time of application; and
- (e) ensure that the display allows the flight crew to display updates and review the contents of the updates.

251. Performance tests, malfunction alarms and indication

The aeronautical cartographic service provider shall—

- (a) provide a means of carrying out on-board tests of major functions and in case of a failure, the test displays information to indicate which part of the system is at fault; and
- (b) provide a suitable alarm or indication of system malfunction.

252. Back-up arrangements

The aeronautical cartographic service provider shall provide backup arrangements to ensure safe navigation in case of a failure of the Electronic Aeronautical Chart Display, including—

- (a) facilities enabling a safe takeover of display functions to ensure that a failure does not result in a critical situation; and
- (b) a back-up arrangement facilitating the means for safe navigation of the remaining part of the flight.

PART XX—ATC SURVEILLANCE MINIMUM ALTITUDE CHART

253. Function of ATC Surveillance Minimum Altitude Chart

The aeronautical cartographic service provider shall ensure that —

- (a) the ATC Surveillance Minimum Altitude chart provides information to enable flight crews to monitor and cross-check altitudes assigned by a controller using an ATS surveillance system; and
- (b) a note indicating that the chart may only be used for cross-checking of altitudes assigned while the aircraft is identified is prominently displayed on the face of the chart.

254. Availability of ATC Surveillance Minimum Altitude Chart

The aeronautical cartographic service provider shall make available the ATC Surveillance Minimum Altitude Chart in the manner prescribed in regulation 4(2) where vectoring procedures are established and minimum vectoring altitudes cannot be shown adequately on the Area Chart, Standard Departure Chart-Instrument (SID) or Standard Arrival Chart-Instrument (STAR).

255. Coverage and scale of ATC Surveillance Minimum Altitude Chart

The aeronautical cartographic service provider shall ensure that —

- (a) the coverage of the chart under this Part is sufficient to effectively show the information associated with vectoring procedures;
- (b) the chart referred to under paragraph (a) is drawn to scale; and
- (c) the chart is drawn to the same scale as the associated Area Chart.

256. Projection

The aeronautical cartographic service provider shall—

- (a) use a conformal projection on which a straight line approximates a geodesic line on the ATC Surveillance Minimum Altitude Chart; and
- (b) place the graduation marks at consistent intervals along the neat lines, as appropriate.

257. Identification

The aeronautical cartographic service provider shall identify the chart under this Part by the name of the aerodrome for which the vectoring procedures are established or, when procedures apply to more than one aerodrome, the name associated with the airspace portrayed.

258. Culture and topography

The aeronautical cartographic service provider shall show—

- (a) the generalised shorelines of all open water areas, large lakes and rivers on a chart under this Part, except where they conflict with data more applicable to the function of the chart; and
- (b) the appropriate spot elevations and obstacles.

259. Magnetic variation

The aeronautical cartographic service provider shall indicate the average magnetic variation of the area covered by the chart under this Part to the nearest degree.

260. Bearings, tracks and radials

The aeronautical cartographic service provider shall—

- (a) ensure that the bearings, tracks and radials are magnetic; and
- (b) clearly indicate where bearings, tracks or radials are given with reference to True North or Grid North, and identify the reference grid meridian when Grid North is used.

Aeronautical Data

261. Aerodromes

The aeronautical cartographic service provider shall show on the chart under this Part—

- (a) all aerodromes that affect the terminal routings and where appropriate, use a runway pattern symbol; and
- (b) the elevation of the primary aerodrome to the nearest metre or foot.

262. Prohibited, restricted and danger areas

The aeronautical cartographic service provider shall ensure that the prohibited, restricted and danger areas are depicted with their identification on a chart under this Part.

263. Air traffic services system

(1) The aeronautical cartographic service provider shall indicate on the ATC Surveillance Minimum Altitude Chart the components of the established air traffic services system including—

- (a) the relevant radio navigation aids together with their identifications;
- (b) the lateral limits of relevant designated airspace;
- (c) the relevant significant points associated with standard instrument departure and arrival procedures;
- (d) the transition altitude, where established;
- (e) the information associated with vectoring including —
 - (i) minimum vectoring altitudes to the nearest higher 50m or 100ft, clearly identified;
 - (ii) lateral limits of minimum vectoring altitude sector normally defined by bearings and radials to or from radio navigation aids to the nearest degree or, if not practicable, geographical coordinates in degrees, minutes and seconds and shown by heavy lines to clearly differentiate between established sectors;
 - (iii) distance circles at 20-km or 10-NM intervals or, when practicable, 10-km or 5-NM intervals shown as fine dashed lines with the radius indicated on the circumference and centred on the identified aerodrome main VOR radio navigation aid or, if not available, on the aerodrome or heliport reference point;
 - (iv) notes concerning correction for low temperature effect, as applicable; and
 - (v) communications procedures including call signs and channels of the ATC units concerned.

(2) The aeronautical cartographic service provider shall provide a textual description of relevant communication failure procedures and whenever feasible, that description shall be shown on the chart or on the same page that contains the chart.

PART XXI—EXEMPTIONS

264. Application for exemption

(1) A person may apply to the Authority for an exemption from any of the provisions of these Regulations.

(2) The application referred to in subregulation (1) shall be made at least sixty days prior to the proposed effective date, stating the following—

- (a) name and contact address including electronic mail and fax, if any;
- (b) telephone number;
- (c) citation of the requirement from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of chart to be produced and published under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) an explanation of how the exemption would be in the public interest;
- (h) a detailed description of the alternative means by which the applicant will ensure a level of service or safety equivalent to that established by the provision in question;
- (i) a safety risk assessment carried out in respect of the exemption applied for; and
- (j) any other information that the Authority may require.

(3) Where the applicant seeks emergency processing of an application for exemption, the application shall contain supporting evidence and reasons for not filing the application within the time specified in subregulation (2) and reason for deeming the application an emergency.

(4) The Authority may, in writing, refuse an application made under subregulation (3), where the reasons given for emergency processing are not satisfactory.

265. Review and publication of application

(1) The Authority shall review the application for exemption for accuracy and compliance with these Regulations and if the application is satisfactory, the Authority shall publish a detailed summary of the application for comments, within thirty days of receipt of application, in either—

- (a) the Gazette; or
- (b) aeronautical information circular.

(2) Where the requirements for application have not been complied with, the Authority shall request the applicant in writing to comply prior to publication.

(3) If the request is for emergency relief, the Authority shall publish the decision after processing the application.

266. Evaluation of application

(1) Where the application requirements have been satisfied, the Authority shall conduct an evaluation of the request to include—

- (a) determination of whether an exemption would be in the public interest;
- (b) a determination, after a technical evaluation of whether the proposal of the applicant would provide a level of safety equivalent to that established by the regulation, although

where the Authority decides that a technical evaluation of the request would impose a significant burden on the Authority's technical resources, the Authority may deny the exemption on that basis;

- (c) a determination of whether a grant of the exemption would contravene these Regulations; and
- (d) a recommendation based on the preceding elements, of whether the request should be granted or denied and of any conditions or limitations that should be part of the exemption.

(2) The Authority shall notify the applicant in writing of the decision to grant or deny the request and publish a detailed summary of its evaluation and decision.

(3) The summary referred to in subregulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(4) If the exemption affects a significant population of the aviation community, the Authority shall publish the summary in the aeronautical information circular.

PART XXII—GENERAL

267. Use and retention of approvals and records

- (1) A person shall not—
 - (a) use any approval, permission, exemption or other document issued or required by or under these Regulations which has been forged, altered, revoked or suspended or to which the person is not entitled to use;
 - (b) forge or alter any approval, permission, exemption or other document issued or required under these Regulations;
 - (c) lend any approval, permission, exemption or other document issued or required under these Regulations to any other person; or

(d) make any false representation for the purpose of procuring for himself or any other person the issue, renewal or variation of an approval, permission or exemption or other document.

(2) A person shall not, during the period for which a record is required under these Regulations to be preserved—

(a) mutilate, alter, render illegible or destroy any records, or any entry made in the record;

(b) make, procure or assist in the making of any false entry in an approval or record; or

(c) omit to make a material entry in an approval or record.

(3) A record required to be maintained under these Regulations shall be recorded in a permanent and indelible material.

(4) A person shall not purport to issue an approval or exemption for the purpose of these Regulations unless that person is authorised to do so.

(5) The Authority may suspend or cancel an approval of an aeronautical cartographic service provider who contravenes any provision of these Regulations.

268. Deviation from regulations and procedures

Any deviation from a requirement or procedure under these Regulations shall be put in an endorsement on the Manual of Air Navigation Services Operations (MANSPOS) Part III-AIS/MAP.

269. Inspections and audits

The Authority shall—

(a) carry out inspections and audits as may be necessary for the purpose of verifying compliance with these Regulations.

- (b) carry out inspections and audits of any documents and records of aeronautical cartographic service provider, which may be necessary to determine compliance with the requirements of these Regulations.

270. Staff operational competence

The aeronautical cartographic service provider shall—

- (a) develop job description for all technical staff involved in cartographic services and aeronautical charts production;
- (b) develop training program for cartographic technical staff, which covers initial on-the-job, recurrent and advanced or specialised training;
- (c) develop annual training plan detailing and prioritizing what type of training will be provided and this training shall cover recurrent training;
- (d) prior to assigning tasks and responsibilities to new cartographic technical staff, ensure that they have satisfactorily completed initial and on-job-training in accordance with the training program; and
- (e) develop a system for the maintenance of training records for all air navigation services and cartographic technical staff.

PART XXIII—OFFENCES AND PENALTIES

271. Contravention of regulations

A person who contravenes any provision of these Regulations may have his or her licence, approval or exemption cancelled or suspended.

272. Offences and penalties

A person who contravenes any provision of these Regulations commits an offence and is liable, on conviction, to a fine not exceeding twenty four currency points or imprisonment not exceeding twelve months or

both and in the case of a continuing contravention, a fine not exceeding ten currency points for each day the offence continues.

PART XXIV—TRANSITIONAL PROVISION

273. Revocation S.I. No. 11 of 2020

(1) The Civil Aviation (Aeronautical Charts) Regulations, 2020 are revoked.

(2) Any approval or exemption issued under S.I No. 11, 2020 prior to the coming into force of these Regulations shall continue in force as if the approval or exemption were issued under these Regulations until the approval or exemption expires or are cancelled by the Authority.

(3) Notwithstanding the continuance of any authorisation, exemption or any other approval granted under subregulation (2), a person who at the commencement of these Regulations is carrying out any act, duty, or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer time as the Minister may by, notice in the Gazettee prescribe, comply with the requirements of these Regulations.

(4) Any person who fails to comply with subregulation (3), is liable to have a authorisation, exemption or any other approval cancelled in accordance with the provisions of these Regulations .

SCHEDULE 1

*Regulations 7(a) and (b), 17(1),
50(d), 185(b), 212(b), 247(a)
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| | | | | | | | | | |
|----------------------------|--|----|--|----|---------------------------------------|------------------|---------------------------------------|------------------------------|---------------|
| Contours | | 8 | Gravel | | | 12 | Highest elevation on chart | Alternative 17456 | .17456 |
| Approximate contours | | 9 | Levee or esker | | Alternative | 13 | Spot elevation | .6397 .8975 | |
| Relief shown by hachures | | 10 | Unusual land features appropriately labelled | | Many Great Volcanoes Basic Outcrop | 14 | Spot elevation (of doubtful accuracy) | .6370? | |
| Bluff, cliff or escarpment | | | | 15 | | Coniferous trees | | | |
| Lava flow | | | Active volcano | | | 16 | Other trees | | |
| Sand dunes | | 11 | Mountain pass | | | 17 | Palms | | |
| Sand area | | | | | | | | | |

18 Areas not surveyed for contour information or relief data incomplete

Caution

HYDROGRAPHY

| | | | | | | | | |
|------------------------------------|-----------------|----|---|------------------|--|----|---|-----------------|
| Shore line (reliable) | | 30 | Abandoned canal <i>Note.— Dry canal having landmark value.</i> | | | 38 | Reservoir | |
| Shore line (unreliable) | | 31 | Lakes (perennial) | | | 39 | Dry lake bed | Alternative |
| Tidal flats | | 32 | Lakes (non-perennial) | Alternative | | 40 | Wash | Alternative |
| Coral reefs and ledges | | 33 | Salt lake | | | 41 | Shoals | |
| Large river (perennial) | | 34 | Salt pans (evaporator) | | | 42 | Glaciers and ice caps | |
| Small river (perennial) | | 35 | Swamp | | | 43 | Danger line (2 m or one fathom line) | |
| Rivers and streams (non-perennial) | Alternative | 36 | Rice field | Alternative | | 44 | Charted isolated rock | |
| Rivers and streams (unsurveyed) | | 37 | Spring, well or water hole | perennial | | 45 | Rock awash | |
| Rapids | | | | intermittent | | 46 | Unusual water features appropriately labelled | |
| Falls | | | | | | | | |
| Canal | | | | | | | | |

CULTURE

BUILT-UP AREAS

| | | |
|----|--------------------|--|
| 47 | City or large town | |
| 48 | Town | |
| 49 | Village | |
| 50 | Buildings | |

HIGHWAYS AND ROADS

| | | |
|----|----------------|--|
| 57 | Dual highway | |
| 58 | Primary road | |
| 59 | Secondary road | |
| 60 | Trail | |
| 61 | Road bridge | |
| 62 | Road tunnel | |

MISCELLANEOUS (Cont.)

| | | |
|----|-----------------------|--|
| 69 | Pipeline | |
| 70 | Oil or gas field | |
| 71 | Tank farms | |
| 72 | Nuclear power station | |
| 73 | Coast guard station | |
| 74 | Lookout tower | |
| 75 | Mine | |
| 76 | Forest ranger station | |
| 77 | Race track or stadium | |
| 78 | Ruins | |
| 79 | Fort | |
| 80 | Church | |
| 81 | Mosque | |
| 82 | Pagoda | |
| 83 | Temple | |

RAILROADS

| | | |
|----|-------------------------------|--|
| 51 | Railroad (single track) | |
| 52 | Railroad (two or more tracks) | |
| 53 | Railroad (under construction) | |
| 54 | Railroad bridge | |
| 55 | Railroad tunnel | |
| 56 | Railroad station | |

MISCELLANEOUS

| | | |
|----|---|--|
| 63 | Boundaries (international) | |
| 64 | Outer boundaries | |
| 65 | Fence | |
| 66 | Telegraph or telephone line (when a landmark) | |
| 67 | Dam | |
| 68 | Ferry | |

AERODROMES

| | | | |
|----|----------|-------|--|
| 84 | Civil | Land | |
| 85 | Civil | Water | |
| 86 | Military | Land | |
| 87 | Military | Water | |

| | | | |
|----|---|-------|--|
| 88 | Joint civil and military | Land | |
| 89 | Joint civil and military | Water | |
| 90 | Emergency aerodrome or aerodrome with no facilities | | |
| 91 | Abandoned or closed aerodrome | | |

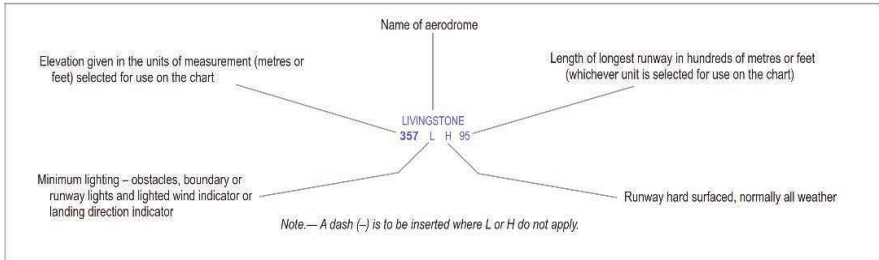
| | | |
|----|---|--|
| 92 | Sheltered anchorage | |
| 93 | Aerodrome for use on charts on which aerodrome classification is not required e.g. Enroute Charts | |
| 94 | Heliport Note.— Aerodrome for the exclusive use of helicopters | |

95


Note.— Where required by the function of the chart, the runway pattern of the aerodrome may be shown in lieu of the aerodrome symbol, for example:










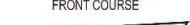







AERODROMES (Cont.)
AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE
IN ASSOCIATION WITH AERODROME SYMBOLS
 (Reference: 16.9.2.2 and 17.9.2.2)








AERODROME SYMBOLS FOR APPROACH CHARTS

| | | | |
|---|---|--|---|
| Aerodromes affecting the traffic pattern on the aerodrome on which the procedure is based |  | 98 The aerodrome on which the procedure is based |  |
|---|---|--|---|

RADIO NAVIGATION AIDS*

| | | | | | |
|---|--|--|---|---|---|
| Basic radio navigation aid symbol <i>Note.— This symbol may be used with or without a box to enclose the data.</i> |  | 107 Collocated VOR and TACAN radio navigation aids | VORTAC |  | |
| Non-directional radio beacon | NDB  | 108 Instrument landing system | ILS | PLAN VIEW |  |
| VHF omnidirectional radio range | VOR  | | | Electronic |  |
| Distance measuring equipment | DME  | | | FRONT COURSE |  |
| Collocated VOR and DME radio navigation aids | VOR/DME  | | | BACK COURSE |  |
| DME distance | Distance in kilometres (nautical miles) to DME → 15 km Identification of radio navigation aid → KAV | | | PROFILE |  |
| VOR radial | Radial bearing from, and identification of, VOR R 090 KAV | Electronic |  | | |
| UHF tactical air navigation aid | TACAN  | 109 Radio marker beacon | Elliptical |  | |
| | | | Bone Shape |  | |
| <i>Note.— Marker beacon may be shown by outline, or stipple, or both.</i> | | | | | |

| | | | |
|---|---|---|---|
| Compass rose To be orientated on the chart in accordance with the alignment of the station (normally Magnetic North) |  | Compass rose to be used as appropriate in combination with the following symbols: | VOR  |
| | | | VOR/DME  |
| | | | TACAN  |
| | | | VORTAC  |
| <i>Note.— Additional points of compass may be added as required.</i> | | | |

e.— Guidance material on the presentation of radio navigation aid data is given in the Aeronautical Chart Manual (Doc 8697).

AIR TRAFFIC SERVICES

| | | | | | |
|-----|--|------------|--|-------------|---|
| 111 | Flight information region | FIR | | | |
| 112 | Aerodrome traffic zone | ATZ | | | 117 Air defence identification zone ADIZ |
| 113 | Control area Airway Controlled route | CTA AWY | | Alternative | |
| | | | | | |
| 114 | Uncontrolled route | | | | 118 Advisory route ADR |
| 115 | Advisory airspace | ADA | | | 119 Visual flight path compulsory with radio communication requirement compulsory, without radio communication requirement recommended |
| 116 | Control zone | CTR | | | |
| | | | | Alternative | 120 Scale-break (on ATS route) |
| | | | | Alternative | |

| Significant Point Functionality | | | | | | | | |
|---------------------------------|----------------------------------|---|-----------------|---|-------------------|--------------------|--------------------|--|
| | | Significant point depiction for conventional navigation | | Significant point depiction for area navigation | | | | |
| REPORTING FLY-BY/FLY-OVER | | On request (NA) | Compulsory (NA) | On request fly-by | Compulsory fly-by | On request flyover | Compulsory flyover | |
| 121 | Basic Symbols with functionality | VFR reporting point | | | | | | |
| | | Intersection INT | | | | | | |
| | | VORTAC | | | | | | |
| | | TACAN | | | | | | |
| | | VOR | | | | | | |
| | | VOR/DME | | | | | | |
| | | NDB | | | | | | |
| | | Waypoint WPT | Not used | Not used | | | | |

For details on use and meaning of these symbols, refer to paragraph 2.4

| | | | | | | | | | | | |
|-----|--|-----|--|--|-----|-----------------------------|------------|--|-----|------------------------|--|
| 122 | Change-over point To be superimposed on the appropriate route symbol at right angles to the route | COP | | | 123 | ATS/MET reporting point MRP | Compulsory | | 124 | Final approach fix FAF | |
| | | | | | | | On request | | | | |

AIR TRAFFIC SERVICES (cont.)

| | | | | |
|-----|-----------------------------------|-------------------------------------|--------------------------------|--------------------------------|
| 125 | Procedure altitudes/flight levels | Altitude/flight level "window" | <u>17 000</u> <u>10 000</u> | <u>FL 220</u> <u>10 000</u> |
| | | "At or above" altitude/flight level | <u>7 000</u> | <u>FL 070</u> |
| | | "At or below" altitude/flight level | <u>5 000</u> | <u>FL 050</u> |
| | | "At" altitude/flight level | <u>3 000</u> | <u>FL 030</u> |
| | | "Recommended" altitude/flight level | 5 000 | FL 050 |
| | | "Expected" altitude/flight level | Expect 5 000 | Expect FL 050 |

AIRSPACE CLASSIFICATIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|--------------------------|-------------------|---|-------------------------|-----------------|-------|----------|------|--------------|--|------|-------------------|----------------------|-------------------------|-----------------|--|------------|--|----------|--------|--|--|--|--|--|----------|--|--|--|--|--|-------|--|
| 126 | Airspace classifications | | <p>Aeronautical data in abbreviated form to be used in association with airspace classification symbols:</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 10%;"></td> <td style="width: 15%;">TMA DONLON</td> <td style="width: 10%;">119.1</td> <td style="width: 10%; text-align: center;">C</td> <td style="width: 10%;">200m</td> <td style="width: 10%;">AGL - FL 245</td> </tr> <tr> <td></td> <td>Type</td> <td>Name or call sign</td> <td>Radio frequency(ies)</td> <td>Airspace classification</td> <td>Vertical limits</td> </tr> </table> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 10%;"></td> <td style="width: 15%;">TMA DONLON</td> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">C</td> <td style="width: 10%;">FL 245</td> <td style="width: 10%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>200m AGL</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>119.1</td> <td></td> </tr> </table> | | TMA DONLON | 119.1 | C | 200m | AGL - FL 245 | | Type | Name or call sign | Radio frequency(ies) | Airspace classification | Vertical limits | | TMA DONLON | | C | FL 245 | | | | | | 200m AGL | | | | | | 119.1 | |
| | TMA DONLON | 119.1 | C | 200m | AGL - FL 245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Type | Name or call sign | Radio frequency(ies) | Airspace classification | Vertical limits | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TMA DONLON | | C | FL 245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 200m AGL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 119.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 127 | Alternative | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

AIRSPACE RESTRICTIONS

| | | | | |
|-----|---|--|------------------------------|--|
| 128 | Restricted airspace (prohibited, restricted or danger area) | | Common boundary of two areas | |
| | <i>Note. — The angle and density of rulings may be varied according to scale and the size, shape and orientation of the area.</i> | | | |
| 129 | International boundary closed to passage of aircraft except through air corridor | | | |

OBSTACLES

| | | | | | |
|-----|-------------------------|--|--|---|---|
| 130 | Obstacle | | 134 | Exceptionally high obstacle (optional symbol) | |
| 131 | Lighted obstacle | | 135 | Exceptionally high obstacle – lighted (optional symbol) | |
| 132 | Group obstacles | | <i>Note. — For obstacles having a height of the order of 300 m (1 000 ft) above terrain.</i> | | |
| 133 | Lighted group obstacles | | 136 | | <p>Elevation of top (italics)</p> <p>Height above specified datum (upright type in parentheses)</p> |

MISCELLANEOUS

| | | | | | | |
|----|--|--|-----|--|--|--|
| 37 | Prominent transmission line | | 140 | Wind turbine – unlighted and lighted | | |
| 38 | Isogonic line or isogonal | | 141 | Wind turbines – minor group and group in major area, lighted | | |
| 39 | Ocean station vessel (normal position) | | | | | |

VISUAL AIDS

| | | | | | | | | | | | |
|-----|--|---|-----|------------------------------|--------|-----|-----------|---|--|--|--|
| 42 | Marine light <i>Note 2— Characteristics are to be indicated as follows:</i> | <table border="0"> <tr> <td>Alt</td> <td rowspan="3">Alternating Blue Fixed</td> <td rowspan="3"></td> </tr> <tr> <td>B</td> </tr> <tr> <td>F</td> </tr> </table> | Alt | Alternating Blue Fixed | | B | F | <i>Note 1— Marine alternating lights are red and white unless otherwise indicated. Marine lights are white unless colours are stated.</i> | | | |
| Alt | Alternating Blue Fixed | | | | | | | | | | |
| B | | | | | | | | | | | |
| F | | | | | | | | | | | |
| | | | Fl | Oce | Oc | sec | Second | | | | |
| | | | G | R | R | (U) | Unwatched | | | | |
| | | | Gr | SEC | Sector | W | White | | | | |
| 43 | Aeronautical ground light | | 44 | Lightship | | | | | | | |

SYMBOLS FOR AERODROME/HELIPORT CHARTS

| | | | | | | | | | |
|-----------|--|-----|---|---|---|-----------|--|-----------|--|
| 45 | Hard surface runway | | 154 | Point light | | | | | |
| 46 | Pierced steel plank or steel mesh runway | | | | | | | | |
| 47 | Unpaved runway | | 155 | Obstacle light | | | | | |
| 48 | Stopway | SWY | 156 | Landing direction indicator (lighted) | | | | | |
| 49 | Taxiways and parking areas | | 157 | Landing direction indicator (unlighted) | | | | | |
| 50 | Helicopter alighting area on an aerodrome | | 158 | Stop bar | | | | | |
| 51 | Aerodrome reference point | ARP | 159 | Runway-holding position | <table border="0"> <tr> <td>Pattern A</td> <td></td> </tr> <tr> <td>Pattern B</td> <td></td> </tr> </table> | Pattern A | | Pattern B | |
| Pattern A | | | | | | | | | |
| Pattern B | | | | | | | | | |
| 52 | VOR check-point | | <i>Note— For application, see Annex 14, Volume I, 5.2.10.</i> | | | | | | |
| 53 | Runway visual range (RVR) observation site | | 160 | Intermediate holding position | | | | | |
| | | | <i>Note— For application, see Annex 14, Volume I, 5.2.11.</i> | | | | | | |
| | | | 161 | Hot spot | | | | | |
| | | | <i>Note— Hot spot location to be circled.</i> | | | | | | |

SYMBOLS FOR AERODROME OBSTACLE CHARTS - TYPE A, B AND C

| | Plan | Profile | | Plan | Profile | |
|----|-------------------------------------|---------|-----------------------|------|------------------------------------|-----|
| 62 | Tree or shrub | | Identification number | 167 | Terrain penetrating obstacle plane | |
| 63 | Pole, tower, spire, antenna, etc. | | | 168 | Escarpment | |
| 64 | Building or large structure | | | 169 | Stopway | SWY |
| 65 | Railroad | | | 170 | Cleanway | CWY |
| 66 | Transmission line or overhead cable | | | | | |

ADDITIONAL SYMBOLS FOR USE ON PAPER AND ELECTRONIC CHARTS

| PLAN VIEW | | Electronic |
|-----------|---|------------|
| 171 | <p>Minimum sector altitude</p> <p>Note.— This symbol may be modified to reflect particular sector shapes.</p> | |
| 172 | <p>Terminal arrival altitude</p> <p>Note.— This symbol may be modified to reflect particular TAA shapes.</p> | |
| 173 | Holding pattern | |
| 174 | Missed approach track | |

| PROFILE | | |
|---------|---|--|
| 175 | Runway | |
| 176 | Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol) | |
| 177 | Radio marker beacon (type of beacon to be annotated on top of the symbol) | |
| 178 | Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol) | |
| 179 | DME fix (distance from DME and the fix use in the procedure to be annotated on top of the symbol) | |
| 180 | Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol) | |

SCHEDULE 2

Regulation 14

COLOUR GUIDE









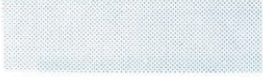



| CHART SYMBOLS | | | |
|--|---------------------|---|---|
| uture, except highways and roads; outlines of large cities, grids and graticules; spot elevations; danger lines and off-shore rocks; names and lettering except for aeronautical and hydrographic features | BLACK |  | |
| lit-up areas of cities | BLACK Stipple |  | |
| hways and roads | Optional colours | BLACK Half-tone |  |
| | | RED |  |
| lit-up areas for cities (alternative to black stipple) | YELLOW |  | |
| colours and topographic features: Items 1 through 10 of Appendix 2 hydrographic features: Items 39 through 41 of Appendix 2 | BROWN |  | |
| re lines, drainage, rivers, lakes, bathymetric contours and other hydrographic features ncluding their names or description | BLUE |  | |
| in water areas | BLUE Half-tone |  | |
| t lakes and salt pans | BLUE Stipple |  | |
| ge non-perennial rivers and non-perennial lakes | BLUE Stipple |  | |
| onautical data, except for Enroute and Area Charts — ICAO, where different colours may be required. Both contours may be used on the same sheet ut, where only one colour is used, dark blue is preferred. | Optional colours | MAGENTA |  |
| | | DARK BLUE |  |

CHART SYMBOLS (Cont.)

Woods

GREEN



Areas which have not been surveyed for contour information or relief data are incomplete

Optional colours

GOLDEN BUFF



WHITE

HYSOMETRIC TINTS

WHITE

Tint for extreme elevations

VIOLET

ORANGE or BUFF

Tint for higher range elevations

YELLOW

Tint for middle range elevations

GREEN

Tint for lower range elevations

BLUE-GREEN

Tint for areas below sea level

SEPIA

BROWN

BUFF

GREEN

Optional colours

WHITE

BLUE-GREEN

Optional colours

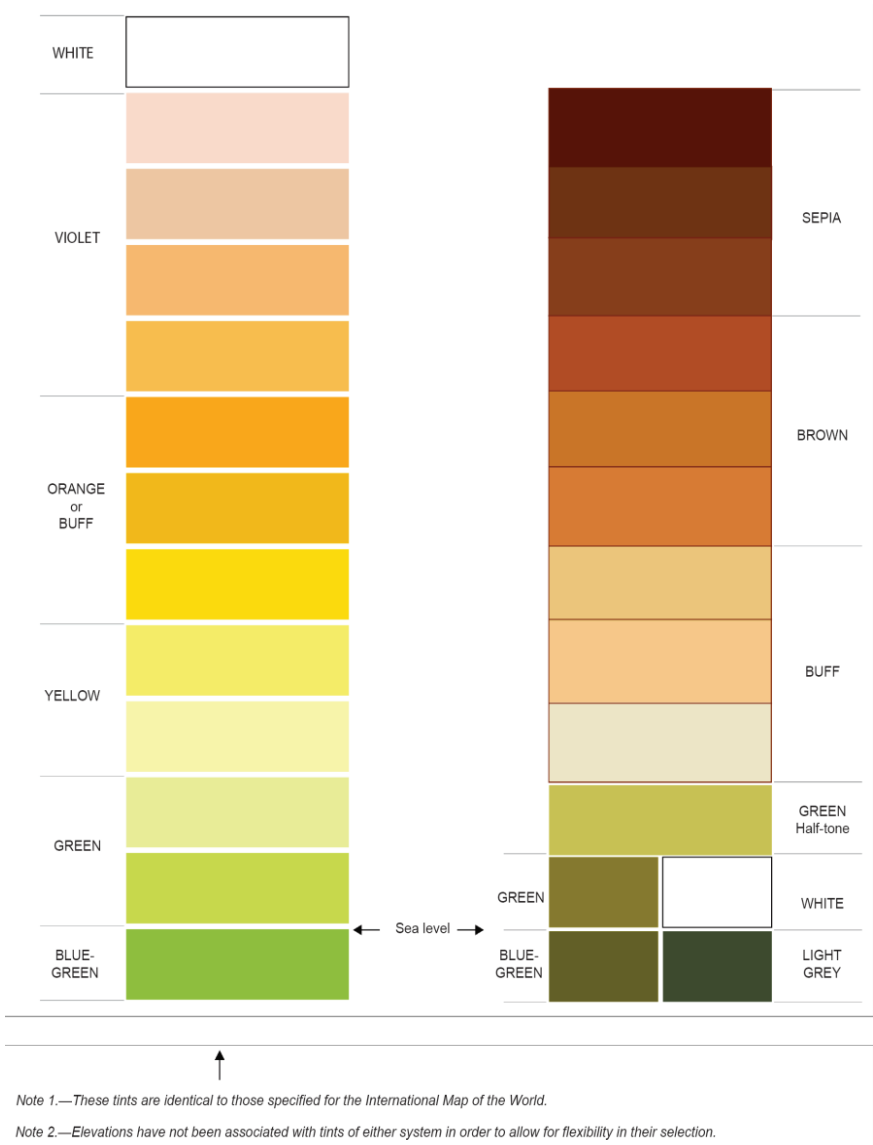
LIGHT GREY

Note - Basic tints are identical to those specified in the International Map of the World

SCHEDULE 3

Regulation 15(b)

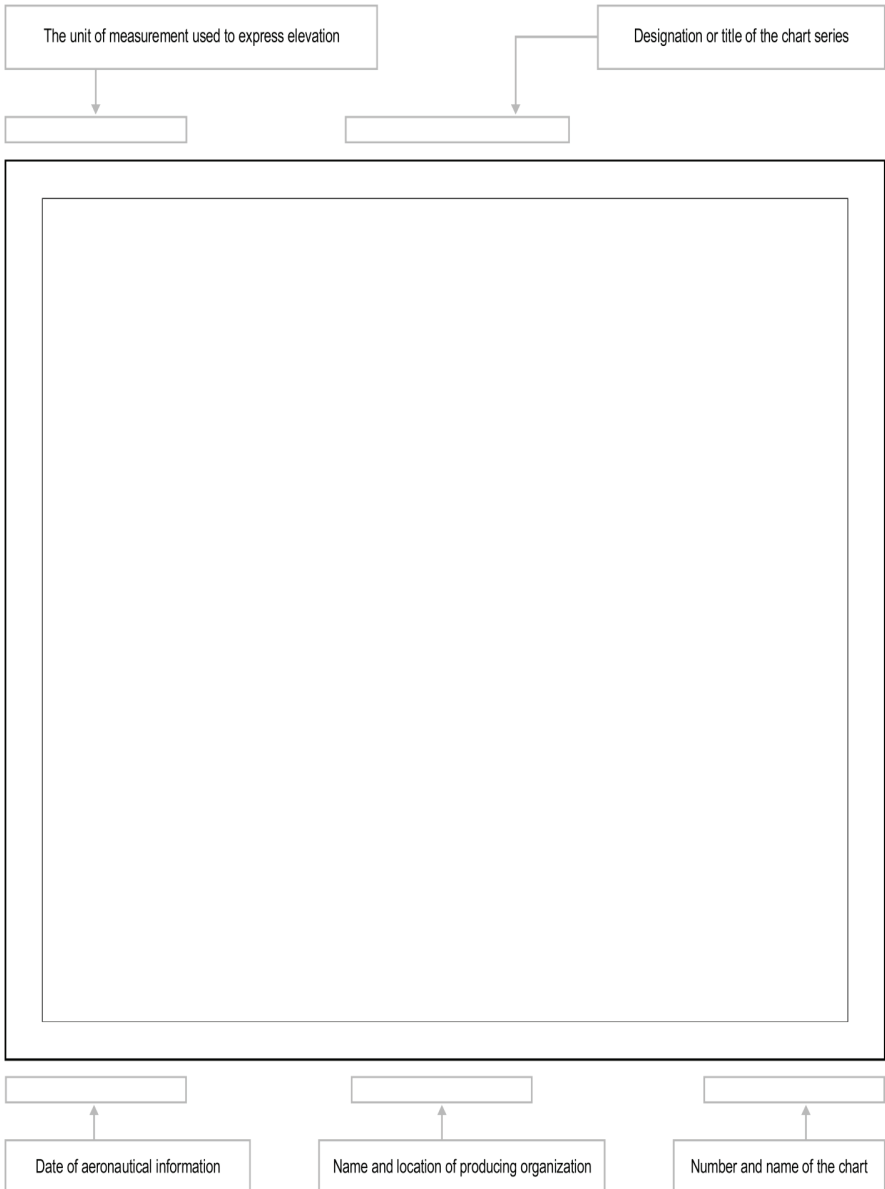
HYPOSOMETRIC TINT GUIDE



SCHEDULE 4

Regulation 23(a)

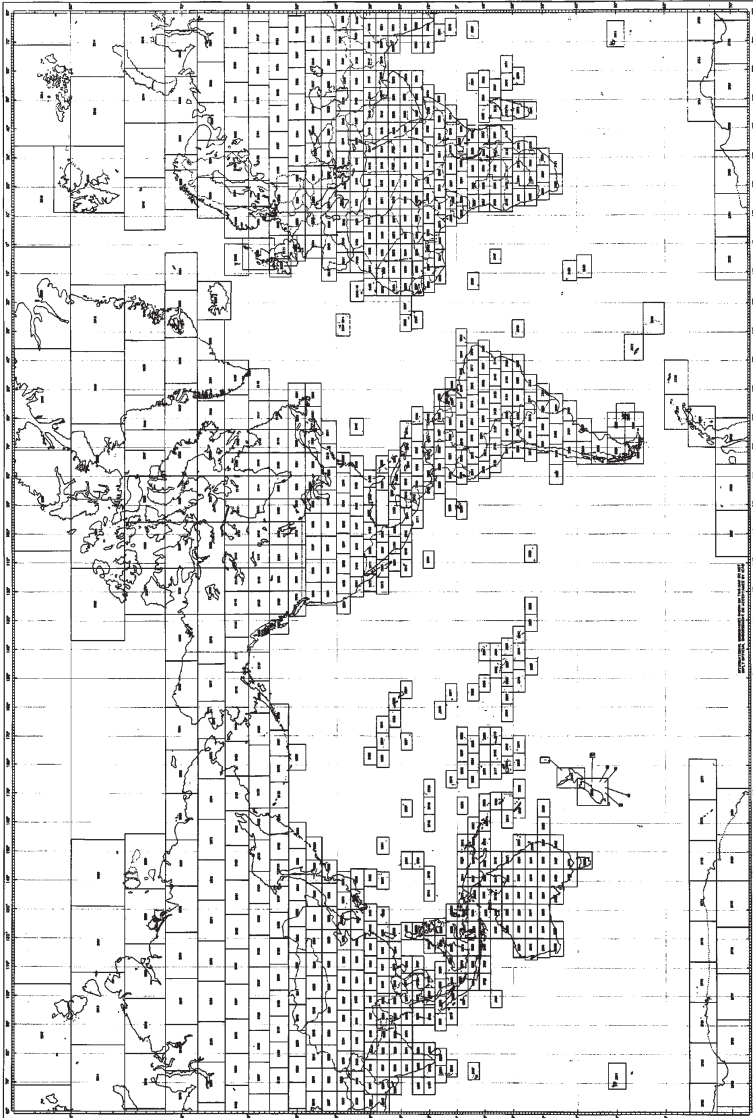
MARGINAL LAYOUT



SCHEDULE 5

*Regulations 165,167(d),
169, 192 and 219*

SHEET LAYOUT FOR THE WORLD AERONAUTICAL CHART ICAO 1:1,000,000



Cross References

Civil Aviation (Aerodrome) Regulations, 2022 S.I. No. 94 of 2022

Civil Aviation (Aeronautical Information Services) Regulations, 2022 S.I. No. 71 of 2022

Civil Aviation (Air Traffic Services) Regulations, 2022 S.I. No. 74 of 2022

Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022 S.I. No. 84 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 S.I. No. 85 of 2022

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022, S.I. No. 86 of 2022

GEN. EDWARD KATUMBA-WAMALA (MP)
Minister of Works and Transport.

STATUTORY INSTRUMENTS SUPPLEMENT

to The Uganda Gazette No. 50, Volume CXV, dated 12th August, 2022

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 69

**THE CIVIL AVIATION (AERONAUTICAL COMMUNICATION
PROCEDURES) REGULATIONS, 2022**

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STATUTORY INSTRUMENTS

2022 No. 69

The Civil Aviation (Aeronautical Communications Procedures) Regulations, 2022

(Under sections 34 and 61 of the Civil Aviation Authority Act, Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by sections 34 and 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 11th day of July, 2022.

PART I— PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aeronautical Communications Procedures) Regulations, 2022.

2. Application

These Regulations apply to persons providing communication, navigation or surveillance services within designated air spaces and at aerodromes.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“aeronautical broadcasting service” means a broadcasting service intended for the transmission of information relating to air navigation;

“aeronautical fixed service (AFS)” means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services;

“aeronautical fixed station” means a station in the Aeronautical Fixed Service;

“Aeronautical Fixed Telecommunication Network (AFTN)” means a worldwide system provided as part of the AFS for the exchange of messages or digital data between aeronautical fixed stations having the same or compatible communications characteristics;

“AFTN circuit” means a circuit forming part of the AFTN;

“aeronautical mobile (R)* service” means an aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes;

“aeronautical mobile service” means a mobile service between aeronautical stations and aircraft stations or between aircraft stations, in which survival craft stations may participate;

“aeronautical mobile-satellite (R)* service” means an aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes;

“aeronautical mobile-satellite service” means a mobile satellite service in which mobile earth stations are located on board aircraft;

“aeronautical radio navigation service” means a radio navigation service intended for the benefit and for the safe operation of aircraft;

“aeronautical station” means a land station in the aeronautical mobile service;

“aeronautical telecommunication agency” means an agency responsible for operating a station in the aeronautical

telecommunication service;

“aeronautical telecommunication log” means a record of the activities of an aeronautical telecommunication station;

“aeronautical telecommunication service” means a telecommunication service provided for any aeronautical purpose;

“aeronautical telecommunication station” means a station in the aeronautical telecommunication service;

“AFTN destination station” means an AFTN station to which messages or digital data are addressed for processing for delivery to the addressee;

“AFTN origin station” means an AFTN station where messages or digital data are accepted for transmission over the AFTN;

“AFTN station” means a station forming part of the AFTN and operating as such under the authority or control of a State;

“aircraft operating agency” means the person, organisation or enterprise engaged in, or offering to engage in an aircraft operation;

“aircraft station” means a mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft;

“air-ground communication” means a two-way communication between aircraft and stations or locations on the surface of the earth;

“air-ground control radio station” means an aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of an aircraft in a given area;

air navigation services” means services provided to air traffic during all phases of operations including air traffic management, communications, navigation and surveillance, search and rescue, aeronautical information services and construction of instrument flight procedures;

“Air Navigation Services Provider (ANSP)” means a directorate in the authority designated for the purposes of operating and managing air navigation services;

“air-report” means a report from an aircraft in flight prepared in conformity with requirements for position and operational or meteorological reporting;

“altitude” means the vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL);

“ATS direct speech circuit” means an (AFS) telephone circuit, for direct exchange of information between air traffic services (ATS) units;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;

“automatic relay installation” means a teletypewriter installation where automatic equipment is used to transfer messages from incoming to outgoing circuits;

“broadcast” means a transmission of information relating to air navigation that is not addressed to a specific station or stations;

“communication centre” means an aeronautical fixed station which relays or retransmits telecommunication traffic from a number of other aeronautical fixed stations directly connected to it;

“current data authority” means the designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place;

“downstream data authority” means a designated ground system, different from the current data authority, through which the pilot can contact an appropriate ATC unit for the purposes of receiving a downstream clearance;

“flight level” means a surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other surfaces by specific pressure intervals;

“free text message element” means a message element used to convey information not conforming to any standardised message element in the CPDLC message set;

“fully automatic relay installation” means a teletypewriter installation where interpretation of the relaying responsibility in respect of an incoming message and the resultant setting up of the connections required to effect the appropriate retransmissions is carried out automatically, as well as all other normal operations of relay, thus obviating the need for operator intervention, except for supervisory purposes;

“ground-to-air communication” means a one-way communication from stations or locations on the surface of the earth to aircraft;

“human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;

“IATS” means the International Aeronautical Telecommunications Service;

“ICAO” means the International Civil Aviation Organisation;

“international telecommunication service” means a telecommunication service between offices or stations of different States, or between mobile stations which are not in the same State, or are subject to different States;

“interpilot air-to-air communication” means a two-way communication on the designated air-to-air channel to enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and to facilitate the resolution of operational problems;

“location indicator” means a four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station;

“message field” means an assigned area of a message containing specified elements of data;

“meteorological operational channel” means a channel of the AFS, for the exchange of aeronautical meteorological information;

“meteorological operational telecommunication network” means an integrated system of meteorological operational channels, as part of the AFS, for the exchange of aeronautical meteorological information between the aeronautical fixed stations within the network;

- “Minister” means the Minister responsible for aviation;
- “mobile surface station” means a station in the aeronautical telecommunication service, other than an aircraft station, intended to be used while in motion or during halts at unspecified points;
- “network station” means an aeronautical station forming part of a radiotelephony network;
- “next data authority” means the ground system so designated by the current data authority through which an onward transfer of communications and control can take place;
- “non-network communications” means radiotelephony communications conducted by a station of the aeronautical mobile service, other than those conducted as part of a radiotelephony network;
- “NOTAM” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations;
- “operational control communications” means communications required for the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of a flight;
- “pre-formatted free text message element” means a free text message element that is stored within the aircraft system or ground system for selection;

- “primary frequency” means the radiotelephony frequency assigned to an aircraft as a first choice for air-ground communication in a radiotelephony network;
- “radio direction finding (RR S1.12)” means radio determination using the reception of radio waves for the purpose of determining the direction of a station or object;
- “radio direction-finding station (RR S1.91)” means a radio determination station using radio direction finding;
- “radiotelephony network” means a group of radiotelephony aeronautical stations which operate on and guard frequencies from the same family and which support each other in a defined manner to ensure maximum dependability of air-ground communications and dissemination of air-ground traffic;
- “read back” means a procedure whereby the receiving station repeats a received message or an appropriate part of the message back to the transmitting station so as to obtain confirmation of correct reception;
- “regular station” means a station selected from stations forming an enroute air-ground radiotelephony network to communicate with or to intercept communications from aircraft in normal conditions;
- “route segment” means a route or portion of route usually flown without an intermediate stop;
- “routing directory” means a list in a communication centre indicating for each addressee the outgoing circuit to be used;
- “secondary frequency” means the radiotelephony frequency assigned to an aircraft as a second choice for air-ground communication in a radiotelephony network;

- “semi-automatic relay installation” means a teletypewriter installation where interpretation of the relaying responsibility in respect of an incoming message and the resultant setting up of the connections required to effect the appropriate retransmissions require the intervention of an operator but where all other normal operations of relay are carried out automatically;
- “simplex” means a method in which telecommunication between two stations takes place in one direction at a time;
- “SNOWTAM” means a special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format;
- “telecommunication” means any transmission, emission, or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems;
- “teletypewriter tape” means a tape on which signals are recorded in the 5-unit Start-Stop code by completely severed perforations (Chad Type) or by partially severed perforations (Chad less Type) for transmission over teletypewriter circuits;
- “torn-tape relay installation” means a teletypewriter installation where messages are received and relayed in teletypewriter tape form and where all operations of relay are performed as the result of operator intervention;
- “tribunal” means the Appeals Tribunal established under section 43 of the Act; and
- “tributary station” means an aeronautical fixed station that may route, receive or transmit messages or digital data but which does not relay except for the purpose of serving

similar stations connected through it to a communication centre.

PART II—GENERAL REQUIREMENTS

4. Requirements for communication, navigation and surveillance facilities

The installation, commissioning, operation and maintenance of the communication, navigation or surveillance facilities shall conform to these Regulations.

5. Certification

A person shall not provide communication, navigation or surveillance services or operate a facility to support air traffic services without an air navigation services provider certificate issued in accordance with the Civil Aviation (Certification of Air Navigation Services) Regulations, 2022.

6. Application for approval

A person who wishes to provide communication, navigation and surveillance systems or to operate communication, navigation or surveillance facility in the designated airspace and aerodromes shall apply to the authority for approval.

7. Sitting and installation

(1) The air navigation services provider shall determine the site for installation of a facility based on operational requirements, construction aspects and maintainability.

(2) The facility referred to in subregulation (1) shall be installed by personnel who are qualified in air navigation facilities and who have knowledge of the operations, testing and maintenance of the communication, navigation and surveillance facilities.

8. Installation, operation and maintenance of communication, navigation or surveillance systems

The air navigation service provider shall establish procedures to ensure that communication, navigation and surveillance systems—

- (a) are operated, maintained, available and reliable in accordance with the requirements prescribed by the authority;
- (b) are designed to meet the applicable operational specification for that facility;
- (c) are installed and commissioned as prescribed by the authority; and
- (d) conform to the applicable system characteristics and specifications.

9. Commissioning of facilities

(1) The authority shall be involved in the commissioning of communication, navigation or surveillance facilities to confirm that the facilities meet the standard operating parameters and these Regulations before commencement of operations.

(2) The air navigation services provider shall establish procedures to ensure that each new facility is commissioned to meet the specifications for that facility and is in compliance with these Regulations.

(3) The air navigation services provider shall at the time of commissioning a facility referred to in subregulation (1), validate the system performance of every new facility by carrying out the necessary tests.

(4) The procedures referred to in subregulation (2) shall include documentation of tests conducted on the facility prior to commissioning, including the tests for the compliance of the facility with the applicable standards and any flight checks required by these Regulations.

10. Inspections and audits

(1) The authority shall carry out safety inspections and audits on communication, navigation and surveillance facilities, documents and records of the communication, navigation or surveillance facilities to determine compliance with these Regulations.

(2) An inspector designated by the authority shall have unrestricted access to the communication, navigation and surveillance facilities, records and documents of the facilities approved under these Regulations to determine compliance with these Regulations.

11. Availability and reliability

The air navigation services provider shall provide protected power supply system, battery back-up, reliable connectivity and air conditioning.

12. Test equipment

(1) The ANSP shall provide appropriate tools and test equipment to personnel to maintain the operation of equipment.

(2) The ANSP shall establish a procedure to control, calibrate and maintain the equipment.

(3) The maintenance plan and the operating and maintenance instructions for each facility shall specify the test equipment requirements for all levels of operation and maintenance undertaken.

(4) The ANSP shall use documented procedures established under subregulation (2) to control, calibrate and maintain test equipment.

13. Record keeping

The ANSP shall establish procedures to identify, collect, index, store, maintain and dispose of records relating to—

- (a) the performance and maintenance history of the facility;
- (b) the establishment of the periodic test programmes for the facility;
- (c) test equipment required for the measurement of critical performance parameters;
- (d) reported or detected facility malfunction;
- (e) internal quality assurance review; and

- (f) the person authorised to place facilities into operational service.

14. Documentation

The ANSP shall—

- (a) keep copies of relevant equipment manuals, technical standards, practices, instructions, maintenance procedures, site logbooks and any other documentation that are necessary for the provision and operation of the facility;
- (b) record all occurrences and actions relating to operation, maintenance, modification, failure, faults, removal from and restoration to service in the logbooks; and
- (c) establish a procedure for the control of the documentation required under this regulation.

15. Periodic inspection and testing

(1) The ANSP shall establish a procedure for the periodic inspection and testing of the communication, navigation and surveillance systems to verify that the facility meets the applicable operational requirements and performance specifications for each facility.

- (2) The periodic inspection shall include—
 - (a) security of the facility and site;
 - (b) adherence to the approved maintenance programme;
 - (c) upkeep of the equipment, building, site and site services; and
 - (d) adequacy of facility records and documentation.

16. Flight inspection

The ANSP shall ensure that the radio navigation aids prescribed under these Regulations are available for use by all aircraft engaged in air navigation and are subjected to periodic ground and flight inspection.

17. Operation and maintenance plan

(1) The ANSP shall establish an operation and maintenance plan for the communication, navigation and surveillance facilities, to meet the safety requirements prescribed under these Regulations.

(2) The operation and maintenance plan established under subregulation (1) shall provide for the timely and appropriate detection and warning of system failures and degradations.

18. Training requirements for communication, navigation and surveillance personnel

(1) The ANSP shall ensure that all its personnel possess the skills and competencies required in the provision of the communication navigation and surveillance services.

(2) The ANSP shall—

- (a) develop a training policy and programme for the organisation;
- (b) maintain training records and a training plan for the staff; and
- (c) conduct periodic reviews of the training plan.

19. Communication, navigation and surveillance personnel requirements

(1) The ANSP shall employ a sufficient number of competent personnel to perform the installation, operation and maintenance of communication, navigation and surveillance systems in the designated airspaces and aerodromes.

(2) The ANSP shall provide in the Manual of Air Navigation Service Operations an analysis of the personnel required to perform the communication, navigation and surveillance services for each facility, taking into account the duties and workload required.

(3) A person shall not perform a function related to installation, operation or maintenance of a communication, navigation and a surveillance system unless—

- (a) that person has successfully completed training in the performance of that function;
- (b) the air navigation services provider is satisfied that the technical person is competent in performing that function; and
- (c) that person has been certified in accordance with these Regulations.

20. Proficiency certification program

The authority shall develop a proficiency certification program of personnel who are engaged in the installation, operation and maintenance of communication, navigation and surveillance systems used in designated airspace and aerodrome.

PART III— ADMINISTRATIVE PROVISIONS RELATING TO INTERNATIONAL
AERONAUTICAL TELECOMMUNICATION SERVICE

21. Division of service

IATS shall be divided into the following four parts —

- (a) aeronautical fixed services;
- (b) aeronautical mobile services;
- (c) aeronautical radio navigation services; and
- (d) aeronautical broadcasting services.

22. Telecommunication access

The authority shall ensure that aeronautical telecommunication stations, including end systems and intermediate systems of the aeronautical telecommunication network, are protected from unauthorised direct or remote access.

23. Hours of service

(1) The authority shall give notice of the normal hours of service of stations and offices of the IATS under its control to the aeronautical telecommunications agencies designated to receive this information of other administrations concerned.

(2) The authority shall give notice of any change in the normal hours of service to the aeronautical telecommunication agencies designated to receive the information of other administrations concerned, before the change is effected.

(3) The changes referred to in subregulation (2) shall be notified in a NOTAM.

(4) Where a station of the IATS or an aircraft operating agency, requires a change in the hours of service of another station, the change shall be requested as soon as possible after the need for change is known by the station.

(5) The station or aircraft operating agency that requests for a change under subregulation (4) shall be informed of the decision on the request as soon as possible.

24. Supervision

(1) The Minister shall designate an authority responsible for ensuring that the IATS is conducted in accordance with these Regulations.

(2) Any occasional infringement of the procedures prescribed by these Regulations shall be dealt with by direct communication, immediately, between the parties concerned either by correspondence or by personal contact, where the infringement is not of a serious nature.

(3) Where the authority determines that a serious and repeated infringement has occurred at a station, the person in charge of the station shall make available to the authority only representations relating to the infringements.

(4) The authority designated under subregulation (1) shall exchange information relating the performance of systems of communication, radio navigation, operation and maintenance or unusual transmission phenomena.

25. Superfluous transmissions

The authority shall ensure that there is no willful transmission of unnecessary or anonymous signals, messages or data by any station in Uganda.

26. Interference

An ANSP shall ensure that all precautions, such as the choice of frequency and of time and the reduction or if possible, the suppression of radiation, are taken to avoid harmful interference during tests and experiments in any station and that any resulting interference is eliminated as soon as possible.

PART IV— GENERAL PROCEDURES FOR INTERNATIONAL AERONAUTICAL TELECOMMUNICATION SERVICE

27. Extensions of services and closing down of stations

(1) Where required by the authority, a station of the IATS shall extend its normal hours of service to provide for traffic necessary for flight operations.

(2) A station shall notify its intention to all other stations with which it is in direct communication to confirm that an extension of service is not required and advise of the time of re-opening, if not within its normal hours of service before close down.

(3) A station shall notify its intention of closing down either to the control station, if any or to all stations in the network where it is working regularly in a network on a common circuit.

(4) The station referred to in subregulation (3) shall continue to watch for two minutes and may close down, if the station has received no call during this period.

(5) The stations with other than continuous hours of operation, engaged in or expected to become engaged in distress, urgency, unlawful interference or interception traffic, shall extend their normal hours of service to provide the required support to those communications.

28. Acceptance of messages

(1) An ANSP shall accept for transmission only messages coming within the categories specified in regulation 39.

(2) Determining the acceptability of a message shall be the responsibility of the station where the message is filed for transmission.

(3) The ANSP of any station through which a message is relayed shall make representations at a later date to the ANSP in control of the accepting station regarding any message which is considered unacceptable.

(4) Only messages for stations forming part of the Aeronautical Telecommunication Service shall be accepted for transmission, except where special arrangements have been made with the air navigation service provider concerned.

(5) The acceptance of a message intended for two or more addresses, whether at the same station or at different stations, shall be permitted subject to the provisions prescribed in paragraph 1(2)(c)(iv) of Schedule 1 to these Regulations.

(6) The messages handled for aircraft operating agencies shall be accepted only when handed in to the telecommunication station in the form specified in these Regulations, by an authorised representative of that agency or when received from that agency over an authorised circuit.

29. Transmission and delivery of message

(1) A message accepted under regulation 28 shall be transmitted, relayed and delivered in accordance with the priority classification and without discrimination or undue delay.

(2) A single office for each aircraft that operates an agency shall be designated by agreement between the ANSP and the aircraft that operates an agency concerned for each station of the air navigation service provider from which messages are delivered to one or more aircraft operating agencies.

(3) Stations of the IATS shall be responsible for delivery of messages to an addressee located within the boundaries of the aerodrome served by that station and beyond those boundaries, only to the addressee as may be agreed by special arrangement with the administrations concerned.

(4) The authority shall prescribe a form of written record or other permanent means of delivering messages.

(5) The messages originated in the aeronautical mobile service by an aircraft in flight and which require transmission over the AFTN to effect delivery, shall be reprocessed by the aeronautical telecommunication station prior to transmission on the AFTN.

(6) The messages originated in the aeronautical mobile service by an aircraft in flight and which require transmission over the aeronautical fixed service, other than on an AFTN circuit, shall be reprocessed by the aeronautical telecommunication station into the message format set out in Schedule 1 to these Regulations, except where, subject to subregulation (3), prior or other arrangements have been made between the aeronautical telecommunication agency and the aircraft operating agency concerned for predetermined distribution of messages from aircraft.

(7) The messages without specific address containing—

(a) meteorological information received from an aircraft in flight, shall be forwarded without delay to the meteorological office associated with the point of reception; and

(b) air traffic services information from aircraft in flight shall be forwarded without delay to the air traffic services unit

associated with the communication station receiving the message.

30. Time systems

(1) A station in the aeronautical telecommunication service shall use the universal co-ordinated time system.

(2) The station referred to in subregulation (1) shall designate midnight as 2400 for the end of the day and 0000 for the beginning of the day.

(3) A date-time group shall consist of six figures, the first two figures representing the date of the month and the last four figures representing the hours and minutes in universal co-ordinated time.

31. Record of communications

(1) A station of the aeronautical telecommunication shall maintain a telecommunication log, except an aircraft station when using radiotelephony in direct communication with an aeronautical station.

(2) An aeronautical station shall record messages at the time of their receipt, except that, if during an emergency, the continued manual recording results in delays in communication, the recording of messages may be temporarily interrupted and completed at the earliest opportunity.

(3) Where a record is maintained in an aircraft station, either in a radiotelephone log or elsewhere, concerning distress communications, harmful interference or interruption to communications, the record shall be associated with information concerning the time, position and altitude of the aircraft.

(4) In the case of a written log, entries shall be made only by operators on duty, except that another person who has knowledge of facts pertinent to the entries may certify in the log, the accuracy of entries of the operators.

(5) Superfluous marks or notations shall not be made in the log and all entries shall be complete, clear, correct and intelligible.

(6) A correction in a written log shall be—

- (a) made only by the person making the initial entry;
- (b) accomplished by drawing or typing a single line through the incorrect entry, initialing against the entry, recording the time and date of correction; and
- (c) made on the next line after the last entry.

(7) Written or automatic telecommunication logs shall be retained for a period of at least thirty days and where the logs are pertinent to inquiries or investigations, the logs shall be retained for longer periods until it is evident that they will no longer be required.

(8) The following information shall be entered in every written log—

- (a) the name of the agency operating the station;
- (b) the identification of the station;
- (c) the date;
- (d) the time of opening and closing of the station;
- (e) the signature of each operator, with the time the operator assumes and relinquishes watch;
- (f) the frequencies being guarded and type of watch being maintained on each frequency;
- (g) a record of each communication, test transmission, or attempted communication showing text of communication, time communication completed, station communicated with, and frequency used;
- (h) all distress communications and action;
- (i) a brief description of communication conditions and difficulties, including harmful interference;

- (j) a brief description of interruption to communications due to equipment failure or other trouble, giving the duration of the interruption and action taken; and
- (k) any additional information as may be considered by the operator to be of value as part of the record of the operations of the station.

32. Establishment of radio communication

(1) A station shall answer calls directed to it by other stations in the aeronautical telecommunication service and shall exchange communications on request.

(2) A station shall radiate the minimum power necessary to ensure satisfactory service.

33. Use of abbreviations and codes

(1) The IATS shall use abbreviations and codes whenever they are appropriate and codes shall be used to shorten or facilitate communication.

(2) The originator shall, if required by the Aeronautical Telecommunication Station accepting the message for transmission, make available to that station a decode for the abbreviations and codes used where abbreviations and codes other than those approved by the authority are contained in the text of message.

34. Cancellation of messages

A telecommunication station shall cancel a message where the cancellation is authorised by the message originator.

PART V—AERONAUTICAL FIXED SERVICE (AFS)

35. Systems and applications used in the AFS

The Aeronautical Fixed Service shall comprise the following systems and applications in the IATS —

- (a) air traffic services direct speech circuits and networks;
- (b) meteorological operational circuits, networks and broadcast systems;
- (c) the AFTN;
- (d) the air traffic services message handling services; and
- (e) the inter-centre communications.

36. Material permitted in Aeronautical Fixed Services messages

The material permitted in AFS messages is specified in Schedule 2 to these Regulations.

37. ATS direct speech circuits

The air traffic services direct speech communications shall be those specified in the Civil Aviation (Air Traffic Services) Regulations, 2022.

38. Meteorological operational channels and meteorological operational telecommunication networks

The meteorological operational channel procedures and meteorological operational communication network procedures shall be compatible with the AFTN or ATS Message Handling Services procedures.

Aeronautical Fixed Telecommunication Network (AFTN)

39. Categories of messages

Subject to regulations 28 and 29, the following categories of messages shall be handled by the AFTN —

- (a) distress messages with priority indicator SS which comprise those messages sent by mobile stations reporting that they are threatened by grave and imminent danger and all other messages relative to immediate assistance required by the mobile station in distress;
- (b) urgency messages with priority indicator DD which comprise messages concerning the safety of a ship, aircraft or other vehicles or of a person on board or within sight;

- (c) flight safety messages with priority indicator FF which comprise—
 - (i) movement and control messages;
 - (ii) messages originated by an aircraft operating agency of immediate concern to aircraft in flight or preparing to depart; or
 - (iii) meteorological messages restricted to SIGMET information, special air-reports, AIRMET messages, volcanic ash and tropical cyclone advisory information and amended forecasts;
- (d) meteorological messages with priority indicator GG which comprise—
 - (i) messages concerning forecasts; or
 - (ii) messages concerning observations and reports;
- (e) flight regularity messages with priority indicator GG which comprise —
 - (i) aircraft load messages required for weight and balance computation;
 - (ii) messages concerning changes in aircraft operating schedules;
 - (iii) messages concerning aircraft servicing;
 - (iv) messages concerning changes in collective requirements for passengers, crew and cargo covered by deviation from normal operating schedules;
 - (v) messages concerning non-routine landings;
 - (vi) messages concerning pre-flight arrangements for air navigation services and operational servicing for non-scheduled aircraft operations such as overflight clearance requests;
 - (vii) messages originated by aircraft operating agencies reporting an aircraft arrival or departure; or

- (viii) messages concerning parts and materials urgently required for the operation of aircraft;
- (f) aeronautical information services messages with priority indicator GG which comprise messages concerning NOTAMs;
- (g) aeronautical administrative messages with priority indicator KK which comprise—
 - (i) messages regarding the operation or maintenance of facilities provided for the safety or regularity of aircraft operations;
 - (ii) messages concerning the functioning of aeronautical telecommunication services; or
 - (iii) messages exchanged between civil aviation authorities relating to aeronautical services; and
- (h) service messages with priority indicator as appropriate which comprise messages originated by Aeronautical Fixed Stations to obtain information or verification concerning other messages which appear to have been transmitted incorrectly by the AFS, confirming channel-sequence numbers.

40. Service messages

(1) The service messages shall be prepared in the format prescribed in Schedule 1 to these Regulations.

(2) In applying the provisions of Schedule 1 to these Regulations to service messages addressed to an aeronautical fixed station identified only by a location indicator, the indicator shall be immediately followed by the ICAO three-letter designator YFY, followed by an appropriate 8th letter.

(3) The service messages shall be assigned the appropriate priority indicator.

(4) Where service messages refer to messages previously transmitted, the priority indicator assigned shall be that used for the message to which they refer.

(5) The service messages correcting errors in transmission shall be addressed to all the addressees that shall have received the incorrect transmission.

(6) A reply to a service message shall be addressed to the station which originated the initial service message.

(7) The text of all service messages shall be concise.

(8) A service message, other than the one acknowledging receipt of SS messages, shall be further identified by the use of the abbreviation "SVC" as the first item in the text.

(9) Where a service message refers to a message previously handled, reference to the previous message shall be made by use of the appropriate transmission identification or the filing time and originator indicator groups identifying the previous message.

41. Order of priority

The order of priority for the transmission of messages in the AFTN shall be as follows—

- (a) transmission priority 1 shall comprise of messages with priority indicator SS;
- (b) transmission priority 2 shall comprise of messages with priority indicator DD and FF; and
- (c) transmission priority 3 shall comprise of messages with priority indicator GG and KK.

42. Same priority messages

The messages that have the same priority indicator shall be transmitted in the order in which they are received for transmission.

43. Routing of messages and supervision of message traffic

Where an AFTN is used, the routing of messages and supervision of message traffic shall be as specified in Schedule 3 to these Regulations.

44. Failure of communications

Where an AFTN is used and there exists a communication failure, the requirements stipulated in paragraph 4 of Schedule 3 to these Regulations shall apply.

45. Long term retention of AFTNs traffic records

(1) The AFTN origin stations shall retain, for a period of at least 30 days, all copies of transmitted messages in their entirety.

(2) The AFTNs destination stations shall retain, for a period of at least 30 days, a record containing the information necessary to identify all messages received and the action taken.

(3) The AFTNs communication centres shall retain, for a period of at least 30 days, a record containing the information necessary to identify all messages relayed or retransmitted and the action taken.

46. Short term retention of AFTNs traffic records

(1) The AFTNs communication centres shall retain, for a period of at least one hour, a copy of all messages, in their entirety, retransmitted or relayed by those communication centres, except as provided in subregulation (2).

(2) Where acknowledgement is made between AFTN communication centres, a relay centre shall be considered as having no further responsibility for retransmission or repetition of a message for which it has received positive acknowledgement, and the message may be deleted from its records.

47. Test procedures on AFTNs channels

Test messages transmitted on AFTNs channels for the purposes of testing and repairing lines shall comprise the following—

- (a) the start-of-message signal;
- (b) the procedure signal QJH;
- (c) the originator indicator;
- (d) U (5/5) *(2/10) in IA-5; and
- (e) the end-of-message signal.

48. Characters of AFTN messages

AFTNs messages entered by the AFTNs origin station shall not exceed 2100 characters in length.

49. Stripped address

AFTNs communication centres shall omit from the address all the addressee indicators not required when applying the provisions of paragraph 1(2) of Schedule 1 to these Regulations for—

- (a) onward transmission by the AFTNs communication centre to which the message is transmitted;
- (b) local delivery to the addressee by the AFTNs destination station; or
- (c) an onward transmission or local delivery by the aggregate of stations on a multi-point circuit.

50. Message format — International Alphabet No. 5 (IA-5)

All messages of International Telegraph Alphabet No. 5 shall comply with the message format specified in Schedule 1 to these Regulations.

51. Action taken on mutilated messages in International Telegraph Alphabet No.5 detected in computerised AFTN relay stations

Any action taken on mutilated messages in International Telegraph Alphabet No.5 detected in computerised AFTN relay stations shall be as specified in paragraph 2 of Schedule 1 to these Regulations.

52. Transfer of AFTNs messages over code and byte independent circuits and networks

Where AFTN messages are transferred across code and byte

independent circuits and networks of the AFS, the following shall apply—

- (a) the message shall start with an alignment function followed by the address and, except as provided in paragraph (c), the headline of the message shall be omitted;
- (b) the message shall end with a complete ending;
- (c) entry centres shall be permitted to insert additional data preceding the first alignment function and following the ending of the message for the purposes of technical supervision; and
- (d) where paragraph (c) is applied, the data added shall not include either carriage return or line feed characters or any of the combinations listed in paragraph (3) of Schedule 2 to these Regulations.

53. Air Traffic Services Message Handling Services (ATS-MHS)

The ATS-MHS application shall be used to exchange air traffic services messages between users over the Aeronautical Telecommunication Network internet in accordance with Schedule 4 to these Regulations.

54. Inter-Centre Communications

The Inter-Centre Communications applications set shall be used to exchange air traffic services messages between air traffic service users over the Aeronautical Telecommunication Network internet.

PART VI—AERONAUTICAL MOBILE SERVICE — VOICE COMMUNICATIONS

55. General procedures for aeronautical mobile service - voice communications

(1) The highest standard of discipline shall be observed at all times in all aeronautical mobile service voice communications.

(2) The standardised phraseology of the authority shall be used in all situations for which it has been specified and where the

standardised phraseology cannot serve the intended transmission, plain language shall be used.

(3) The transmission of messages, other than those specified in regulation 56 on aeronautical mobile frequencies when the aeronautical fixed services are able to serve the intended purpose, shall be avoided.

(4) In all communications, the consequences of human performance which affect the accurate reception and comprehension of messages shall be taken into consideration.

(5) Where it is necessary for an aircraft station to send signals for testing or adjustment which may interfere with the working of a neighbouring aeronautical station, the consent of the station shall be obtained before the signals are sent and any such transmissions shall be kept to a minimum.

(6) Where it is necessary for a station in the aeronautical mobile service to make test signals, either for the adjustment of a transmitter before making a call or for the adjustment of a receiver, the signals shall not continue for more than 10 seconds and shall be composed of spoken numerals in radiotelephony, followed by the radio call sign of the station transmitting the test signals and any such transmissions shall be kept to a minimum.

(7) The responsibility of establishing communication shall rest with the station having traffic to transmit, except as otherwise provided in these Regulations.

(8) After a call is made to an aeronautical station, a period of at least 10 seconds shall elapse before a second call is made.

(9) Where an aeronautical station is called simultaneously by several aircraft stations, the aeronautical station shall decide the order in which the aircraft shall communicate.

(10) In communications between aircraft stations, the duration of communication shall be controlled by the aircraft station receiving the communication, subject to the intervention of an aeronautical station.

(11) Where the communications in subregulation (10) take place on an air traffic service frequency, the prior permission of the aeronautical station shall be obtained but a request for permission shall not be required for brief exchanges.

56. Categories of messages

The categories of messages handled by the aeronautical mobile service and the order of priority in the establishment of communications and the transmission of messages shall be in accordance with table 5.1 prescribed in Schedule 5 to these Regulations.

57. Communication related to direction finding

The communications relating to direction finding shall be handled in accordance with these Regulations.

58. Composition of flight safety messages

The flight safety messages shall comprise—

- (a) movement and control messages;
- (b) messages originated by an aircraft operating agency or by an aircraft, of immediate concern to an aircraft in flight;
- (c) meteorological advice of immediate concern to an aircraft in flight or about to depart; or
- (d) other messages concerning aircraft in flight or about to depart.

59. Composition of meteorological messages

The meteorological messages shall comprise of meteorological information to or from aircraft, other than messages specified in regulation 61.

60. Composition of flight regularity messages

The flight regularity messages shall comprise—

- (a) The messages regarding the operation or maintenance of facilities essential for the safety or regularity of aircraft operation;
- (b) messages concerning the servicing of aircraft;
- (c) instructions to aircraft operating agency representatives concerning changes in requirements for passengers and crew caused by unavoidable deviations from normal operating schedules;
- (d) messages concerning non-routine landings to be made by an aircraft;
- (e) messages concerning aircraft parts and materials urgently required; and
- (f) messages concerning changes in aircraft operating schedules.

61. Handling of flight regularity messages

Air traffic services units using direct pilot controller communication channels shall only be required to handle flight regularity messages where the messages can be achieved without interference with their primary role and where no other channels are available for the handling of the messages.

62. Composition of inter-pilot air-to-air communication

(1) Inter-pilot air-to-air communication shall comprise messages relating to any matter affecting safety and regularity of flights.

(2) The category and priority of the messages under subregulation (1) shall be determined on the basis of their content, in accordance with regulations 58 and 60.

63. Cancellation of messages

(1) The station transmitting the message shall instruct the receiving station to disregard an incomplete transmission if a message

has not been completely transmitted when instructions to cancel are received, and the instructions shall be effected in radiotelephony by use of an appropriate phrase.

(2) Where a completed message transmission is being held pending correction and the receiving station is to be informed to take no forwarding action, or where delivery or onward relay cannot be accomplished, the transmission shall be cancelled and the cancellation shall be effected in radiotelephony by the use of an appropriate phrase.

(3) The station cancelling a transmission shall be responsible for any further action required.

64. Radiotelephony procedures

The radiotelephony procedures for aeronautical mobile service - voice communication shall be as specified in Schedule 6 to these Regulations.

65. Distress and urgency radio telephony communication procedures

The distress and urgency radiotelephony communication procedures for aeronautical mobile service - voice communication shall be as specified in Schedule 7 to these Regulations.

66. Communications relating to acts of unlawful interference

The station addressed by an aircraft subjected to an act of unlawful interference or the first station acknowledging a call from such an aircraft, shall render all possible assistance, including notification of appropriate air traffic service units and any other station, agency or person in a position to facilitate the flight.

PART VII— AERONAUTICAL RADIO NAVIGATION SERVICE

67. Composition of aeronautical radio navigation service

(1) The aeronautical radio navigation service shall comprise all types and systems of radio navigation aids in the international aeronautical service.

(2) An aeronautical radio navigation aid which is not in continuous operation shall, where practicable, be put into operation on receipt of a request from an aircraft, a controlling authority on the ground or an authorised representative of an aircraft operating agency.

(3) The request referred to in subregulation (2) shall be made to the aeronautical station concerned on the air-ground frequency normally in use.

(4) The local aeronautical information service unit shall be furnished, without delay with essential information about changes in the operational status of non-visual aids as required for pre-flight briefing and dissemination in accordance with the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

68. Aeronautical radio navigation service direction finding

(1) A direction-finding station working alone shall when requested give the following—

- (a) a true bearing of the aircraft, using the appropriate phrase;
- (b) a true heading to be steered by the aircraft, with no wind, to head for the direction-finding station using the appropriate phrase;
- (c) a magnetic bearing of the aircraft, using the appropriate phrase; and
- (d) the magnetic heading to be steered by the aircraft with no wind to make for the station, using the appropriate phrase.

(2) Where direction-finding stations work as a network to determine the position of an aircraft, the bearings taken by each station shall be sent immediately to the station controlling the direction-finding network to enable the position of the aircraft to be determined.

(3) The station controlling the network referred to in subregulation shall, upon request, give the aircraft its position—

- (a) in relation to a point of reference or in latitude and longitude, using the appropriate phrase;
- (b) the true bearing of the aircraft in relation to the direction-finding station or other specified point, using the appropriate phrase and its distance from the direction finding station or point, using the appropriate phrase; or
- (c) the magnetic heading to steer with no wind, to make for the direction-finding station or other specified point and its distance from the direction-finding station or point, using the appropriate phrases.

(4) An aircraft station shall make requests for bearings, courses or positions, to the aeronautical station responsible or to the station controlling the direction-finding network.

(5) The aircraft station referred to in subregulation (4) shall call the aeronautical station or the direction-finding control station on the listening frequency and specify the type of service that is desired using the appropriate phrase.

(6) The direction-finding station originally called by the aircraft station shall where necessary—

- (a) request transmission for direction-finding service; and
- (b) indicate the frequency to be used by the aircraft station, the number of times the transmission shall be repeated, the duration of the transmission required or any special transmission requirement, as soon as the direction-finding station or group of stations are ready.

(7) An aircraft station which requests a bearing shall end the transmission by repeating its call sign in radiotelephony.

(8) An aircraft shall give a longer transmission for two periods of approximately ten seconds or alternatively provide such other signals as may be requested by the direction-finding station if the transmission specified in subregulation (7) is too short for the direction-finding station to obtain a bearing.

(9) A direction-finding station shall request the aircraft station to repeat a transmission if not satisfied with its observation.

(10) The direction-finding station shall advise the aircraft station when a heading or bearing has been requested in the following form—

- (a) the appropriate phrase;
- (b) bearing or heading in degrees in relation to the direction-finding station, sent as three figures;
- (c) the class of bearing; and
- (d) the time of observation, if necessary.

(11) Where a position has been requested, the direction finding control station shall after plotting all simultaneous observations determine the observed position of the aircraft and shall advise the aircraft station in the following form when a position has been requested –

- (a) the appropriate phrase;
- (b) the position;
- (c) the class of the position; and
- (d) the time of observation.

(12) The aircraft station shall repeat back the message for confirmation or correction as soon as the aircraft station has received the bearing, heading or position from the direction finder.

(13) Where positions are given by bearing or heading and distance from a known point other than the station making the report, the reference point shall be an aerodrome, prominent town or geographic feature.

(14) Subject to subregulation (13), an aerodrome shall be given a preference to other places.

(15) Where a large city or town is used as a reference place as specified in subregulation (13), the bearing or heading and the distance given shall be measured from its centre.

(16) Where the position is expressed in latitude and longitude, groups of figures for degrees and minutes shall—

- (a) be used followed by letter N or S for latitude and the letter E or W for longitude, respectively; or
- (b) use the words NORTH, SOUTH, EAST or WEST in radiotelephony.

(17) The direction-finding station estimates of the accuracy of observations, bearings and positions shall be classified as follows—

- (a) Bearings—
 - (i) Class A — accurate within plus or minus 2 degrees;
 - (ii) Class B — accurate within plus or minus 5 degrees;
 - (iii) Class C — accurate within plus or minus 10 degrees; and
 - (iv) Class D — accuracy less than Class C;
- (b) Positions—
 - (i) Class A — accurate within 9.3 km (5 NM);
 - (ii) Class B — accurate within 37 km (20 NM);
 - (iii) Class C — accurate within 92 km (50 NM); and
 - (iv) Class D — accuracy less than Class C.

(18) A direction-finding station shall have authority to refuse to give bearings, heading or positions where conditions are unsatisfactory or where bearings do not fall within the calibrated limits of the station and shall state the reason at the time of refusal.

69. Broadcast material

An originator of a broadcast material shall prepare a text of broadcast material in the form desired for transmission.

70. Frequencies and schedules

(1) A broadcast station shall make broadcasts on specified frequencies at specified times and the schedules and frequencies of all broadcasts shall be made public in the appropriate documents.

(2) Where the broadcast station makes a change in frequencies or times, the change shall—

- (a) be made public by NOTAM at least two weeks before the change; and
- (b) be announced on all regular broadcasts for 48 hours preceding the change and shall be transmitted once at the beginning and once at the end of each broadcast, where practicable.

(3) Scheduled broadcasts other than sequential collective type broadcasts, shall be started at the scheduled time by the general call.

(4) A short notice shall be transmitted at the scheduled time, advising recipients to “stand by” and stating the approximate number of minutes of delay where a broadcast is to be delayed.

(5) The broadcast shall not be started until the end of the standby period as stated in subregulation (4).

(6) The transmission shall be terminated by each station promptly at the end of the allotted time period whether or not transmission of all material has been completed, where broadcasts are conducted on a time allotment basis.

(7) In sequential collective type broadcasts, each station shall be ready to commence its broadcasts at the designated time and

where, for any reason, a station does not commence its broadcast at the designated time, the station immediately following in sequence shall wait and commence its broadcast at its own designated time.

71. Radiotelephone broadcast procedures

An aeronautical broadcasting service shall comply with the radiotelephone broadcast procedures specified in Schedule 8 to these Regulations.

72. Interruption of service

(1) A broadcast shall be made by another station, if possible, in the event of interruption of service at the station responsible for broadcast, until normal service is resumed.

(2) Where the broadcast in subregulation (1) is not possible, and the broadcast is of the type intended for interception by fixed stations, the stations which are required to copy the broadcasts shall continue to listen on the specified frequencies until normal service is resumed.

PART IX—AERONAUTICAL MOBILE SERVICE — DATA LINK
COMMUNICATIONS

73. Composition of data link messages

The composition of data link messages for aeronautical mobile service – data link communication shall be as specified in the paragraph 2 of Schedule 9 to these Regulations.

74. Display of data link messages

(1) Ground and airborne systems shall allow for messages to be appropriately displayed, printed when required and shall be stored in a manner that permits timely and convenient retrieval.

(2) The English language shall be displayed as a minimum whenever textual presentation is required.

75. Controller pilot data link communication procedures

The controller pilot data link communication procedures in aeronautical mobile service – data link communication shall be as specified in paragraph 3 of Schedule 9 to these Regulations.

PART X—EXEMPTIONS

76. Requirements for application for exemption

(1) A person may apply to the authority for exemption from a provision of these Regulations.

(2) Except for an emergency, a person who requires an exemption from a provision of these Regulations shall apply to the authority, not less than sixty days before the proposed date of the exemption and shall give the following information—

- (a) the name of the applicant and contact address, including electronic mail and fax, if any;
- (b) telephone number;
- (c) a citation of the specific requirement from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of operations to be conducted under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) an explanation of how the exemption would be in the public interest;
- (h) a detailed description of the alternative means by which the applicant will ensure a level of safety equivalent to that established by the regulation in question;
- (i) a safety risk assessment carried out in respect of the exemption applied for;
- (j) where the applicant handles international operations and seeks to operate under the proposed exemption, an

indication whether the exemption would contravene any provision of the standards and recommended practices of ICAO; and

(k) any other information that the authority may require.

(3) An application for exemption shall be accompanied by a fee prescribed by the authority.

(4) Where the applicant seeks emergency processing of an application for an exemption, the application shall contain supporting facts and reasons for not filing the application within the time specified in subregulation (2) and satisfactory reasons for deeming the application an emergency.

(5) The authority may, in writing, refuse an application made under subregulation (3), where, in the opinion of the authority, the reasons given for emergency processing are not satisfactory.

77. Review and publication

(1) The authority shall review the application for an exemption made under regulation 76 for accuracy and compliance and where the application is satisfactory, the authority shall publish a detailed summary of the application for comments, within a prescribed time, in either—

- (a) the Uganda Gazette;
- (b) the aeronautical information circular; or
- (c) a daily newspaper with nationwide circulation.

(2) Where the application requirements have not been fully complied with, the authority shall request the applicant, in writing, to comply prior to publication or making a decision under subregulation (3).

(3) Where the request is for emergency relief, the authority shall publish the decision as soon as possible after processing the application.

78. Evaluation of the request

(1) Where the application requirements have been satisfied, the authority shall conduct an evaluation of the request which shall include—

- (a) a determination of whether an exemption would be in the public interest;
- (a) a determination, after a technical evaluation, of whether the applicant's proposal would provide a level of safety equivalent to that established by these Regulations; but where the authority determines that a technical evaluation of the request would impose a significant burden on the technical resources of the authority, the authority may deny the exemption on that basis;
- (b) a determination of whether a grant of the exemption would contravene these Regulations; and
- (c) a recommendation, based on the preceding elements, of whether the request should be granted or denied, and of any conditions or limitations that should be part of the exemption.

(2) Where the authority determines that a technical evaluation of the request would impose a significant burden on the technical resources of the authority, the authority may deny the exemption on that basis.

(3) The authority shall notify the applicant in writing, of the decision to grant or deny the request and shall give a detailed summary of its evaluation and decision.

(4) The summary referred to in subregulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(5) The authority shall, where the exemption affects a significant population of the aviation community of Uganda, publish the summary in an aeronautical information circular.

79. Drug and alcohol testing and reporting

(1) A person who performs any function prescribed by these Regulations directly or by contract may be tested for drug or alcohol usage.

(2) A person who—

(a) refuses to submit to a test to indicate the percentage by weight of alcohol in the blood; or

(b) refuses to submit to a test to indicate the presence of narcotic drugs, marijuana or depressant or stimulant drugs or substances in the body when requested by a law enforcement officer or the authority, or refuses to furnish or to authorise the release of the test results requested by the authority shall—

(i) not be issued a licence, certificate, rating, qualification or other authorisation under these Regulations for a period of up to one year from the date of that refusal; or

(ii) have his or her licence, certificate, rating, qualification, or other authorisation issued under these Regulations suspended or revoked.

(3) A person convicted for the violation of any law relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances, shall—

(a) not be issued a licence, certificate, rating, qualification, or other authorisation issued under these Regulations for a period of up to one year after the date of conviction; or

(b) have his or her licence, certificate, rating, qualification, or other authorisation issued under these Regulations suspended or revoked.

80. Change of name

(1) An ANSP holding a certificate issued under these Regulations may apply to the authority for—

- (a) replacement of the certificate, where the certificate is lost or destroyed;
- (b) change of name on the certificate; or
- (c) an endorsement on the certificate.

(2) The holder of a certificate shall submit to the authority together with the application under subregulation (1) —

- (a) a copy of the original certificate if any, in case of loss; and
- (b) a court order or other legal document verifying the change of name.

(3) The authority shall return to the holder of a certificate, with the appropriate changes applied for and, if any, the original certificate referred to in subregulation (2), but where necessary shall retain copies of the certificate.

81. Change of address

(1) A holder of an ANSP certificate issued under these Regulations shall notify the authority of any change in the physical or mailing address of the holder within fourteen days of the change.

(2) A person who does not notify the authority of the change in the physical or mailing address within fourteen days shall not exercise the privileges of the certificate.

82. Replacement of documents

A person may apply to the authority, in the prescribed form, for replacement of any document issued under these Regulations if the documents are lost or destroyed.

83. Use and retention of documents and records

(1) A person shall not—

- (a) use any certificate or exemption issued or required by or under these Regulations which is forged, altered, cancelled, or suspended, or to which he is not entitled;
- (b) forge or alter any certificate or exemption issued or required by or under these Regulations;
- (c) lend any certificate or exemption issued or required by or under these Regulations to any other person;
- (d) make any false representation for the purpose of procuring for himself or herself or any other person, the grant, issue, renewal or variation of any certificate or exemption issued or required by or under these Regulations; or
- (e) mutilate, alter, render illegible or destroy any records, or any entry made therein, required by or under these Regulations to be maintained, or knowingly make, or procure or assist in the making of, any false entry in any such record, or willfully omit to make a material entry in such record.

(2) All records required to be maintained by or under these Regulations shall be recorded in a permanent and indelible form.

(3) A person shall not issue any certificate or exemption under these Regulations unless –

- (a) he or she is authorised to do so by the authority; and
- (b) he or she is satisfied that all statements in the certificate are correct and that the applicant is qualified to hold that certificate.

84. Report of violations

(1) A person who knows of a violation of these Regulations shall report the violation to the authority.

(2) The authority shall determine the nature and type of investigation or enforcement action to be taken in respect of a violation reported under subregulation (1).

85. Failure to comply with directions

A person who fails to comply with any direction given to him or her by the authority or by an authorised person under these Regulations shall be deemed, for the purposes of these Regulations, to have contravened that provision.

86. Aeronautical fees

(1) The authority shall, by notice in writing, specify the fees to be charged in connection with the issue, renewal or variation of any certificate, test, inspection or investigation required by, or for the purpose of these Regulations or any orders, notices or proclamations made under these Regulations.

(2) Where an application is made in connection with which any fee is chargeable in accordance with subregulation (1), the applicant shall pay the prescribed fee before the application is accepted.

(3) Where, after payment is made in accordance with subregulation (1), the application is withdrawn by the applicant or otherwise ceases to have effect or is refused, the authority shall not refund the payment made.

PART XII— OFFENCES AND PENALTIES

87. Offences and penalties

(1) A person who contravenes these Regulations or an order, notice or proclamation made under these Regulations commits an offence and is liable, on conviction, to a fine not exceeding one million shillings or imprisonment not exceeding six months or both; and in the case of a continuing contravention, each day of the contravention shall constitute a separate offence.

(2) Notwithstanding subregulation (1), a person who contravenes any provision of convicted of an offence under these Regulations may have his or her certificate or exemption revoked, cancelled or suspended.

(3) A person convicted of an offence under these Regulations may have his or her certificate or exemption revoked, cancelled or suspended by the authority.

(4) A court convicting a person of an offence under these Regulations may in addition to any penalty imposed by the court, order for the revocation, cancellation or suspension of the certificate or exemption of the person convicted.

(5) Where it is proved that an act or omission of a person, which would otherwise have been a contravention by that person of these Regulations, or of an order, notice or proclamation made under these Regulations, was due to a cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of these Regulations, order, notice or proclamation.

88. Appeals

A person aggrieved by any order of the authority made under these Regulations may, within twenty-one days of the making of the order, appeal to the tribunal.

PART XIII—REVOCATION, SAVINGS AND TRANSITIONAL

89. Revocation of S.I. 26 of 2020 Savings and Transitional

(1) The Civil Aviation (Aeronautical Communications Procedures) Regulations, 2020 are revoked.

(2) A certificate of registration, exemption or order issued under the Civil Aviation (Aeronautical Communications Procedures) Regulations, 2020 and which is valid immediately before the commencement of these Regulations, shall have effect as if granted under these Regulations.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, exemption or any other approval granted under subregulation (2), a person who at the commencement of these Regulations is carrying out any act, duty, or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer time as the Minister may by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Any person who fails to comply with subregulation (3) is liable to have a licence, certificate, authorisation, exemption or any other approval canceled in accordance with the provisions of these Regulations.

SCHEDULES

SCHEDULE 1

Regulations 28 (5), 40 (2), 49,50 and 51.

1. MESSAGE FORMAT — INTERNATIONAL ALPHABET NO. 5 (IA-5)-

When it has been agreed between the administrations concerned to use International Alphabet No. 5 (IA-5) the format described in this Schedule shall be used. All messages, other than those prescribed in regulation 47 shall comprise the components specified in subparagraphs (1) to (6) inclusive.

Note 1.— An illustration of the IA-5 message format is given in Figure 3-1.

Note 2.— In the subsequent standards relative to message format the following symbols have been used in making reference to the functions assigned to certain signals in IA-5. Symbol Signification

< CARRIAGE RETURN (character position 0/13)

≡ LINE FEED (character position 0/10)

→ SPACE (character position 2/0).

- (1) The heading shall comprise—
 - (a) start-of-heading (SOH) character 0/1;
 - (b) transmission identification comprising—
 - (i) circuit or link identification; and
 - (ii) channel-sequence number;
 - (c) additional service information (if necessary) comprising:
 - (i) one SPACE; and
 - (ii) no more than 10 characters.
 - (d) on point-to-point circuits or links, the identification shall consist of three letters selected and assigned by the transmitting station; the first letter identifying the transmitting, the second letter the

receiving end of the circuit, and the third letter the channel. Where only one channel exists, the letter A shall be assigned.

Where more than one channel between stations is provided, the channels shall be identified as A, B, C, etc., in respective order. On multipoint channels, the identification shall consist of three letters selected and assigned by the circuit control or master station.

- (e) except as provided in sub-paragraph (5) three-digit channel-sequence numbers from 001 to 000 (representing 1 000) shall be assigned sequentially by telecommunication stations to all messages transmitted directly from one station to another. A separate series of these numbers shall be assigned for each channel and a new series shall be started daily at 0000 hours.
- (f) the expansion of the channel-sequence number to preclude duplication of the same numbers during the 24-hour period shall be permitted subject to agreement between the Authorities responsible for the operation of the circuit.
- (g) the transmission identification shall be sent over the circuit in the following sequence—
 - (i) transmitting-terminal letter;
 - (ii) receiving-terminal letter;
 - (iii) channel-identification letter;
 - (iv) channel-sequence number.
- (g) Additional service information shall be permitted to be inserted following the transmission identification subject to agreement between the Authorities responsible for the operation of the circuit. Such additional service information shall be preceded by a SPACE (→) followed by not more than 10 characters inserted into the heading of message immediately following the last digit of the channel-sequence number and shall not contain any alignment functions. When no such additional service information is added the information in subparagraph (2)(f) shall be followed immediately by that of subparagraphs (3) and (4).
- (2) The address shall comprise:
 - (a) alignment function [$\ll\equiv$];

- (b) priority indicator;
- (i) the priority indicator shall consist of the appropriate two-letter group assigned by the originator in accordance with the following:

| Priority indicator | Message category |
|---------------------------|---|
| SS | distress messages |
| DD | urgency messages |
| FF | flight safety messages |
| GG | meteorological messages |
| GG | flight regularity messages |
| GG | aeronautical information services messages |
| KK | aeronautical administrative messages, as appropriate service messages |

- (ii) The order of priority shall be the same as specified in regulation 41.
- (c) addressee indicator(s).
- (i) An addressee indicator, which shall be immediately preceded by a SPACE, except when it is the first address indicator of the second or third line of addresses, shall comprise:
- (aa) the four-letter location indicator of the place of destination;
- (ab) the three-letter designator identifying the organisation or function (aeronautical authority, service or aircraft operating agency) addressed;
- (ac) an additional letter, which shall represent a department, division or process within the organisation or function addressed. The letter X shall be used to complete the address when explicit identification is not required.
- (ii) Where a message is to be addressed to an organisation that has not been allocated an ICAO three-letter designator of

the type prescribed in subparagraph (3)(c)

- (iii) the location indicator of the place of destination shall be followed by the ICAO three-letter designator YYY (or the ICAO three-letter designator YXY in the case of a military service or organisation). The name of the addressee organisation shall then be included in the first item in the text of the message. The eighth position letter following the ICAO three-letter designator YYY or YXY shall be the filler letter X.
- (iv) Where a message is to be addressed to an aircraft in flight and, therefore, requires handling over the AFTN for part of its routing before retransmission over the Aeronautical Mobile Service, the location indicator of the aeronautical station which is to relay the message to the aircraft shall be followed by the ICAO three-letter designator ZZZ. The identification of the aircraft shall then be included in the first item of the text of the message. The eighth position letter following the ICAO three-letter designator ZZZ shall be the filler letter X.
- (v) The complete address shall be restricted to three lines of page-printing copy, and, except as provided in paragraph 2, a separate addressee indicator shall be used for each addressee whether at the same or different locations.
- (vi) The completion of the addressee indicator group(s) in the address of a message shall be immediately followed by the alignment function.
- (vii) Where messages are offered in page-copy form for transmission and contain more addressee indicators than can be accommodated on three lines of a page copy, such messages shall be converted, before transmission, into two or more messages, each of which shall conform with the provisions of subparagraph (3)(a)(v). During such conversion, the addressee indicators shall, in so far as practicable, be positioned in the sequence which will ensure that the minimum number of retransmissions will be required at subsequent communication centres.

| Message part | | Component of the message part | Elements of the component | Teletypewriter character |
|---|--------------|---|---|--------------------------|
| H E A D I N G | HEADING LINE | Start-of-Heading Character | One Character (0/1) | SOH |
| | | Transmission Identification | a) Transmitting-terminal letter b) Receiving-terminal letter c) Channel-identification letter d) Channel-sequence number | - |
| | | If necessary, additional Service Indication | e) One SPACE f) No more than the remainder of the line | → |
| | ADDRESS | Alignment function | One CARRIAGE RETURN, one LINE FEED | <CR> |
| | | Priority Indicator | The relevant 2-letter group | - |
| | | Addressee Indicator(s) | One SPACE and an 8-letter group <i>Example:</i> <i>EGLLRZX→EGLLYKYX→EGLLACAD</i> | |
| | | Alignment Function(s) | One CARRIAGE RETURN, one LINE FEED | <CR> |
| | ORIGIN | Filing time | 6 digit date-time group specifying when the message was filed for transmission | |
| | | Originator indicator | g) One SPACE h) 8-letter group identifying the message originator | →..... |
| | | Priority Alarm(used only in teletypewriter operation for distress messages) | Five characters (0/1)(BEL) | |
| Optional Heading Information | | i) One SPACE j) Additional data not to exceed the remainder of the line | | |
| Alignment function | | One CARRIAGE RETURN, one LINE FEED | <CR> | |
| Start of text character | | One character (0/2) | STX | |

| | | | |
|--------|--------------------------------------|---|------|
| TEXT | Beginning of Text | <p>Specific identification of Addressees (<i>if necessary</i>) with each followed by on CARRIAGE RETURN, one LINE FEED (<i>if necessary</i>)</p> <p>The English word FROM (<i>if necessary</i>)</p> <p>Specific identification of Originator (<i>if necessary</i>)</p> <p>The English word STOP followed by one CARRIAGE RETURN, one LINE FEED (<i>if necessary</i>) and/or Originator's reference (<i>if used</i>)</p> | |
| | Message Text | Message Text with one CARRIAGE RETURN, one LINE FEED at the end of each printed line of the Text except for the last one | |
| | Confirmation (<i>if necessary</i>) | <p>k) One CARRIAGE RETURN, one LINE FEED</p> <p>l) The abbreviation CFM followed by the portion of the TEXT being confirmed.</p> | |
| | Correction (<i>if necessary</i>) | <p>m) One CARRIAGE RETURN, one LINE FEED</p> <p>n) The abbreviation COR followed by the correction of an error made in the preceding TEXT</p> | |
| ENDING | Alignment function | One CARRIAGE RETURN, one LINE FEED | <CR> |
| | Page-feed Sequence | One character (0/11) | VT |
| | End-of-Text Character | One character (0/3) | ETX |

Figure 1-1. Message format International Alphabet No. 5 (IA-5)

- (3) The origin shall comprise:
- (a) filing time which shall comprise the 6-digit date-time group indicating the date and time of filing the message for transmission;
 - (b) originator indicator which shall be immediately preceded by a SPACE and comprise:
 - (i) the four-letter location indicator of the place at which the message is originated;
 - (ii) the three-letter designator identifying the organisation or function (aeronautical authority, service or aircraft operating agency) which originated the message;
 - (iii) an additional letter to represent a department, division or process within the organisation or function of the originator and letter X to complete the address when explicit identification is not required;
 - (c) where a message is originated by an organisation that has not been allocated an ICAO three-letter designator of the type prescribed in paragraph 2 (1)(6) of Schedule 2, the location indicator of the place at which the message is originated shall be followed immediately by the ICAO three-letter designator YYY followed by the filler letter X (or the ICAO three-letter designator YXY followed by the filler letter X in the case of a military service or organisation). The name of the organisation (or military service) shall then be included in the first item in the text of the message.
 - (d) Messages relayed over the Aeronautical Fixed Telecommunication Network that have been originated in other networks shall use a valid AFTN originator indicator that has been agreed for use by the relay or gateway function linking the AFTN with the external network.
 - (e) Where a message originated by an aircraft in flight requires handling on the Aeronautical Fixed Telecommunication Network for part of its routing before delivery, the originator indicator shall comprise the location indicator of the aeronautical station responsible for transferring the message to the AFTN, followed immediately by the ICAO three-letter designator ZZZ.

followed by the filler letter X. The identification of the aircraft shall then be included in the first item in the text of the message.

- (f) When necessary, priority alarm shall be used only for distress messages and consist of five successive BEL (0/7) characters;

Note.— Use of the priority alarm will actuate a bell (attention) signal at the receiving teletypewriter station, other than at those fully automatic stations which may provide a similar alarm on receipt of priority indicator SS, thereby alerting supervisory personnel at relay centres and operators at tributary stations, so that immediate attention may be given to the message.

- (g) optional heading information that shall be included in the origin line provided a total of 69 characters is not exceeded and subject to agreement between the Administrations concerned. The presence of the optional data field shall be indicated by one occurrence of the SPACE character immediately preceding optional data alignment function;
- (h) start-of-text character, character 0/2 (STX); and
- (i) When additional addressing information in a message needs to be exchanged between source and destination addresses, it shall be conveyed in the optional data field (ODF), using the following specific format:
 - (i) characters one and full stop (1.) to indicate the parameter code for the additional address function;
 - (ii) three modifier characters, followed by an equal sign (=) and the assigned 8-character ICAO address; and
 - (iii) the character hyphen (-) to terminate the additional address parameter field.
 - (iv) When a separate address for service messages or inquiries is different from the originator indicator, the modifier SVC shall be used.
 - (v) The origin line shall be concluded by an alignment function [$\ll\equiv$] and the start-of-text (STX) (0/2) character.

(4) Text

- (a) The text of messages shall be drafted in accordance with subparagraph (6)(h) and shall consist of all data between STX and ETX.
- (b) When an originator's reference is used, it shall appear at the beginning of the text, except as provided in subparagraphs (f) and (g).
- (c) When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the addressee indicator and it, therefore, becomes necessary to identify in the text the specific addressee of the message, such identification group shall precede the originator's reference (if used) and become the first item of the text.
- (d) When the ICAO three-letter designators YXY, YYY or ZZZ comprise the second element of the originator indicator and it thus becomes necessary to identify in the text the name of the organisation (or military service) or the aircraft which originated the message, such identification shall be inserted in the first item of the text of the message.
- (e) When applying the provisions of subparagraphs (f) and (g) to messages where the ICAO three-letter designator(s) YXY, YYY, ZZZ refer to two or more different organisations (or military services), the sequence of further identification in the text shall correspond to the complete sequence used in the address and originator indicator of the message. In such instance, each addressee identification shall be followed immediately by an alignment function. The name of the (YXY, YYY or ZZZ) organisation originating the message shall then be preceded with "FROM". "STOP" followed by an alignment function shall then be included in the text at the end of this identification and preceding the remainder of text.
- (f) An alignment function shall be transmitted at the end of each printed line of the text. When it is desired to confirm a portion of the text of a message in teletypewriter operation, such confirmation shall be separated from the last text group by an alignment function [\leq] and shall be indicated by the abbreviation CFM followed by the portion being confirmed.

- (g) Where messages are prepared off-line, e.g. by preparation of a paper tape, errors in the text shall be corrected by backspacing and replacing the character in error by character DEL (7/15).
- (h) Corrections to textual errors made in on-line operations shall be corrected by inserting →E→E→E→ following the error, then retyping the last correct word (or group).
- (i) When it is not discovered until later in the origination process that an error has been made in the text, the correction shall be separated from the last text group, or confirmation, if any, by an alignment function [\llcorner]. This shall be followed by the abbreviation COR and the correction.
- (j) Stations shall make all indicated corrections on the page-copy prior to local delivery or a transfer to a manually operated circuit.
- (k) When messages are transmitted only on low-speed circuits, the text of messages entered by the AFTN origin station shall not exceed 1 800 characters in length. AFTN messages exceeding 1 800 characters shall be entered by the AFTN origin station in the form of separate messages

Note 1. — Low-speed circuits operate at 300 bits per second or less.

Note 2. — The character count includes all printing and non-printing characters in the text from, but not including, the start-of-text signal to, but not including, the first alignment function of the ending.

- (i) The transmission on medium- or high-speed circuits of AFTN messages with text exceeding 1 800 characters that have not been entered by the AFTN origin station in the form of separate messages shall be subject to agreement between the administrations concerned and not diminish the performance characteristics of the network or link.

Note 1. — Medium-speed circuits operate at speeds in the range between 300 and 3 000 bits per second. High-speed circuits operate at speeds in excess of 3 000 bits per second.

Note 2.— The character count includes all printing and non-printing characters in the text from, but not including,

(5) Ending

- (a) The ending of a message shall comprise the following in the order stated:
 - (i) an alignment [\lll] function following the last line of text;
 - (ii) page-feed character, character 0/11 (VT);
 - (iii) end-of-text character 0/3 (ETX).
- (b) Station terminal equipment (page printers) on the International Alphabet Number 5 (IA-5) shall be provided with a capability to generate sufficient line feed functions for local station use upon the reception of a VERTICAL TAB character (0/11).
- (c) When the message does not transit ITA-2 portions of the AFTN, or where Administrations have made provisions to add automatically the second carriage return before transmission to an ITA-2 circuit, one carriage return in the alignment function and end-of-line function shall be permitted subject to agreement between the administrations concerned.
- (d) Messages entered by the AFTN origin station shall not exceed 2 100 characters in length, when transmitted only on low-speed circuits.

Note 1.— Low-speed circuits operate at 300 bits per second or less.

Note 2.— The character count includes all printing and nonprinting characters in the message from and including the start-of-heading character (SOH) to and including the end-of-text character.

- (e) The transmission on medium- or high-speed circuits of AFTN messages exceeding 2 100 characters that have not been entered by the AFTN origin station in the form of separate messages shall be subject to agreement between the Administrations concerned and not diminish the performance characteristics of the network or link.

Note 1.— Medium-speed circuits operate at speeds in the range between 300 and 3 000 bits per second. High-speed circuits operate at speeds in excess of 3 000 bits per second.

Note 2.— The character count includes all printing and non-printing characters in the message from and including the start-of-heading character (SOH) to and including the end-of-text character.

- (f) Except as provided in subparagraphs (6)(h) to (6)(k), the procedures of regulations 49 to 51 shall be used for messages using IA-5 code.
- (g) The transmission of message texts that do not require conversion to the IA-2 code and format and with message lines containing more than 69 printable and non-printable characters shall be subject to agreement between the Administrations concerned
- (h) Channel-check transmissions- In the case where continuous control of channel condition is not provided the following periodic transmissions shall be sent on teletypewriter circuits:
 - (i) heading line; S
 - (ii) alignment function T; X
 - (iii) the procedure signal CH; E
 - (iv) alignment function T. X
- (i) A receiving station shall check the transmission identification of the incoming transmission specified in sub-paragraph (h) to ensure its correct sequence in respect of all messages received over that incoming channel.

Note.— Application of this procedure provides some measure of assurance that channel continuity is maintained; however, a continuously controlled channel is much more preferable in that data integrity can also be improved.

- (j) Where a circuit is unoccupied and uncontrolled, the transmission identified in subparagraph (6)(h) shall be sent at H + 00, H + 20, H + 40.
- (k) The receipt of distress messages (priority indicator SS) shall be individually acknowledged by the AFTN destination station by sending a service message to the AFTN origin station. Such acknowledgement of receipt shall take the format of a complete message addressed to the AFTN origin station, shall be assigned priority indicator SS and the associated priority alarm, and shall have a text comprising:

- (i) the procedure signal R;
- (ii) the origin line without priority alarm, or optional heading information of the message being acknowledged;
- (iii) the ending.

Note.— The following example illustrates the application of the subparagraph (6)(k) procedures:

Heading

<≡ SS → LECBZRZX <≡

121322 → EGLLYFYX (Priority Alarm) <≡ S

TR → 121319 → LECBZRZX <≡ X

Ending.

2. Action taken on mutilated messages in IA-5 detected in computerised AFTN relay stations

(1) On channels employing continuous control the mutilation detection and subsequent recovery shall be a function of the link control procedures and shall not require the subsequent sending of service or CHECK TEXT NEW ENDING ADDED messages.

(2) On channels not employing continuous control the relay station shall employ the following procedures:

- (a) If, during the reception of a message a relay station detects that the message has been mutilated at some point ahead of the end-of-text character, it shall;
 - (i) cancel the onward routing responsibility for the message; and
 - (ii) send a service message to the transmitting station requesting a retransmission.

Note.— The following example illustrates a typical text of a service message in which the foregoing procedure has been applied in respect of a mutilated message:

SVC→QTA→RPT→ABC 123

- (b) When the provisions of subparagraph (2)(a) are applied, the station receiving the service message shall reassume responsibility for the referenced message with a new (correct in sequence) transmission identification. If that station is not in possession of an unmutated copy of the original message, it shall send a message to the originator as identified by the originator indicator in the origin of the mutilated message, requesting repetition of the incorrectly received message.

Note.— The following example illustrates a typical text of a service message in which the foregoing procedure has been applied in respect of a mutilated message having as its origin

“141335 CYULACAX”:

SVC→QTA→RPT→141335→CYULACAX (ending)

(3) If, after transmission of the text material of a message, a relay station can detect that there is no complete end-of-text character, but has no practical means of discovering whether the irregularity has affected only the end-of-text character, or whether it has also caused part of the original text to have been lost, it shall insert into the channel the following:

- (a) <≡CHECK≡TEXT≡NEW→ENDING→ADDED
- (b) its own station identification;
- (c) (ending).

3. Transfer of AFTN messages over code and byte independent circuits and networks

(1) When AFTN messages are transferred across code and byte independent circuits and networks of the AFS, the following shall apply.

- (a) Except as provided in subparagraph (1)(c) the heading line of the message shall be omitted. The message shall start with an alignment function followed by the address.
- (b) The message shall end with a complete ending.
- (c) For the purposes of technical supervision, entry centres shall be

permitted to insert additional data preceding the first alignment function and/or following the ending of the message.

- (d) When the provisions of subparagraph (1)(c) are applied, the data added shall not include either carriage return or line feed characters or any of the combinations listed in paragraph 1 (3) of Schedule 1 to these Regulations.

SCHEDULE 2

Regulations 29 (6), 36 and 52 (d)

MATERIAL PERMITTED IN AFS MESSAGES

1. Material permitted in AFS messages

Note.— *The provisions contained in this Schedule do not apply to ATS voice communications.*

(1) The following characters are allowed in text messages:

Letters: ABCDEFGHIJKLMNOPQRSTUVWXYZ

Figures: 1 2 3 4 5 6 7 8 9 0

Other signs: - (hyphen)

? (question mark)

: (colon)

((open bracket)

) (close bracket)

. (full stop, period, or decimal point)

, (comma)

' (apostrophe)

= (double hyphen or equal sign)

/ (oblique)

+ (plus sign)

Characters other than those listed above shall not be used in messages unless absolutely necessary for understanding of the text. When used, they shall be spelled out in full.

(2) For the exchange of messages over the teletypewriter circuits, the following characters of International Alphabet No. 5 (IA-5) shall be permitted:

— characters 0/1 to 0/3, 0/7

— in the priority alarm, 0/10, 0/11

— in the ending sequence, 0/13;

- characters 2/0, 2/7 to 2/9, 2/11 to 2/15;
- characters 3/0 to 3/10, 3/13, 3/15;
- characters 4/1 to 4/15;
- characters 5/0 to 5/10; and
- character 7/15.

Note.— The foregoing provisions are not intended to prevent the use of the full IA-5 after agreement between the administrations concerned.

(3) Roman numerals shall not be employed. If the originator of a message wishes the addressee to be informed that roman figures are intended, the Arabic figure or figures shall be written and preceded by the word ROMAN.

(4) Messages using IA-5 shall not contain:

- (i) character 0/1 (SOH) other than the one in the heading;
- (ii) character 0/2 (STX) other than the one in the origin line;
- (iii) character 0/3 (ETX) other than the one in the ending;
- (iv) any uninterrupted sequence of characters 5/10, 4/3, 5/10, 4/3 in this order (ZCZC);
- (v) any uninterrupted sequence of characters 2/11, 3/10, 2/11, 3/10 in this order (+:+:);
- (vi) any uninterrupted sequence of four times character 4/14 (NNNN); and
- (vii) any uninterrupted sequence of four times character 2/12 (,,,,).

(5) The text of messages shall be drafted in plain language or in abbreviations and codes as prescribed in regulation 33. The originator shall avoid the use of plain language when reduction in the length of the text by appropriate abbreviations and codes is practicable. Words and phrases which are not essential, such as expressions of politeness, shall not be used.

(6) If the originator of a message wishes alignment functions [\llcorner] to be transmitted at specific places in the text part of such message, the sequence [\llcorner] shall be written on each of those places.

SCHEDULE 3

Regulations 43 and 44

MESSAGE ROUTING

1. Routing of messages

(1) All communications shall be routed by the most expeditious route available to effect delivery to the addressee.

(2) Predetermined diversion routing arrangements shall be made, when necessary, to expedite the movement of communication traffic. Each communication centre shall have the appropriate diversion routing lists, agreed to by the administration(s) operating the communication centres affected and shall use them when necessary.

(3) For purposes of subparagraph (2), diversion routing shall be initiated—

(a) in a fully automatic communication centre—

(i) immediately after detection of the circuit outage, when the traffic is to be diverted via a fully automatic communication centre;

(ii) within a 10-minute period after detection of the circuit outage, when the traffic is to be diverted via a non-fully automatic communication centre; and

(b) in a non-fully automatic communication centre within a 10-minute period after detection of the circuit outage.

(4) As soon as it is apparent that it will be impossible to dispose of traffic over the AFS within a reasonable period, and when the traffic is held at the station where it was filed, the originator shall be consulted regarding further action to be taken, unless—

(a) otherwise agreed between the station concerned and the originator; or

(b) arrangements exist whereby delayed traffic is automatically diverted to commercial telecommunication services without reference to the originator.

Note.— The expression “reasonable period” means a period of time such that it seems probable that the traffic will not be delivered to the addressee within any fixed transit period applicable to the category of traffic concerned, or, alternatively, any predetermined period agreed between originators and the telecommunication station concerned.

2. Supervision of message traffic

(1) Continuity of message traffic. The receiving station shall check the transmission identification of incoming transmissions to ensure the correct sequence of channel sequence numbers of all messages received over that channel.

- (a) When the receiving station detects that one or more channel-sequence numbers are missing, it shall send a complete service message to the previous station rejecting receipt of any message that may have been transmitted with such missing number(s). The text of this service message shall comprise the signal QTA, the procedure signal MIS followed by one or more missing transmission.

Note.— The following examples illustrate application of the above-mentioned procedure. In example 2) the hyphen (-) separator is understood to mean “through” in plain language.

- (1) *when one channel-sequence number is missing:*

SVC→QTA→MIS→ABC↑123↓<≡

- (2) *when several channel-sequence numbers are missing:*

SVC→QTA→MIS→ABC↑123-126↓<≡

- (b) When the provisions of subparagraph (a) are applied, the station notified of the missing message(s) condition by the service message shall reassume its responsibility for transmission of the message (or messages) that it had previously transmitted with the transmission identification concerned, and shall retransmit that message (or those messages) with a new (correct in sequence) transmission identification. The receiving station shall synchronise such that the next expected channel-sequence number is the last received channel-sequence number plus one.

- (c) When the receiving station detects that a message has a channel sequence number less than that expected, it shall advise the previous station using a service message with a text comprising:
 - (i) the abbreviation SVC;
 - (ii) the procedure signal LR followed by the transmission identification of the received message;
 - (iii) the procedure signal EXP followed by the transmission identification expected; and
 - (iv) the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→LR→ABC↑123→↓EXP→ABC↑135↓<≡

- (d) When the provisions of subparagraph (c) are applied, the station receiving the out-of sequence message shall synchronise such that the next expected channel-sequence number is the last received channel-sequence number plus one. The previous station shall check its outgoing channel-sequence numbers and, if necessary, correct the sequence.

3. Misrouted messages

Note.— *A message is considered to have been misrouted is it contains no relaying instructions, expressed or implied, on which the receiving station can take action.*

- (1) When the receiving station detects that a message has been misrouted to it, it shall either:
 - (a) send a service message to the previous station rejecting receipt of the misrouted message; or
 - (b) itself assume responsibility for transmission of the message to all addressee indicators.

Note.— *The procedure of paragraph (2) may be preferred at stations using fully automatic relay methods or a semi-automatic relay technique without continuous tape.*

(2) When the provisions of subparagraph (1) are applied, the text of the service message shall comprise the abbreviation SVC, the signal QTA, the procedure signal MSR followed by the transmission identification and of the misrouted message and the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→QTA→MSR→ABC↑123↓<≡

(3) When, as a result of the provisions of subparagraph (2) , a sending station is notified of the misrouted message condition by service message, it shall reassume its responsibility for the message and shall retransmit as necessary on the correct outgoing channel or channels.

(4) When a circuit becomes interrupted and alternative facilities exist, the last channel-sequence numbers sent and received shall be exchanged between the stations concerned. Such exchanges shall take the form of complete service messages with the text comprising the abbreviation SVC, the procedure signals LR and LS followed by the transmission identifications of the relevant messages and the end-of-text signal.

Note.— The following example illustrates application of the above-mentioned procedure:

SVC→LR→ABC↑123↓→LS→BAC↑321↓<≡

4. Failure of communications

(1) Where communication on any fixed service circuit fails, the station concerned shall attempt to re-establish contact as soon as possible.

(2) If contact cannot be re-established within a reasonable period on the normal fixed service circuit, an appropriate alternative circuit shall be used and attempts shall be made to establish communication on any other authorised fixed service circuit available.

(3) If the attempts in subparagraphs (1) and (2) fail, use of any available air-ground frequency shall be permitted only as an exceptional and temporary measure when no interference to aircraft in flight is ensured.

(4) Where a radio circuit fails due to signal fadeout or adverse propagation conditions, a receiving watch shall be maintained on the regular

fixed service frequency normally in use. In order to re-establish contact on this frequency as soon as possible there shall be transmitted:

- (a) the procedure signal DE;
- (b) the identification of the transmitting station transmitted three times;
- (c) the alignment function [\lll];
- (d) the letters RY repeated without separation for three lines of page copy;
- (e) the alignment function [\lll]; and
- (f) end-of-message signal (NNNN). The foregoing sequence shall be repeated as required.

(5) A station experiencing a circuit or equipment failure shall promptly notify other stations with which it is in direct communication if the failure will affect traffic routing by those stations. Restoration to normal shall also be notified to the same stations.

(6) Where diverted traffic will not be accepted automatically or where a predetermined diversion routing has not been agreed, a temporary diversion routing shall be established by the exchange of service messages. The text of such service messages shall comprise:

- (a) the abbreviation SVC;
- (b) the procedure signal QSP;
- (c) if required, the procedure signal RQ, NO or CNL to request, refuse or cancel a diversion;
- (d) identification of the routing areas, States, territories, locations, or stations for which the diversion applies; and
- (e) the end-of-text signal.

Note.— The following examples illustrate application of the above-mentioned procedures:

- a) to request a diversion:

SVC→QSP→RQ→C→K→BG→BI↓ \lll

b) to accept a diversion:

SVC→QSP→C→K→BG→BI↓<≡

c) to refuse a diversion:

SVC→QSP→NO→C→K→BG→BI↓<≡

d) to cancel a diversion:

SVC→QSP→CNL→C→K→BG→BI↓<≡

SCHEDULE 4

Regulation 53

1. ATS MESSAGE HANDLING SERVICES (ATSMHS) AND INTER-CENTRE COMMUNICATIONS (ICC)

(1) ATS MESSAGE HANDLING SERVICES (ATSMHS)

The ATS message service of the ATS (air traffic services) message handling service (ATSMHS) application shall be used to exchange ATS messages between users over the Aeronautical Telecommunication Network (ATN) internet.

Note: Connections may be established over the internet communications service between any pair constituted of these ATN end systems as shown in Table 4-1.

Table 4-1: Communications between ATN end systems implementing ATS message handling services

| | |
|--------------------|------------------------|
| ATN End System 1 | ATN End System 2 |
| ATS Message Server | ATS Message Server |
| ATS Message Server | AFTN / AMHS Gateway |
| ATS Message Server | ATS Message User Agent |
| AFTN /AMHS Gateway | AFTN / AMHS Gateway |

(2) Inter-Centre Communications (ICC)

The inter-centre communications (ICC) applications set shall be used to exchange ATS messages between air traffic service users over the ATN internet.

Note 1.— The ICC applications set enables the exchange of information in support of the following operational services:

- (a) flight notification;*
- (b) flight coordination;*
- (c) transfer of control and communications;*

- (d) *flight planning;*
- (e) *airspace management; and*
- (f) *air traffic flow management.*

Note 2.— The first of the applications developed for the ICC set is the ATS interfacility data communication (AIDC).

Note 3.— The AIDC application exchanges information between ATS units (ATSUs) for support of critical air traffic control (ATC) functions, such as notification of flights approaching a flight information region (FIR) boundary, coordination of boundary conditions and transfer of control and communications authority.

Note 4.— The AIDC application is strictly an ATC application for exchanging tactical control information between ATS units. It does not support the exchange of information with other offices or facilities.

Note 5.— The AIDC application supports the following operational services:

- (a) *flight notification;*
- (b) *flight coordination;*
- (c) *transfer of executive control;*
- (d) *transfer of communications; and*
- (e) *transfer of general information (flight-related data or free text messages, i.e. unstructured).*

SCHEDULE 5

Regulation 56

AERONAUTICAL MOBILE SERVICE — VOICE COMMUNICATIONS

1. Categories of messages in aeronautical mobile service — voice communications

The categories of messages handled by the aeronautical mobile service and the order of priority in the establishment of communications and the transmission of messages shall be in accordance with the following table.

Table 5-1: Categories of Messages

| | Message category and order of priority | Radiotelephony signal |
|-----|---|------------------------------|
| a) | Distress call, distress messages and distress traffic | MAYDAY |
| b) | Urgency messages, including messages preceded by the medical transports signals | PAN, PAN or PAN, PAN MEDICAL |
| c) | Communications relating to direction finding | - |
| d) | Flight safety messages | - |
| e) | Meteorological messages | - |
| f). | Flight regulatory messages | - |

SCHEDULE 6

Regulations 64

1. General

RADIOTELEPHONY PROCEDURES

(1) When a controller or pilot communicates via voice, the response shall be via voice. Except when a controller or pilot communicates via controller-pilot data link communications, the response shall be via controller-pilot data link communications.

2. Language to be used

(1) The air-ground radiotelephony communications shall be conducted in the language normally used by the station on the ground or in the English language.

(2) The English language shall be available, on request from any aircraft station, at all stations on the ground serving designated airports and routes used by international air services.

(3) The languages available at a given station on the ground shall form part of the Aeronautical Information Publications and other published aeronautical information concerning such facilities.

(4) When proper names, service abbreviations and words of which the spelling is doubtful are spelled out in radiotelephony the alphabet in Figure 6-1 shall be used.

Figure 6-1: illustration of service abbreviations and words.

| | | Approximate pronunciation | |
|--------|---------|-----------------------------------|-------------------------------|
| Letter | Word | International phonetic convention | Latin alphabet representation |
| A | Alfa | ‘ælfɑ | <u>AL</u> FAH |
| B | Bravo | ‘brɑ:’vɒ | <u>BRAH</u> VOH |
| C | Charlie | ‘tʃɑ:li or ‘ʃɑ:li | CHAR LEE OR SHAR LEE |
| D | Delta | ‘delta | DELL TAH |
| E | Echo | ‘eko | <u>ECK</u> OH |
| F | Foxtrot | ‘fɒkstrɒt | FOKS TROT |
| G | Golf | gɒlf | GOLF |
| H | Hotel | ho:’tel | HO <u>TELL</u> |

| | | | |
|---|----------|-------------------------|---|
| I | India | indi□ɑ | <u>IN</u> DEE AH |
| J | Juliett | ‘dʒu:li□’et | <u>JEW</u> LEE <u>ETT</u> |
| K | Kilo | ‘ki:lo | <u>KEY</u> LOH |
| L | Lima | ‘li:ma | <u>LEE</u> MAH |
| M | Mike | maik | MIKE |
| N | November | no’vembə | NO <u>VEM</u> BER |
| O | Oscar | ‘ɔska | <u>OSS</u> CAH |
| P | Papa | pə’pa | PAH <u>PAH</u> |
| Q | Quebec | ke’bek | KEH <u>BECK</u> |
| R | Romeo | ‘ro:mi□o | <u>ROW</u> ME OH |
| S | Sierra | si’era | SEE <u>AIR</u> RAH |
| T | Tango | ‘tængo | <u>TANG</u> GO |
| U | Uniform | ‘ju:nifɔ:m ‘u:nifɔ:m | or YOU NEE FORM OR <u>OO</u> NEE FORM |
| V | Victor | ‘vikta | <u>VIK</u> TAH |
| W | Whiskey | ‘wiski | <u>WISS</u> KEY |
| X | X-ray | ‘eks’rei | <u>ECKS</u> RAY |
| Y | Yankee | ‘jæŋki | <u>YANG</u> KEY |
| Z | Zulu | ‘zu:lu: | <u>ZOO</u> LOO |

3. Transmission of numbers

(1) All transmission of numbers, except as prescribed in subparagraphs (2) to (6) shall be transmitted by pronouncing each digit separately.

The following examples illustrate the application of this procedure

Figure 6-2: Illustration of transmission of numbers except as prescribed in subparagraph (7) to (11)

| Aircraft Call Signs | TransmittedAs |
|-------------------------|-------------------------------|
| CCA 238 | Air China two three eight |
| OAL 242 | Olympic two four two |
| Headings | TransmittedAs |
| 100 degrees | heading one zero zero |
| 080 degrees | heading zero eight zero |
| Wind Direction AndSpeed | TransmittedAs |
| 200 degrees 70 knots | wind one six zero degrees one |

| | |
|----------------------|---|
| 160 degrees 18 knots | wind one six zero degrees one gusting 30 knots eight knots gusting three zero knots |
| Runway | TransmittedAs |
| 27 | runway two seven |
| 30 | runway three zero |

(2) Flight levels shall be transmitted by pronouncing each digit separately except for the case of flight levels in whole hundreds, which shall be transmitted by pronouncing the digit of the whole hundred followed by the word HUNDRED.

Figure 6-3. Example of Flight Level Transmission

| Flight Levels | Transmitted as |
|----------------------|------------------------------------|
| FL180 | flight level one eight zero |
| FL 200 | flight level two hundred |

(3) The altimeter setting shall be transmitted by pronouncing each digit separately except for the case of a setting of 1 000 hPa which shall be transmitted as ONE THOUSAND.

Figure 6-4 Example of Altimeter setting Transmission

| <i>altimeter setting</i> | <i>transmitted as</i> |
|--------------------------|-------------------------------|
| 1009 | QNH one zero zero nine |
| 1000 | QNH one thousand |
| 993 | QNH nine nine three |

(4) All numbers used in the transmission of transponder codes shall be transmitted by pronouncing each digit separately except that, when the transponder codes contain whole thousands only, the information shall be transmitted by pronouncing the digit in the number of thousands followed by the word THOUSAND.

Figure 6-5; Example of transmission of numbers of transponder code

| <i>transponder codes</i> | <i>transmitted as</i> |
|--------------------------|----------------------------------|
| 2400 | squawk two four zero zero |
| 1000 | squawk one thousand |
| 2000 | squawk two thousand |

(5) All numbers used in the transmission of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate. Combinations of thousands and whole hundreds shall be transmitted by pronouncing each digit in the number of thousands followed by the word THOUSAND followed by the number of hundreds followed by the word HUNDRED.

Figure 6-6: Example of transmission of numbers of altitude, cloud height, visibility and RVR.

| <i>altitude</i> | <i>transmitted as</i> |
|----------------------------|---------------------------------------|
| 800 | eight hundred |
| 3400 | three thousand four hundred |
| 12000 | one two thousand |
| <i>cloud height</i> | <i>transmitted as</i> |
| 2200 | two thousand two hundred |
| 4300 | four thousand three hundred |
| <i>visibility</i> | <i>transmitted as</i> |
| 1000 | visibility one thousand |
| 700 | visibility seven hundred |
| <i>runway visual range</i> | <i>transmitted as</i> |
| 600 | RVR six hundred |
| 1700 | RVR one thousand seven hundred |

(6) When providing information regarding relative bearing to an object or to conflicting traffic in terms of the 12-hour clock, the information shall be given pronouncing the double digits as TEN, ELEVEN, or TWELVE [O’CLOCK].

(7) Numbers containing a decimal point shall be transmitted as prescribed in sub-paragraph (1) with the decimal point in appropriate sequence being indicated by the word DECIMAL.

Note 1.— The following examples illustrate the application of this procedure:

| | |
|---------------|---|
| <i>Number</i> | <i>Transmitted as</i> |
| 100.3 | ONE ZERO ZERO DECIMAL THREE, |
| 38143.9 | THREE EIGHT ONE FOUR THREE DECIMAL NINE |

(8) When transmitting time, only the minutes of the hour shall normally be required. Each digit shall be pronounced separately. However, the hour shall be included when any possibility of confusion is likely to result.

| | |
|------------------|--|
| <i>Time</i> | <i>Statement</i> |
| 0920 (9:20 A.M.) | TOO ZE-RO <i>or</i> ZE-RO NIN-er TOO ZE-RO |
| 1643 (4:43 P.M.) | FOW-er TREE <i>or</i> WUN SIX FOW-er TREE |

4. Verification and pronunciation of numbers

(1) When it is desired to verify the accurate reception of numbers the person transmitting the message shall request the person receiving the message to read back the numbers.

(2) When the language used for communication is English, numbers shall be transmitted using the following pronunciation:

Figure 6-7 Illustration of communication of numbers in English

| Number or numeral element | Pronunciation |
|---------------------------|---------------|
| 0 | ZE-RO |
| 1 | WUN |
| 2 | TOO |
| 3 | TREE |
| 4 | FOW-er |
| 5 | FIFE |
| 6 | SIX |
| 7 | SEV-EN |

| | |
|----------|-------------|
| 8 | AIT |
| 9 | NIN-er |
| 10 | DAY-SEE-MAL |
| Hundred | HUN -dred |
| Thousand | TOU-SAND |

Note.— The syllables printed in capital letters in the above list are to be stressed; for example, the two syllables in ZE-RO are given equal emphasis, whereas the first syllable of FOW-er is given primary emphasis.

5. Transmission techniques

(1) Each written message shall be read prior to commencement of transmission in order to eliminate unnecessary delays in communications.

(2) Transmissions shall be conducted concisely in a normal conversational tone.

(3) Speech transmitting technique shall be such that the highest possible intelligibility is incorporated in each transmission. Fulfilment of this aim requires that air crew and ground personnel shall:

- (a) enunciate each word clearly and distinctly;
- (b) maintain an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its contents need to be recorded the speaking rate shall be at a slower rate to allow for the writing process. A slight pause preceding and following numerals makes them easier to understand;
- (c) maintain the speaking volume at a constant level;
- (d) be familiar with the microphone operating techniques particularly in relation to the maintenance of a constant distance from the microphone if a modulator with a constant level is not used; and
- (e) suspend speech temporarily if it becomes necessary to turn the head away from the microphone.

(4) Speech transmitting technique shall be adapted to the prevailing communications conditions.

(5) Messages accepted for transmission shall be transmitted in plain language or ICAO phraseologies without altering the sense of the message in any way. Approved ICAO abbreviations contained in the text of the message to be transmitted to aircraft shall normally be converted into the unabbreviated words or phrases which these abbreviations represent in the language used, except for those which, owing to frequent and common practice, are generally understood by aeronautical personnel.

(6) To expedite communication, the use of phonetic spelling shall be dispensed with, if there is no risk of this affecting correct reception and intelligibility of the message.

(7) The transmission of long messages shall be interrupted momentarily from time to time to permit the transmitting operator to confirm that the frequency in use is clear and, if necessary, to permit the receiving operator to request repetition of parts not received.

(8) The following words and phrases shall be used in radiotelephony communications as appropriate and shall have the meaning ascribed hereunder:

| <i>Phrase</i> | <i>Meaning</i> |
|---------------|---|
| ACKNOWLEDGE | “Let me know that you have received and understood this message.” |
| AFFIRM | “Yes.” |
| APPROVED | “Permission for proposed action granted.” |
| BREAK | “I hereby indicate the separation between portions of the message.” |

(To be used where there is no clear distinction between the text and other portions of the message.)

| | |
|-------------|---|
| BREAK BREAK | “I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment.” |
| CANCEL | “Annul the previously transmitted clearance.” |
| CHECK | “Examine a system or procedure.” |

(Not to be used in any other context. No answer is normally expected.)

| | |
|-----------------|---|
| CLEARED | “Authorized to proceed under the conditions specified.” |
| CONFIRM | “I request verification of: (clearance, instruction, action, information).” |
| CONTACT | “Establish communications with...” |
| CORRECT | “True” or “Accurate”. |
| CORRECTION | “An error has been made in this transmission (or message indicated). The correct version is...” |
| DISREGARD | “Ignore.” |
| HOW DO YOU READ | “What is the readability of my transmission?” |
| MAINTAIN | SAY AGAIN “I repeat for clarity or emphasis.” “Continue in accordance with the condition(s) specified” or in its literal sense, e.g. “Maintain VFR”. |
| MONITOR | “Listen out on (frequency).” |
| NEGATIVE | “No” or “Permission not granted” or “That is not correct” or “Not capable”. |
| OVER | “My transmission is ended, and I expect a response from you.” |

Note.— Not normally used in VHF or satellite voice communications.

| | |
|-----|--|
| OUT | “This exchange of transmissions is ended and no response is expected.” |
|-----|--|

Note.— Not normally used in VHF or satellite voice communications.

| | |
|-----------|---|
| READ BACK | “Repeat all, or the specified part, of this message back to me exactly as received.” |
| RECLEARED | “A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.” |
| REPORT | “Pass me the following information...” |
| REQUEST | “I should like to know...” or “I wish to obtain...” |
| ROGER | “I have received all of your last transmission.” |

Note.— Under no circumstances to be used in reply to a question requiring “READ BACK” or a direct answer in the affirmative (AFFIRM) or negative (NEGATIVE).

SAY AGAIN “Repeat all, or the following part, of your last transmission.”
SPEAK SLOWER “Reduce your rate of speech.”

Note.— For normal rate of speech.

STANDBY “Wait and I will call you.”

Note.— The caller would normally re-establish contact if the delay is lengthy. STANDBY is not an approval or denial.

UNABLE “I cannot comply with your request, instruction, or clearance.”

Note.— UNABLE is normally followed by a reason.

WILCO (Abbreviation for “will comply”.)
 “I understand your message and will comply with it.”

WORDS TWICE a) As a request: “Communication is difficult. Please send every word, or group of words, twice.”
b) As information: “Since communication is difficult, every word, or group of words, in this message will be sent twice.”

6. Composition of Messages

(1) Messages handled entirely by the aeronautical mobile service shall comprise the following parts in the order stated:

- (a) call indicating the addressee and the originator; and
- (b) text.

Note.— The following examples illustrate the application of this procedure:

(call) NEW YORK RADIO SWISSAIR ONE ONE ZERO
(text) REQUEST SELCAL CHECK or
(call) SWISSAIR ONE ONE ZERO NEW YORK RADIO
(text) CONTACT SAN JUAN ON FIVE SIX

(2) Messages requiring handling by the AFTN for part of their routing and similarly messages which are not handled in accordance with predetermined distribution arrangements shall be composed as follows:

- (3) When originated in an aircraft:
 - (a) call;
 - (b) the word FOR;
 - (c) the name of the organisation addressed;
 - (d) the name of the station of destination; and
 - (e) the text.

(4) The text shall be as short as practicable to convey the necessary information; full use shall be made of ICAO phraseologies.

Note.— The following example illustrates the application of this procedure: (call)

BOSTON RADIO SWISSAIR ONE TWOEIGHT (*address*) FOR SWISSAIR
BOSTON (*text*) NUMBER ONE ENGINE CHANGE REQUIRED

(5) When addressed to an aircraft. When a message is retransmitted by an aeronautical station to an aircraft in flight, the heading and address of the AFTN message format shall be omitted during the retransmission on the aeronautical mobile service.

- (a) When the provisions of subparagraph 28 are applied, the aeronautical mobile service message transmission shall comprise:
 - (i) the text [incorporating any corrections (COR) contained in the AERONAUTICAL FIXED TELECOMMUNICATION NETWORK message];
 - (ii) the word FROM;
 - (iii) the name of the originating organisation and its location (taken from the origin section of the AFTN message).

- (b) When the text of a message to be transmitted by an aeronautical station to an aircraft in flight contains approved ICAO abbreviations, these abbreviations shall normally be converted during the transmission of the message into the unabbreviated words or phrases which the abbreviations represent in the language used, except for those which, owing to frequent or common practice, are generally understood by aeronautical personnel.

7. Radiotelephony call signs for aeronautical stations

(1) Aeronautical stations in the aeronautical mobile service shall be identified by—

- (a) the name of the location; and
(b) the unit or service available.

(2) The unit or service shall be identified in accordance with the table below except that the name of the location or the unit or service may be omitted provided satisfactory communication has been established.

| Unit/ service available | Call Sign suffix |
|-----------------------------------|-------------------------|
| area control centre | CONTROL |
| approach control | APPROACH |
| approach control radar arrivals | ARRIVAL |
| approach control radar departures | DEPARTURE |
| aerodrome control | TOWER |
| surface movement control | GROUND |
| radar (in general) | RADAR |
| precision approach radar | PRECISION |
| direction finding station | HOMER |
| flight information service | INFORMATION |
| clearance delivery | DELIVERY |
| apron control | APRON |
| company dispatch | DISPATCH |
| aeronautical station | RADIO |

8. Radiotelephony call signs for aircraft

(1) An aircraft radiotelephony call sign shall be one of the following types:

- (a) Type a) — the characters corresponding to the registration marking of the aircraft; or
- (b) Type b) — the telephony designator of the aircraft operating agency, followed by the last four characters of the registration marking of the aircraft; and
- (c) Type c) — the telephony designator of the aircraft operating agency, followed by the flight identification.

(2) The aircraft radiotelephony call signs shown in sub-paragraph (31), with the exception of Type c), may be abbreviated in the circumstances prescribed in subparagraph (42). Abbreviated call signs shall be in the following form:

- (a) Type a) — the first character of the registration and at least the last two characters of the call sign;
- (b) Type b) — the telephony designator of the aircraft operating agency, followed by at least the last two characters of the call sign; and
- (c) Type c) — no abbreviated form.

Table 5-1: Examples of full call signs and abbreviated call signs

| | | <i>Type a)</i> | <i>Type b)</i> | <i>Type c)</i> |
|-----------------------|---------|----------------|----------------|-----------------------------|
| Full call sign | N 57826 | *CESSNA | *CITATION | VARIG SCANDINAVIAN |
| | | FABCD | FABCD | PVMA 937 |
| Abbreviated call sign | N26 | CESSNA | CITATION | VARIG (no abbreviated form) |
| | | CD | CD | MA |
| | or | or | or | or |
| | N826 | CESSNA | CITATION | VARIG |
| | | BCD | BCD | VMA |

Note.— Either the name of the aircraft manufacturer or of the aircraft model may be used in place of the first character in Type a).

9. Radiotelephony procedures

(1) An aircraft shall not change the type of its radiotelephony call sign during flight, except temporarily on the instruction of an air traffic control unit in the interests of safety.

(2) Except for reasons of safety no transmission shall be directed to an aircraft during take-off, during the last part of the final approach or during the landing roll.

(3) Full radiotelephony call signs shall always be used when establishing communication. The calling procedure of an aircraft establishing communication shall be in accordance with Table 5-2.

Table 5-2 Radiotelephony calling procedure

| | type (a) | type (b) | Type (c) |
|------------------------------------|---------------|------------------|---------------------|
| Designation of the station called | NEWYORK RADIO | NEWYORK RADIO | N E W Y O R K RADIO |
| designation of the station calling | GABCD*** | SPEEDBIRD ABCD** | AEROFLOT 321*** |

(4) Stations having a requirement to transmit information to all stations likely to intercept shall preface such transmission by the general call ALL STATIONS, followed by the identification of the calling station.

(5) The reply to the above calls shall be in accordance with Table 5-3. The use of the calling aeronautical station’s call sign followed by the answering aeronautical station’s call sign shall be considered the invitation to proceed with transmission by the station calling.

Table 5-3. Radiotelephony reply procedure

| | Type a) | Type b) | Type c) |
|--------------------------------------|----------------|-----------------|----------------|
| Designation of the station called | GABCD* | SPEEDBIRD ABCD* | AEROFLOT321* |
| Designation of the answering station | NEW YORK RADIO | NEW YORK RADIO | NEW YORK RADIO |

* *With the exception of the telephony designators and the type of aircraft, each character in the call sign shall be spoken separately. When individual letters are spelled out, the radiotelephony spelling alphabet prescribed in subparagraph 2(4) shall be used. Numbers are to be spoken in accordance with paragraph 3.*

(6) When a station is called but is uncertain of the identification of the calling station, it shall reply by transmitting the following:

STATION CALLING . . . (station called) SAY AGAIN YOUR CALL SIGN

Note.— The following example illustrates the application of this procedure:

(CAIRO station replying) STATION CALLING CAIRO (pause) SAY AGAIN YOUR CALL SIGN

(7) Communications shall commence with a call and a reply when it is desired to establish contact, except that, when it is certain that the station called will receive the call, the calling station may transmit the message, without waiting for a reply from the station called.

(8) Interpilot air-to-air communication shall be established on the air- to-air channel 123.45 MHz by either a directed call to a specific aircraft station or a general call, taking into account conditions pertaining to use of this channel.

(9) As the aircraft may be guarding more than one frequency, the initial call shall include the distinctive channel identification “INTERPILOT”.

Note.— The following examples illustrate the application of this calling procedure.

CLIPPER 123 — SABENA 901 — INTERPILOT — DO YOU READ *or*
ANY AIRCRAFT VICINITY OF 30 NORTH 160 EAST — JAPANAIR 401
— INTERPILOT — OVER

10. Subsequent radiotelephony communications

(1) Abbreviated radiotelephony call signs shall be used only after satisfactory communication has been established and provided that

no confusion is likely to arise. An aircraft station shall use its abbreviated call sign only after it has been addressed in this manner by the aeronautical station.

(2) After contact has been established, continuous two-way communication shall be permitted without further identification or call until termination of the contact.

(3) In order to avoid any possible confusion, when issuing ATC clearances and reading back such clearances, controllers and pilots shall always add the call sign of the aircraft to which the clearance applies.

11. Indication of transmitting channels

(1) As the aeronautical station operator generally guards more than one frequency, the call shall be followed by an indication of the frequency used, unless other suitable means of identifying the frequency are known to exist.

(2) When no confusion is likely to arise, only the first two digits of the High Frequency (in kHz) shall be used to identify the transmitting channel.

Note.— The following example illustrates the application of this procedure:

(PAA 325 calling Kingston on 8 871 kHz)

KINGSTON CLIPPER THREE TWO FIVE — ON EIGHT EIGHT

(3) Except as specified in sub-paragraph (48) all six digits of the numerical designator shall be used to identify the transmitting channel in VHF radiotelephony communications, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits shall be used.

Note 1.— The following examples illustrate the application of the procedure in sub-paragraph (3):

| <i>channel</i> | <i>Transmitted as</i> |
|----------------|--------------------------------------|
| 118.000 | ONE ONE EIGHT DECIMAL ZERO |
| 118.005 | ONE ONE EIGHT DECIMAL ZERO ZERO FIVE |
| 118.010 | ONE ONE EIGHT DECIMAL ZERO ONE ZERO |
| 118.025 | ONE ONE EIGHT DECIMAL ZERO TWO FIVE |
| 118.050 | ONE ONE EIGHT DECIMAL ZERO FIVE ZERO |
| 118.100 | ONE ONE EIGHT DECIMAL ONE |

Note 2.— Caution must be exercised with respect to the indication of transmitting channels in VHF radiotelephony communications when all six digits of the numerical designator are used in airspace where communication channels are separated by 25 kHz, because on aircraft installations with a channel separation capability of 25 kHz or more, it is only possible to select the first five digits of the numerical designator on the radio management panel.

(4) In airspace where all VHF voice communications channels are separated by 25 kHz or more and the use of six digits as in sub-paragraph

(3) is not substantiated by the operational requirement determined by the appropriate authorities, the first five digits of the numerical designator shall be used, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits shall be used.

Note 1.— The following examples illustrate the application of the procedure in sub-paragraph (4) and the associated settings of the aircraft radio management panel for communication equipment with channel separation capabilities of 25 kHz and 8.33/25 kHz:

| Channel | Transmitted as | <i>Radio management panel setting for communication equipment with</i> | |
|---------|-----------------------------------|--|-------------------------------|
| | | <i>25KHz (5digits)</i> | <i>8.33/25 kHz (6 digits)</i> |
| 118.000 | ONE ONE EIGHT DECIMAL ZERO | 118.000 | 118.000 |
| 118.025 | ONE ONE EIGHT DECIMAL ZERO TWO | 118.02 | 118.025 |

| | | | |
|---------|-------------------------------------|--------|---------|
| 118.050 | ONE ONE EIGHT DECIMAL ZERO FIVE | 118.05 | 118.050 |
| 118.075 | ONE ONE EIGHT DECIMAL ZERO SEVEN | 118.07 | 118.075 |
| 118.100 | ONE ONE EIGHT DECIMAL ONE | 118.10 | 118.100 |

Note 2.— Caution must be exercised with respect to the indication of transmitting channels in VHF radiotelephony communications when five digits of the numerical designator are used in airspace where aircraft are also operated with channel separation capabilities of 8.33/25 kHz. On aircraft installations with a channel separation capability of 8.33 kHz and more, it is possible to select six digits on the radio management panel. It should therefore be ensured that the fifth and sixth digits are set to 25 kHz channels (see Note 1).

12. Test procedures

(5) The form of test transmissions shall be as follows:

- (a) the identification of the station being called;
- (b) the aircraft identification;
- (c) the words “RADIO CHECK”; and
- (d) the frequency being used.

(6) The reply to a test transmission shall be as follows:

- (a) the identification of the aircraft;
- (b) the identification of the aeronautical station replying; and
- (c) information regarding the readability of the aircraft transmission.

(7) The test transmission and reply thereto shall be recorded at the aeronautical station.

(8) When the tests are made, the following readability scale shall be used:

Readability Scale

1. *Unreadable*
2. *Readable now and then*
3. *Readable but with difficulty*
4. *Readable*
5. *Perfectly readable*

13. Exchange of communications

(1) Communications shall be concise and unambiguous, using standard phraseology whenever available.

(2) Abbreviated procedures shall only be used after initial contact has been established and where no confusion is likely to arise. Channel Transmitted as Radio management panel setting for communication equipment with

(3) Acknowledgement of receipt. The receiving operator shall make certain that the message has been received correctly before acknowledging receipt.

Note.— Acknowledgement of receipt is not to be confused with acknowledgement of intercept in radiotelephony network operations.

- (a) When transmitted by an aircraft station, the acknowledgement of receipt of a message shall comprise the call sign of that aircraft.
- (b) An aircraft station shall acknowledge receipt of important air traffic control messages or parts thereof by reading them back and terminating the readback by its radio call sign.

Note 1.— Air traffic control clearances, instructions and information requiring readback are specified in Civil Aviation ATS Regulations..

Note 2.— The following example illustrates the application of this procedure: (ATC clearance by network station to an aircraft)

Station: TWA NINE SIX THREE MADRID

Aircraft: MADRID TWA NINE SIX THREE

Station: TWA NINE SIX THREE MADRID — ATC
CLEARS TWA NINE
SIX THREE TO DESCEND TO NINE THOUSAND FEET

Aircraft (acknowledging) CLEARED TO DESCEND TO NINE THOUSAND
FEET — TWA NINE SIX THREE

Station (denoting accuracy of readback): MADRID

(c) When acknowledgement of receipt is transmitted by an aeronautical station:

(i) to an aircraft station: it shall comprise the call sign of the aircraft, followed if considered necessary by the call sign of the aeronautical station;

(ii) to another aeronautical station: it shall comprise the call sign of the aeronautical station that is acknowledging receipt.

(4) An aeronautical station shall acknowledge position reports and other flight progress reports by reading back the report and terminating the readback by its call sign, except that the readback procedure may be suspended temporarily whenever it will alleviate congestion on the communication channel.

(5) It is permissible for verification for the receiving station to read back the message as an additional acknowledgement of receipt. In such instances, the station to which the information is read back shall acknowledge the correctness of readback by transmitting its call sign.

(6) If both position report and other information — such as weather reports — are received in the same message, the information shall be acknowledged with the words such as “WEATHER RECEIVED” after the position report has been read back, except when intercept of the information is required by other network stations. Other messages shall be acknowledged, the aeronautical station transmitting its call sign only.

(7) End of conversation. A radiotelephone conversation shall be terminated by the receiving station using its own call sign.

14. Corrections and repetitions

(1) When an error has been made in transmission, the word “CORRECTION” shall be spoken, the last correct group or phrase repeated, and then the correct version transmitted.

(2) If a correction can best be made by repeating the entire message, the operator shall use the phrase

“CORRECTION, I SAY AGAIN” before transmitting the message a second time.

(3) When an operator transmitting a message considers that reception is likely to be difficult, he shall transmit the important elements of the message twice.

(4) If the receiving operator is in doubt as to the correctness of the message received, he shall request repetition either in full or in part

(5) If repetition of an entire message is required, the words “SAY AGAIN” shall be spoken. If repetition of a portion of a message is required, the operator shall state: “SAY AGAIN ALL BEFORE (first word satisfactorily received)”; or “SAY AGAIN (word before missing portion) TO...(word after missing portion)”; or “SAY AGAIN ALL AFTER...(last word satisfactorily received)”.

(6) Specific items shall be requested, as appropriate, such as “SAY AGAIN ALTIMETER”, “SAY AGAIN WIND”.

(7) If, in checking the correctness of a readback, an operator notices incorrect items, he shall transmit the words “NEGATIVE I SAY AGAIN” at the conclusion of the readback followed by the correct version of the items concerned.

15. Operations normal reports

(1) When “operations normal” reports are transmitted by aircraft, they shall consist of the prescribed call followed by the words “OPERATIONS NORMAL”.

16. Communications watch/hours of service

(1) During flight, aircraft stations shall maintain watch as required by the appropriate authority and shall not cease watch, except for reasons of safety, without informing the aeronautical station(s) concerned.

(2) Aircraft on long over-water flights, or on flights over designated areas over which the carriage of an emergency locator transmitter (ELT) is required, shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

(3) Aircraft shall continuously guard the VHF emergency frequency 121.5 MHz in areas or over routes where the possibility of interception of aircraft or other hazardous situations exist, and a requirement has been established by the appropriate authority.

(4) Aircraft on flights other than those specified in subparagraphs 2 and 3 shall guard the emergency frequency 121.5 MHz to the extent possible.

(5) The user of the air-to-air VHF communications channel shall ensure that adequate watch is maintained on designated ATS frequencies, the frequency of the aeronautical emergency channel, and any other mandatory watch frequencies.

(6) Aeronautical stations shall maintain watch as required by the appropriate authority.

Aeronautical stations shall maintain a continuous listening watch on VHF emergency channel 121.5 MHz during the hours of service of the units at which it is installed.

(7) When it is necessary for an aircraft station or aeronautical station to suspend operation for any reason, it shall, if possible, so inform other stations concerned, giving the time at which it is expected that operation will be resumed. When operation is resumed, other stations concerned shall be so informed.

(a) When it is necessary to suspend operation beyond the time specified in the original notice, a revised time of resumption of

operation shall, if possible, be transmitted at or near the time first specified.

(8) When two or more ATS frequencies are being used by a controller, consideration shall be given to providing facilities to allow ATS and aircraft transmissions on any of the frequencies to be simultaneously retransmitted on the other frequencies in use thus permitting aircraft stations within range to hear all transmissions to and from the controller.

17. Principles of network operation (HF communications)

(1) The aeronautical stations of a radiotelephony network shall assist each other in accordance with the following network principles, in order to provide the air-ground communication service required of the network by aircraft flying on the air routes for which the network is responsible.

(2) When the network comprises a large number of stations, network communications for flights on any individual route segment shall be provided by selected stations, termed “regular stations” for that segment.

Note 1.— The selection of stations to act as regular stations for a particular route segment will, where necessary, be undertaken by regional or local agreement, after consultation, if necessary, between the States responsible for the network.

Note 2.— In principle, the regular stations will be those serving the locations immediately concerned with flights on that route segment, i.e. points of take-off and landing, appropriate flight information centres or area control centres and, in some cases, additional suitably located stations required to complete the communication coverage or for intercept purposes.

Note 3.— In selecting the regular stations, account will be taken of the propagation characteristics of the frequencies used.

(3) In areas or on routes where radio conditions, length of flights or distance between aeronautical stations require additional measures to ensure continuity of air-ground communication throughout the route segment, the regular stations shall share between them a responsibility of primary guard whereby each station will provide the primary guard for that portion of the

flight during which the messages from the aircraft can be handled most effectively by that station.

(4) During its tenure of primary guard, each regular station shall, among other things:

- (a) be responsible for designating suitable primary and secondary frequencies for its communications with the aircraft;
- (b) receive all position reports and handle other messages from and to the aircraft essential to the safe conduct of the flight; and
- (c) be responsible for the action required in case of failure of communications.

(5) The transfer of primary guard from one station to the next will normally take place at the time of the traversing of flight information region or control area boundaries, this guard being provided at any time, as far as possible, by the station serving the flight information centre or area control centre in whose area the aircraft is flying. However, where communication conditions so demand, a station shall be required to retain primary guard beyond such geographical boundaries or release its guard before the aircraft reaches the boundary, if appreciable improvement in air-ground communication can be effected thereby.

18. Frequencies to be used

(1) Aircraft stations shall operate on the appropriate radio frequencies.

- (a) The air-ground control radio station shall designate the frequency(ies) to be used under normal conditions by aircraft stations operating under its control.
- (b) In network operation, the initial designation of primary and secondary frequencies shall be made by the network station with which the aircraft makes pre-flight check or its initial contact after take-off. This station shall also ensure that other network stations are advised, as required, of the frequency(ies) designated.

(2) An aeronautical station, when designating frequencies in accordance with subparagraphs (1)(a) or (1)(b), shall take into account the

appropriate propagation data and distance over which communications are required.

(3) If a frequency designated by an aeronautical station proves to be unsuitable, the aircraft station shall suggest an alternative frequency.

(4) When, notwithstanding regulation 55 (1), air-ground frequencies are used for the exchange between network stations of messages essential for coordination and cooperation between the stations, such communication shall, so far as possible, be effected over network frequencies not being used at that time for the bulk of the air-ground traffic. In all cases, the communication with aircraft stations shall take priority over the inter-ground station communications.

19. Establishment of communications

(1) Aircraft stations shall, if possible, communicate directly with the air-ground control radio station appropriate to the area in which the aircraft are flying. If unable to do so, aircraft stations shall use any relay means available and appropriate to transmit messages to the air-ground control radio station.

(2) When normal communications from an aeronautical station to an aircraft station cannot be established, the aeronautical station shall use any relay means available and appropriate to transmit messages to the aircraft station. If these efforts fail, the originator shall be advised in accordance with procedures prescribed by the appropriate authority.

(3) When, in network operation, communication between an aircraft station and a regular station has not been established after calls on the primary and secondary frequencies, aid shall be rendered by one of the other regular stations for that flight, either by calling the attention of the station first called or, in the case of a call made by an aircraft station, by answering the call and taking the traffic.

(4) Other stations of the network shall render assistance by taking similar action only if attempts to establish communications by the regular stations have proved unsuccessful.

(5) Subparagraphs (3) and (4) shall also be applied:

- (a) on request of the air traffic services unit concerned;
- (b) when an expected communication from an aircraft has not been received within a time period such that the occurrence of a communication failure is suspected.

Note.— A specific time period may be prescribed by the appropriate ATS authority.

20. Transfer of HF communications

(1) An aircraft station shall be advised by the appropriate aeronautical station to transfer from one radio frequency or network to another. In the absence of such advice, the aircraft station shall notify the appropriate aeronautical station before such transfer takes place.

(2) In the case of transfer from one network to another, the transfer shall preferably take place while the aircraft is in communication with a station operating in both networks to ensure continuity of communications. If, however, the change of network must take place concurrently with the transfer of communication to another network station, the transfer shall be coordinated by the two network stations prior to advising or authorizing the frequency change. The aircraft shall also be advised of the primary and secondary frequencies to be used after the transfer.

(3) An aircraft station which has transferred communications watch from one radio frequency to another shall, when so required by the appropriate ATS authority, inform the aeronautical station concerned that communications watch has been established on the new frequency.

(4) When entering a network after take-off, an aircraft station shall transmit its take-off time or time over the last check-point, to the appropriate regular station.

(5) When entering a new network, an aircraft station shall transmit the time over the last checkpoint, or of its last reported position, to the appropriate regular station.

(6) Before leaving the network, an aircraft station shall in all cases advise the appropriate regular station of its intention to do so by transmitting one of the following phrases, as appropriate:

(a) *when transferring to a pilot-to-controller channel: Aircraft: CHANGING TO . . . (air traffic services unit concerned)*

(b) *after landing: Aircraft: LANDED . . . (location) . . . (time)*

21. Transfer of VHF communications

(1) An aircraft shall be advised by the appropriate aeronautical station to transfer from one radio frequency to another in accordance with agreed procedures. In the absence of such advice, the aircraft station shall notify the appropriate aeronautical station before such a transfer takes place.

(2) When establishing initial contact on, or when leaving, a VHF frequency, an aircraft station shall transmit such information as may be prescribed by the appropriate authority.

22. Voice communications failure

(1) When an aircraft station fails to establish contact with the appropriate aeronautical station on the designated channel, it shall attempt to establish contact on the previous channel used and, if not successful, on another channel appropriate to the route. If these attempts fail, the aircraft station shall attempt to establish communication with the appropriate aeronautical station, other aeronautical stations or other aircraft using all available means and advise the aeronautical station that contact on the assigned channel could not be established. In addition, an aircraft operating within a network shall monitor the appropriate VHF channel for calls from nearby aircraft.

(2) If the attempts specified under subparagraph (1) fail, the aircraft station shall transmit its message twice on the designated channel(s), preceded by the phrase “TRANSMITTING BLIND” and, if necessary, include the addressee(s) for which the message is intended.

(3) In network operation, a message which is transmitted blind shall be transmitted twice on both primary and secondary channels. Before changing channel, the aircraft station shall announce the channel to which it is changing.

(4) When an aircraft station is unable to establish communication due to receiver failure, it shall transmit reports at the scheduled times, or positions, on the channel in use, preceded by the phrase “TRANSMITTING BLIND DUE TO RECEIVER FAILURE”. The aircraft station shall transmit the intended message, following this by a complete repetition. During this procedure, the aircraft shall also advise the time of its next intended transmission.

(5) An aircraft which is provided with air traffic control or advisory service shall, in addition to complying with subparagraph (4), transmit information regarding the intention of the pilot-in-command with respect to the continuation of the flight of the aircraft.

(6) When an aircraft is unable to establish communication due to airborne equipment failure it shall, when so equipped, select the appropriate SSR code to indicate radio failure.

(7) When an aeronautical station has been unable to establish contact with an aircraft station after calls on the frequencies on which the aircraft is believed to be listening, it shall—

- (a) request other aeronautical stations to render assistance by calling the aircraft and relaying traffic, if necessary; and
- (b) request aircraft on the route to attempt to establish communication with the aircraft and relay traffic, if necessary.

(1) The provisions of sub-paragraph (7) shall also be applied—

- (a) on request of the air traffic services unit concerned; or
- (b) when an expected communication from an aircraft has not been received within a time period such that the occurrence of a communication failure is suspected.

(2) If the attempts specified in subparagraph (7) fail, the aeronautical station shall transmit messages addressed to the aircraft, other than messages containing air traffic control clearances, by blind transmission on the frequency(ies) on which the aircraft is believed to be listening.

(3) Blind transmission of air traffic control clearances shall not be made to aircraft, except at the specific request of the originator.

(4) Notification of communications failure. The air-ground control radio station shall notify the appropriate air traffic services unit and the aircraft operating agency, as soon as possible, of any failure in air-ground communication.

23. HF message handling

(1) When operating within a network, an aircraft station shall, in principle, whenever communications conditions so permit, transmit its messages to the stations of the network from which they can be most readily delivered to their ultimate destinations. In particular, aircraft reports required by air traffic services shall be transmitted to the network station serving the flight information centre or area control centre in whose area the aircraft is flying. Conversely, messages to aircraft in flight shall, whenever possible, be transmitted directly to the aircraft by the network station serving the location of the originator.

Note.— Exceptionally, an aircraft may need to communicate with an aeronautical station outside the network appropriate to its particular route segment. This is permissible, provided it can be done without interrupting the continuous watch with the communication network appropriate to the route segment, when such watch is required by the appropriate ATS authority, and provided it does not cause undue interference with the operation of other aeronautical stations.

(2) Messages passed from an aircraft to a network station shall, whenever possible, be intercepted and acknowledged by other stations of the network, which serve locations where the information is also required.

Note 1.— Determination of the arrangements for dissemination of air-ground messages without address will be a matter for multilateral or local agreement.

Note 2.— In principle, the number of stations required to intercept are to be kept to a minimum consistent with the operational requirement.

- (a) Acknowledgement of intercept shall be made immediately after the acknowledgement of receipt by the station to which the message was passed.

(b) Acknowledgement of an intercept message shall be made by transmitting the radio call sign of the station having intercepted the message, followed by the word ROGER, if desired, and the call sign of the station having transmitted the message.

(3) In the absence of acknowledgement of intercept within one minute, the station accepting the message from the aircraft shall forward it, normally over the aeronautical fixed service, to the station(s) which have failed to acknowledge intercept.

(4) If, in abnormal circumstances, forwarding is necessary using the air-ground channels, the provisions of subparagraph 18 (4) shall be observed.

(5) When such forwarding is done over the AFTN, the messages shall be addressed to the network station(s) concerned.

(6) The station(s) to which the messages have been forwarded shall carry out local distribution of them in the same way as if they had been received directly from the aircraft over the air-ground channel.

(7) The aeronautical station receiving an air report or a message containing meteorological information transmitted by an aircraft in flight shall forward the message without delay—

- (a) to the air traffic services unit and meteorological offices associated with the station; and
- (b) to the aircraft operating agency concerned or its representative when that agency has made a specific request to receive such messages.

(8) The provisions of subparagraph (2) shall also be applied, if practicable, in non-network operation.

(9) When a message addressed to an aircraft in flight is received by the aeronautical station included in the address, and when that station is not able to establish communication with the aircraft to which the message is addressed, the message shall be forwarded to those aeronautical stations on the route which may be able to establish communication with the aircraft.

(10) If the aeronautical station to which the message is addressed is unable to dispose of the message in accordance with subparagraph (9), the station of origin shall be advised.

(11) The aeronautical station forwarding the message shall amend the address, by substituting for its own location indicator the location indicator of the aeronautical station to which the message is being forwarded.

24. Transmission of ATS messages to aircraft

(1) If it is not possible to deliver an ATS message to the aircraft within the time specified by ATS, the aeronautical station shall notify the originator. Thereafter, it shall take no further action with respect to this message unless specifically instructed by ATS.

(2) If delivery of an ATS message is uncertain because of inability to secure an acknowledgement, the aeronautical station shall assume that the message has not been received by the aircraft and shall advise the originator immediately that, although the message has been transmitted, it has not been acknowledged.

(3) The aeronautical station, having received the message from ATS, shall not delegate to another station the responsibility for delivery of the message to the aircraft. However, in case of communication difficulties, other stations shall assist, when requested, in relaying the message to the aircraft. In this case, the station having received the message from ATS shall obtain without delay definite assurance that the aircraft has correctly acknowledged the message.

25. SELCAL procedures

(1) With the selective calling system known as SELCAL, the voice calling is replaced by the transmission of coded tones to the aircraft over the radiotelephony channels. A single selective call consists of a combination of four pre-selected audio tones whose transmission requires approximately 2 seconds. The tones are generated in the aeronautical station coder and are received by a decoder connected to the audio output of the airborne receiver. Receipt of the assigned tone code (SELCAL code) activates a cockpit call system in the form of light or chime signals.

(2) SELCAL shall be utilised by suitably equipped stations for ground- to-air selective calling on the en-route HF and VHF radio channels.

(3) On aircraft equipped with SELCAL, the pilot is still able to keep a conventional listening watch if required.

26. Notification to aeronautical stations of aircraft SELCAL codes

(1) It shall be the responsibility of the aircraft operating agency and the aircraft to ensure that all aeronautical stations, with which the aircraft would normally communicate during a particular flight, know the SELCAL code associated with its radiotelephony call sign.

(2) When practicable, the aircraft operating agency shall disseminate to all aeronautical stations concerned, at regular intervals, a list of SELCAL codes assigned to its aircraft or flights.

(3) The aircraft shall—

- a) include the SELCAL code in the flight plan submitted to the appropriate air traffic services unit; and
- b) ensure that the HF aeronautical station has the correct SELCAL code information by establishing communications temporarily with the HF aeronautical station while still within VHF coverage.

27. SELCAL pre-flight check

(1) The aircraft station shall contact the appropriate aeronautical station and request a pre-flight SELCAL check and, if necessary, give its SELCAL code.

(2) When primary and secondary frequencies are assigned, a SELCAL check shall normally be made first on the secondary frequency and then on the primary frequency. The aircraft station shall then be ready for continued communication on the primary frequency.

(3) If the pre-flight check reveal that either the ground or airborne SELCAL installation is inoperative, the aircraft shall maintain a continuous listening watch on its subsequent flight until SELCAL again becomes available.

28. Establishment of communication with SELCAL

(1) When an aeronautical station initiates a call by SELCAL, the aircraft shall reply with its radio call sign, followed by the phrase “GO AHEAD”.

29. SELCAL enroute procedures

(1) Aircraft stations shall ensure that the appropriate aeronautical station(s) are aware that SELCAL watch is being established or maintained.

(2) When so prescribed on the basis of regional air navigation agreements, calls for scheduled reports from aircraft shall be initiated by an aeronautical station by means of SELCAL.

(3) Once SELCAL watch has been established by a particular aircraft station, aeronautical stations shall employ SELCAL whenever they require to call aircraft.

(4) In the event the SELCAL signal remains unanswered after two calls on the primary frequency and two calls on the secondary frequency, the aeronautical station shall revert to voice calling.

(5) Stations in a network shall keep each other immediately advised when malfunctioning occurs in a SELCAL installation on the ground or in the air. Likewise, the aircraft shall ensure that the aeronautical stations concerned with its flight are immediately made aware of any malfunctioning of its SELCAL installation, and that voice calling is necessary.

(6) All stations shall be advised when the SELCAL installation is again functioning normally.

30. SELCAL code assignment to aircraft

(1) In principle, the SELCAL code in the aircraft shall be associated with the radiotelephony call sign, i.e. where the flight number (service number) is employed in the radio call sign, the SELCAL code in the aircraft shall be listed against the flight number. In all other cases, the SELCAL code in the aircraft shall be listed against the aircraft registration.

SCHEDULE 7

Regulation 65

DISTRESS AND URGENCY RADIOTELEPHONY COMMUNICATION PROCEDURES

1. General

(1) Distress and urgency traffic shall comprise all radiotelephony messages relative to the distress and urgency conditions respectively. Distress and urgency conditions are defined as:

- (a) *Distress*: a condition of being threatened by serious or imminent danger and of requiring immediate assistance.
- (b) *Urgency*: a condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, but which does not require immediate assistance.

(2) The radiotelephony distress signal MAYDAY and the radiotelephony urgency signal PAN PAN shall be used at the commencement of the first distress and urgency communication respectively. At the commencement of any subsequent communication in distress and urgency traffic, it shall be permissible to use the radiotelephony distress and urgency signals.

(3) The originator of messages addressed to an aircraft in distress or urgency condition shall restrict to the minimum the number and volume and content of such messages as required by the condition.

(4) If no acknowledgement of the distress or urgency message is made by the station addressed by the aircraft, other stations shall render assistance, as prescribed in paragraphs 3 and 8 respectively.

(5) Distress and urgency traffic shall normally be maintained on the frequency on which such traffic was initiated until it is considered that better assistance can be provided by transferring that traffic to another frequency.

(6) In cases of distress and urgency communications, in general, the transmissions by radiotelephony shall be made slowly and distinctly, each word being clearly pronounced to facilitate transcription.

2. Radiotelephony distress communications

In addition to being preceded by the radiotelephony distress signal MAYDAY, preferably spoken three times, the distress message to be sent by an aircraft in distress shall—

- (a) be on the air-ground frequency in use at the time; and
- (b) consist of as many as possible of the following elements spoken distinctly and, if possible, in the following order—
 - (i) name of the station addressed (time and circumstances permitting);
 - (ii) the identification of the aircraft;
 - (iii) the nature of the distress condition;
 - (iv) intention of the person in command; and
 - (v) present position, level (i.e. flight level, altitude, etc., as appropriate) and heading.

3. Action by the station addressed or first station acknowledging the distress message

The station addressed by aircraft in distress, or first station acknowledging the distress message, shall—

- (a) immediately acknowledge the distress message;
- (b) take control of the communications or specifically and clearly transfer that responsibility, advising the aircraft if a transfer is made;
- (c) take immediate action to ensure that all necessary information is made available, as soon as possible, to—
 - (i) the ATS unit concerned; and
 - (ii) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements; and

Note.— The requirement to inform the aircraft operating agency concerned does not have priority over any other action which involves the safety of the flight in distress, or of any other flight in the area, or which might affect the progress of expected flights in the area.

- (d) warn other stations, as appropriate, in order to prevent the transfer of traffic to the frequency of the distress communication.

4. Imposition of silence after distress communication

(1) The station in distress, or the station in control of distress traffic, shall be permitted to impose silence, either on all stations of the mobile service in the area or on any station which interferes with the distress traffic. It shall address these instructions “to all stations”, or to one station only, according to circumstances. In either case, it shall use—

- (a) STOP TRANSMITTING; and
- (b) the radiotelephony distress signal MAYDAY.

(2) The use of the signals specified in subparagraph (10) shall be reserved for the aircraft station in distress and for the station controlling the distress traffic.

5. Action by all other stations after a distress communication

(1) The distress communications have absolute priority over all other communications, and a station aware of them shall not transmit on the frequency concerned, unless—

- (a) the distress is cancelled or the distress traffic is terminated;
- (b) all distress traffic has been transferred to other frequencies;
- (c) the station controlling communications gives permission; or
- (d) it has itself to render assistance.

(2) Any station which has knowledge of distress traffic, and which cannot itself assist the station in distress, shall nevertheless continue listening to such traffic until it is evident that assistance is being provided.

6. Termination of distress communications and of silence

(1) When an aircraft is no longer in distress, it shall transmit a message cancelling the distress condition.

(2) When the station which has controlled the distress communication traffic becomes aware that the distress condition is ended, it shall take immediate action to ensure that this information is made available, as soon as possible, to—

- (a) the ATS unit concerned; or
- (b) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements.

(3) The distress communication and silence conditions shall be terminated by transmitting a message, including the words “DISTRESS TRAFFIC ENDED”, on the frequency or frequencies being used for the distress traffic. This message shall be originated only by the station controlling the communications when, after the reception of the message prescribed in sub-paragraph (7), it is authorized to do so by the appropriate authority.

7. Radiotelephony urgency communications

(1) Action by the aircraft reporting an urgency condition except as indicated in paragraph 11 shall be as mentioned in subparagraph (2).

(2) In addition to being preceded by the radiotelephony urgency signal PAN PAN preferably spoken three times and each word of the group pronounced as the French word “panne”, the urgency message to be sent by an aircraft reporting an urgency condition shall—

- (a) be on the air-ground frequency in use at the time; and
- (b) consist of as many as required of the following elements spoken distinctly and, if possible, in the following order:
 - (i) the name of the station addressed;
 - (ii) the identification of the aircraft;
 - (iii) the nature of the urgency condition;
 - (iv) the intention of the person in command;
 - (v) present position, level (i.e. flight level, altitude, etc., as appropriate) and heading; and
 - (vi) any other useful information.

8. Action by station addressed or first station acknowledging urgency message

The station addressed by an aircraft reporting an urgency condition, or first station acknowledging the urgency message, shall—

- (a) acknowledge the urgency message;
- (b) take immediate action to ensure that all necessary information is made available, as soon as possible, to—
 - (ii) the ATS unit concerned; or
 - (iii) the aircraft operating agency concerned, or its representative, in accordance with pre-established arrangements; and
- (c) if necessary, exercise control of communications.

9. Action by all other stations

The urgency communications have priority over all other communications, except distress, and all stations shall take care not to interfere with the transmission of urgency traffic.

10. Action by an aircraft used for medical transports

(1) The use of the signal described in subparagraph (2) shall indicate that the message which follows concerns a protected medical transports pursuant to the 1949 Geneva Conventions and Additional Protocols.

(2) For the purpose of announcing and identifying aircraft used for medical transports, a transmission of the radiotelephony urgency signal PAN PAN, preferably spoken three times, and each word of the group pronounced as the French word “panne”, shall be followed by the radiotelephony signal for medical transports MAY-DEE-CAL, pronounced as in the French “médical”. The use of the signals described above indicates that the message which follows concerns a protected medical transport. The message shall convey the following data—

- (a) the call sign or other recognised means of identification of the medical transports;
- (b) position of the medical transports;
- (c) number and type of medical transports;
- (d) intended route;
- (e) estimated time en-route and of departure and arrival, as appropriate; and

- (f) any other information such as flight altitude, radio frequencies guarded, languages used, and secondary surveillance radar modes and codes.

11. Action by station addressed or by other stations receiving a medical message

The provisions of paragraphs 8 and 9 shall apply as appropriate to stations receiving a medical message

SCHEDULE 8

Regulation 71

RADIOTELEPHONE BROADCAST PROCEDURES

1. Broadcast technique

(1) Transmissions by radiotelephone shall be as natural, short and concise as practicable consistent with clarity.

(2) Rate of speech on radiotelephone broadcasts shall not exceed 100 words per minute.

2. Preamble of general call

The preamble of each radiotelephone broadcast shall consist of the general call, station name, and optionally the time of broadcast (UTC).

Note.— The following example illustrates the application of this procedure:

| | |
|----------------------------|---------------------------|
| <i>(general call)</i> | ALL STATIONS |
| <i>(the words)</i> | THIS IS) THIS IS |
| <i>(station name)</i> | NEW YORK RADIO |
| <i>(time of broadcast)</i> | TIME, ZERO ZERO FOUR FIVE |

SCHEDULE 9

Regulations 73 and 75

AERONAUTICAL MOBILE SERVICE — DATA LINK COMMUNICATIONS

1. General

While the provisions of this Schedule are based primarily on the use of controller-pilot data link communications (CPDLC), the provisions of paragraph 2 would apply to other data link applications, where applicable, including Data link—flight information services (e.g. D-ATIS, DVOLMET, etc.).

For the purposes of these provisions, the communication procedures applicable to the aeronautical mobile service, as appropriate, also apply to the aeronautical mobile satellite service.

2. Composition of data link messages

(1) The text of messages shall be composed in standard message format (e.g. CPDLC message set), in plain language or in abbreviations and codes, as prescribed in regulation 33. Plain language shall be avoided when the length of the text can be reduced by using appropriate abbreviations and codes. Nonessential words and phrases, such as expressions of politeness, shall not be used.

(2) The following characters are allowed in the composition of messages—

Letters: ABCDEFGHIJKLMNOPQRSTUVWXYZ (upper case only);

Figures: 1 2 3 4 5 6 7 8 9 0;

Other signs:

- (hyphen)

? (question mark)

: (colon)

((open bracket)

) (close bracket)

- . (full stop, period, or decimal point)
- , (comma)
- ' (apostrophe)
- = (double hyphen or equal sign)
- / (oblique)
- + (plus sign)

and the space character.

Characters other than those listed above shall not be used in messages.

(3) Roman numerals shall not be employed. If the originator of a message wishes the addressee to be informed that Roman figures are intended, the Arabic figure or figures shall be written and preceded by the word ROMAN.

(4) Display of data link messages

(a) Ground and airborne systems shall allow for messages to be appropriately displayed, printed when required, and stored in a manner that permits timely and convenient retrieval should such action be necessary.

(b) Whenever textual presentation is required, the English language shall be displayed as a minimum.

3. CPDLC procedures

(1) In all communications the highest standard of discipline shall be observed at all times.

(a) Consequences of human performance, which could affect the accurate reception and comprehension of messages, shall be taken into consideration when composing a message.

Note.— Guidance material on human performance can be found in the Human Factors Training Manual (Doc 9683) and Human Factors Guidelines for Air Traffic Management (ATM) Systems (Doc 9758).

(2) Ground and airborne systems shall provide controllers and pilots with the capability to review and validate any operational messages they send.

(3) Ground and airborne systems shall provide controllers and pilots with the capability to review, validate and when applicable, acknowledge any operational messages they receive.

(4) The controller shall be provided with the capability to respond to messages, including emergencies, to issue clearances, instructions and advisories, and to request and provide information, as appropriate.

(5) The pilot shall be provided with the capability to respond to messages, to request clearances and information, to report information, and to declare or cancel an emergency.

(6) The pilot and the controller shall be provided with the capability to exchange messages which do not conform to defined formats (i.e. free text messages).

(7) Unless specified by the appropriate ATS authority, voice read-back of CPDLC messages shall not be required.

4. Establishment of CPDLC

(1) The controller and the pilot shall be informed when CPDLC has been successfully established.

(2) CPDLC shall be established in sufficient time to ensure that the aircraft is communicating with the appropriate ATC unit.

(3) The controller and pilot shall be informed when CPDLC is available for operational use, at initial establishment, as well as on resumption of CPDLC after a failure.

(4) The pilot shall be able to identify the air traffic unit providing the air traffic control service at any time while the service is being provided.

(5) When the airborne system detects that CPDLC is available for operational use, it shall send the CPDLC downlink message element

CURRENT DATA AUTHORITY.

5. Airborne-initiated CPDLC

(1) When an ATC unit receives an unexpected request for CPDLC from an aircraft, the circumstances leading to the request shall be obtained from the aircraft to determine further action.

(2) When the ATC unit rejects a request for CPDLC, it shall provide the pilot with the reason for the rejection using an appropriate CPDLC message.

6. ATC unit-initiated CPDLC

(1) An ATC unit shall only establish CPDLC with an aircraft if the aircraft has no CPDLC link established, or when authorised by the ATC unit currently having CPDLC established with the aircraft.

(2) When a request for CPDLC is rejected by an aircraft, the reason for the rejection shall be provided using CPDLC downlink message element NOT CURRENT DATA AUTHORITY or message element NOT AUTHORISED NEXT DATA AUTHORITY, as appropriate. Local procedures shall dictate whether the reason for rejection is presented to the controller. No other reasons for airborne rejection of ATC unit initiation of CPDLC shall be permitted.

7. Exchange of operational CPDLC messages

(1) Controllers and pilots shall construct CPDLC messages using the defined message set, a free text message or a combination of both.

(a) When CPDLC is being used, and the intent of the message is included in the CPDLC message set contained in the PANS-ATM, Appendix 5, the associated message shall be used.

(b) Except as provided by paragraph 11 when a controller or pilot communicates via CPDLC, the response shall be via CPDLC. When a controller or pilot communicates via voice, the response shall be via voice.

(c) Whenever a correction to a message sent via CPDLC is deemed necessary or the contents of a message needs to be clarified, the controller or pilot shall use the most appropriate means available for issuing the correct details or for providing clarification.

- (i) When voice communications are used to correct a CPDLC message for which no operational response has yet been received, the controller's or pilot's transmission shall be prefaced by the phrase: "DISREGARD CPDLC (message type) MESSAGE, BREAK" — followed by the correct clearance, instruction, information or request.
- (ii) When referring to and identifying the CPDLC message to be disregarded, caution shall be exercised in its phrasing so as to avoid any ambiguity with the issuance of the accompanying corrected clearance, instruction, information or request.

Note.— For example, if SAS445, maintaining FL290, had been instructed via CPDLC to climb to FL350, and the controller needs to correct the clearance utilizing voice communications, the following phrase might be used:

SAS445 DISREGARD CPDLC CLIMB CLEARANCE MESSAGE,
BREAK, CLIMB TO FL310.

- (iii) If a CPDLC message that requires an operational response is subsequently negotiated via voice, an appropriate CPDLC message closure response shall be sent to ensure proper synchronisation of the CPDLC dialogue. This could be achieved either by explicitly instructing the recipient of the message via voice to close the dialogue or by allowing the system to automatically close the dialogue.
- (2) The composition of a CPDLC message shall not exceed five message elements, only two of which may contain the route clearance variable.
- (a) The use of long messages or messages with multiple clearance elements, multiple clearance request elements or messages with a combination of clearances and information shall be avoided where possible.

Note.— Guidance material on the development of local operating procedures and CPDLC good operating technique can be found in the Human Factors Guidelines for Air Traffic Management (ATM) Systems (Doc 9758).

(3) CPDLC ground systems and airborne systems shall be capable of using the CPDLC message urgency and alert attributes to alter presentations in order to draw attention to higher priority messages.

Note.— Message attributes dictate certain message handling requirements for the CPDLC user receiving a message. Each CPDLC message has three attributes: urgency, alert and response attributes. When a message contains multiple message elements, the highest precedence message element attribute type becomes the attribute type for the entire message.

- (a) The alert attribute shall delineate the type of alerting required upon message receipt. Alert types are presented in Table 9-1.

Table 9-1 Alert Attribute (uplink and downlink)

| Type | Description | Precedence |
|------|----------------------|------------|
| H | High | 1 |
| M | Medium | 2 |
| L | Low | 3 |
| N | No alerting required | 4 |

- (b) The response attribute shall delineate valid responses for a given message element. Response types are presented in Table 9-2 for uplink messages and Table 9-3 for downlink messages.
 - (i) When a multi-element message requires a response, and the response is in the form of a single message element, the response shall apply to all message elements.

Note.— For example, a multi-element message containing

CLIMB TO FL310 MAINTAIN MACH.84, a WILCO response applies to, and indicates compliance with, both elements of the message.

- (ii) When a single message element clearance or any part of a multi-element clearance message cannot be complied with, the pilot shall send an UNABLE response for the whole message.

- (iii) The controller shall respond with an UNABLE message that applies to all elements of the request when no element(s) of a single or multi-element clearance request can be approved. The current clearance(s) shall not be restated.
- (iv) When a multi-element clearance request can only be partially accommodated, the controller shall respond with an UNABLE message applying to all the message elements of the request and, if appropriate, include a reason and/or information on when a clearance may be expected.

Table 9-2. Response Attribute (uplink)

| Type | Response required | Valid responses | Precedence |
|------|---|---|------------|
| W/U | Yes | WILCO, UNABLE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORISED NEXT DATA AUTHORITY, LOGICALACKNOWLEDGEMENT (only if required), ERROR | 1 |
| A/N | Yes | AFFIRM, NEGATIVE, STANDBY, NOT CURRENT DATAAUTHORITY, NOT AUTHORISED NEXT DATAAUTHORITY, LOGICALACKNOWLEDGEMENT (only if required), ERROR | 2 |
| R | Yes | ROGER, UNABLE, STANDBY, NOT CURRENT DATAAUTHORITY, NOT AUTHORISED NEXT DATAAUTHORITY, LOGICALACKNOWLEDGEMENT (only if required), ERROR | 3 |
| Y | Yes | Any CPDLC downlink message, LOGICALACKNOWLEDGEMENT (only if required) | 4 |
| N | No, unless logical acknowledgement required | LOGICALACKNOWLEDGEMENT (only if required), NOT CURRENT DATA AUTHORITY, NOT AUTHORISED NEXT DATAAUTHORITY, ERROR | 5 |

Table 9-3. Response Attribute (downlink)

| Type | Response required | Valid responses | Precedence |
|------|--|---|------------|
| Y | Yes | Any CPDLC uplink message, LOGICAL ACKNOWLEDGEMENT (only if required) | 1 |
| N | No unless logical acknowledgement required | LOGICAL ACKNOWLEDGEMENT (only if required), MESSAGE NOT SUPPORTED BY THIS ATC UNIT, ERROR | 2 |

Note.— A separate CPDLC message (or messages) may subsequently be transmitted to respond to those elements that can be accommodated.

- (v) When all elements of a single or multi-element clearance request can be accommodated, the controller shall respond with clearances corresponding to each element of the request. This response shall be a single uplink message.

Note.— For example, while messages containing multi-element clearance requests are to be avoided, a multi-element downlink message containing the indicated message elements:

REQUEST CLEARANCE YQM YYG YYT YQX
TRACK X EINN EDDF
REQUEST CLIMB TO FL350
REQUEST MACH 0.84

could be responded to with
CLEARED YQM YYG YYT YQX TRACK X EINN
EDDF CLIMB TO FL350

REPORT MAINTAINING CROSS YYG
AT OR AFTER 1150
NO SPEED RESTRICTION.

- (vi) When a CPDLC message contains more than one message element and the response attribute for the message is Y, when utilized, the single response message shall contain the corresponding number of replies in the same order.

Note.— For example, a multi-element uplink message containing —

CONFIRM SQUAWK
WHEN CAN YOU ACCEPT FL410
could be responded to with

SQUAWKING 5525
WE CAN ACCEPT FL410 AT 1636Z

(4) When a ground or airborne system generates the CPDLC message ERROR, the reason for the error shall be included in the message.

(5) The appropriate ATS authority shall select those message elements contained in PANS-ATM, Appendix 5 that support operations in their airspace. Should an ATS authority choose to select a subset of the message elements, and a received message does not belong to this subset, the ATC unit shall respond by up linking the message element **MESSAGE NOT SUPPORTED BY THIS ATC UNIT**.

- (a) Only the uplink messages appropriate to a particular control sector's operations shall be provided to the controller.
- (b) When considered necessary by the appropriate ATS authority, additional pre-formatted free text messages shall be made available to the controller for those occasions where the CPDLC message set contained in the PANS-ATM does not provide for specific requirements. In such cases, a list of pre-formatted free text messages shall be established by the appropriate ATS authority, in consultation with operators and other ATS authorities that may be concerned.
- (c) Information concerning CPDLC message element subsets utilised and, if applicable, any additional preformatted free text messages, shall be published in aeronautical information publications.

8. Transfer of CPDLC

(1) When CPDLC is transferred, the transfer of voice communications and CPDLC shall commence concurrently.

(2) When an aircraft is transferred from an ATC unit where CPDLC is available to an ATC unit where CPDLC is not available, CPDLC termination shall commence concurrent with the transfer of voice communications.

(3) When a transfer of CPDLC results in a change of data authority, and there are still messages for which the closure response has not been received (i.e. messages outstanding), the controller transferring the CPDLC shall be informed.

(4) If the controller needs to transfer the aircraft without replying to any downlink message(s) outstanding, the system shall have the capability to automatically send the appropriate closure response message(s). In such cases, the contents of any automatically sent closure response message(s) shall be promulgated in local instructions.

(5) When the controller decides to transfer the aircraft without receiving pilot responses to any uplink message(s) outstanding, the ground system shall have the capability to automatically end the dialogue for each message prior to the transfer.

(6) The controller shall revert to voice communications to clarify any ambiguity associated with the message(s) outstanding.

(7) When a transfer of CPDLC does not result in a change of data authority, and there are still messages outstanding, these messages shall either be forwarded to the appropriate controller or shall be closed in accordance with local instructions and, if necessary, letters of agreement.

9. Display of CPDLC messages

ATC units utilising a CPDLC message contained in the PANS-ATM shall display the associated text pertaining to that message as presented in the PANS-ATM, Appendix 5.

10. Free text messages

The use of free text messages by controllers or pilots, other than pre-formatted free text messages referred to in paragraph 7 (5) (b), shall be avoided.

11. Emergencies, hazards and equipment failure procedures

(1) When a CPDLC emergency message is received, the controller shall acknowledge receipt of the message by the most efficient means available.

(2) When responding via CPDLC to a report indicating unlawful interference, uplink message ROGER 7500 shall be used.

(3) When responding via CPDLC to all other emergency or urgency messages, uplink message ROGER shall be used.

(4) When a CPDLC message requires a logical acknowledgement and/or an operational response, and such a response is not received, the pilot or controller, as appropriate, shall be alerted.

12. Failure of CPDLC

(1) A CPDLC failure shall be detected in a timely manner.

(2) The controller and pilot shall be alerted to a failure of CPDLC as soon as a failure has been detected.

(3) When a controller or pilot is alerted that CPDLC has failed, and the controller or pilot needs to communicate prior to CPDLC being restored, the controller or pilot shall revert to voice, if possible, and preface the information with the phrase:

13. CPDLC FAILURE

(1) Controllers having a requirement to transmit information concerning a complete CPDLC ground system failure to all stations likely to intercept shall preface such a transmission by the general call ALL STATIONS CPDLC FAILURE, followed by the identification of the calling station.

(2) When CPDLC fails and communications revert to voice, all CPDLC messages outstanding shall be considered not delivered and the entire dialogue involving the messages outstanding shall be recommenced by voice.

(3) When CPDLC fails but is restored prior to a need to revert to voice communications, all messages outstanding shall be considered not delivered and the entire dialogue involving the messages outstanding shall be recommenced via CPDLC.

14. Intentional shutdown of CPDLC

(1) When a system shutdown of the communications network or the CPDLC ground system is planned, a NOTAM shall be published to inform all affected parties of the shutdown period and if necessary, the details of the voice communication frequencies to be used.

(2) Aircraft currently in communication with the ATC unit shall be informed by voice or CPDLC of any imminent loss of CPDLC service.

(3) The controller and pilot shall be provided with the capability to abort CPDLC.

15. Failure of a single CPDLC message

When a controller or pilot is alerted that a single CPDLC message has failed, the controller or pilot shall take one of the following actions, as appropriate:

- (a) via voice, confirm the actions that will be undertaken with respect to the related dialogue, prefacing the information with the phrase: CPDLC MESSAGE FAILURE;
- (b) via CPDLC, reissue the CPDLC message that failed.

16. Discontinuation of use of CPDLC pilot requests

(1) When a controller requires all stations or a specific flight to avoid sending CPDLC requests for a limited period of time, the following phrase shall be used: ((call sign) or ALL STATIONS) STOP SENDING CPDLCREQUESTS [UNTIL ADVISED] [(reason)]

(2) The resumption of the normal use of CPDLC shall be advised by using the following phrase:

((call sign) or ALL STATIONS) RESUME NORMAL CPDLC OPERATIONS

(3) Where the testing of CPDLC with an aircraft could affect the air traffic services being provided to the aircraft, coordination shall be effected prior to such testing.

Cross References

Civil Aviation (Aeronautical Information Services) Regulations, 2022
S.I. No. 71 of 2022.

Civil Aviation (Certification of Air Navigation Services) Regulations,
2022 S.I. No. 74 of 2022.

GEN. EDWARD KATUMBA-WAMALA (MP)
Minister of Works and Transport.

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 75

**THE CIVIL AVIATION (AIRCRAFT INSTRUMENTS AND
EQUIPMENT) REGULATIONS, 2022**

ARRANGEMENT OF REGULATIONS

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STATUTORY INSTRUMENTS

2022 No. 75

The Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022 *(Under section 61 of the Civil Aviation Authority Act, Cap. 354)*

IN EXERCISE of the powers conferred upon the Minister responsible for Civil Aviation by section 61 of the Civil Aviation Authority Act, Cap. 354 and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made, this 27th day of June, 2022.

PART I— PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022.

2. Interpretation

In these Regulations, unless the context otherwise requires—

“aerial work” means an aircraft operation in which an aircraft is used for specialised services such as agriculture, construction, photography, surveying, observation, patrol, aerial, fire fighting, advertisement, search and rescue;

“aerodrome” means a defined area on land or water, including any buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;

“aeroplane” means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight;

“agreement summary” means, when an aircraft is operating under an Article 83 bis agreement between the State of

Registry and another State, the document transmitted with the Article 83 bis Agreement registered with the ICAO Council that identifies succinctly and clearly which functions and duties are transferred by the State of Registry to that other State;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air, other than the reactions of the air against the earth’s surface;

“aircraft operating manual” means a manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft and the aircraft operating manual is part of the operations manual;

“air operator certificate (AOC)” means a certificate authorizing an operator to carry out specified commercial air transport operations;

“air traffic service or ATS” includes flight information service, alerting service, air traffic advisory service, air traffic control service including area control service, approach control service or aerodrome control service;

“altimetry system error or ASE” means the difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting and the pressure altitude corresponding to the undisturbed ambient pressure;

“alternate aerodrome” means an aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities

are available, where aircraft performance requirements can be met and which is operational at the expected time of use; and alternate aerodromes include the following-

- (a) take-off alternate which is an alternate aerodrome at which an aircraft would be able to land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure;
- (b) en-route alternate which is an alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route; and
- (c) destination alternate which is an alternate aerodrome at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing;

“alternate heliport” means a heliport to which a helicopter may proceed when it becomes either impossible or inadvisable to proceed to or to land at the heliport of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use; and alternate heliports include the following—

- (a) take-off alternate which is an alternate heliport at which a helicopter would be able to land should this become necessary shortly after take-off and it is not possible to use the heliport of departure;
- (b) en-route alternate which is an alternate heliport at which a helicopter would be able to land in the event that a diversion becomes necessary while en route; and

- (c) destination alternate which is an alternate heliport at which a helicopter would be able to land should it become either impossible or inadvisable to land at the heliport of intended landing;

“approach and landing phase -helicopters” means that part of the flight from 300 m or 1000 ft above the elevation of the FATO, where the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the bailed landing point;

“appropriate airworthiness requirements” means the comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration;

“appropriate authority” means—

- (a) in relation to an aircraft, the authority which is responsible for approval of design and issuance of a type certificate;
- (b) in relation to the content of a medical kit, the State of Registry;
- (c) in relation to the Uganda, the Director General of the authority;

“approved standard” means a manufacturing, design, maintenance, or quality standard approved by the authority;

“area navigation or RNAV” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids or

a combination of these;

“authority” means the Civil Aviation Authority;

“automatic deployable flight recorder or ADFR” means a combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft;

“cabin crew member” means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member;

“calibration” means a set of operations, performed in accordance with a definite documented procedure, that compares the measurement performed by a measurement device or working standard for the purpose of detecting and reporting or eliminating by adjustment errors in the measurement device, working standard, or aircraft component tested;

“cargo compartment classifications” includes-

- (a) Class A, one in which a presence of a fire would be easily discovered by a crewmember while at station and to which each part of the compartment is easily accessible in flight;
- (b) Class B, one in which—
 - (i) there is sufficient access in flight to enable a crewmember to effectively reach any part of the compartment with the contents of a hand fire extinguisher;
 - (ii) when the access provisions are being used, no hazardous quantity of smoke, flames or extinguishing agent, will enter any compartment occupied by the crew or passengers; and

- (iii) there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station;
- (c) Class C, one in which—
 - (i) there is a separate approved smoke detector or fire detector system to give warning at the pilot or flight engineer station;
 - (ii) there is an approved built-in fire extinguishing or suppression system controllable from the cockpit;
 - (iii) there is means to exclude hazardous quantities of smoke, flames, or extinguishing agent, from any compartment occupied by the crew or passengers; and
 - (iv) there are means to control ventilation and drafts within the compartment so that the extinguishing agent used can control any fire that may start within the compartment;
- (d) Class E, one on airplanes used only for the carriage of cargo and in which—
 - (i) there is a separate approved smoke or fire detector system to give warning at the pilot or flight engineer station;
 - (ii) there are means to shut off the ventilating airflow to or within, the compartment, and the controls for these means are accessible to the flight crew in the crew compartment;
 - (iii) there are means to exclude hazardous quantities of smoke, flames, or noxious gases, from the flight crew compartment; and

(iv) the required crew emergency exits are accessible under any cargo loading condition;

“Category II or CAT II operations” means a precision instrument approach and landing with a decision height lower than 60m or 200 ft, but not lower than 30m or 10 ft, and a runway visual range not less than 350m;

“Class 1 helicopter” means a helicopter with performance such that, in case of critical engine failure, it is able to land on the rejected take-off area or safely continue the flight to an appropriate landing area, depending on when the failure occurs;

“Class 2 helicopter” means a helicopter with performance such that, in case of critical engine failure, it is able to safely continue the flight, except when the failure occurs prior to a defined point after take-off or after a defined point before landing, in which case a forced landing may be required;

“Class 3 helicopter” means a helicopter with performance such that, in case of engine failure at any point in the flight profile, a forced landing shall be performed;

“combined vision system or CVS” means a system to display images from a combination of an enhanced vision system or EVS and a synthetic vision system (SVS);

“commercial air transport operations” means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire;

“Contracting States” means all states that are signatories to the Convention on International Civil Aviation or Chicago Convention;

- “controlled flight” means any flight which is subject to an air traffic control clearance;
- “contaminated runway” means a runway is contaminated when a significant portion of the runway surface area, whether in isolated areas or not within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors;
- “continuing airworthiness” means a set of processes by which an aircraft, engine, rotor or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life;
- “continuing airworthiness records” means records which are related to the continuing airworthiness status of an aircraft, engine, rotor or associated part;
- “corporate aviation operation” means the non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot or pilots employed to fly the aircraft;
- “continuous descent final approach or CDFA” means a technique, consistent with stabilized approach procedures, for flying the final approach segment or FAS of an instrument non-precision approach or NPA procedure as a continuous descent, without level-off, from an altitude or height at or above the final approach fix altitude/height to a point approximately 15 m or 50 ft above the landing runway threshold or the point where the flare maneuver begins for the type of aircraft flown, for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima (circling OCA/H) or visual flight manoeuvre altitude or height are reached;

“crew member” means a person assigned by an operator to duty on an aircraft during a flight duty period;

“critical engine” means the engine whose failure would most adversely affect the performance or handling qualities of an aircraft;

“decision altitude or DA, or decision height or D” means a specified altitude or height in a 3D instrument approach operation at which a missed approach shall be initiated where the required visual reference to continue the approach has not been established, and—

- (a) decision altitude or DA is referenced to mean sea level and decision height, or DH is referenced to the threshold elevation.
- (b) the required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation: and
- (c) for convenience where both expressions are used, they may be written in the form “decision altitude/height” and abbreviated “DA/H”;

“defined point after take-off or DPATO” means a point, within the take-off and initial climb phase, before which the helicopter’s ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

“defined point before landing or DPBL” means a point, within the approach and landing phase, after which the

helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

“electronic flight bag or EFB” means an electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties;

“elevated heliport” means a heliport located on a raised structure on land;

“emergency locator transmitter or ELT” means equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated; and an ELT may be any of the following—

- (a) “automatic fixed ELT or ELT-AF” means an automatically activated ELT which is permanently attached to an aircraft;
- (b) “automatic portable ELT or ELT-AP” means an automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.
- (c) “automatic deployable ELT or ELT-AD” means an ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact and, in some cases, also by hydrostatic sensors and manual deployment is also provided; and
- (d) “survival ELT or ELT-S” means an ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency and manually activated by survivors.

“engine” means a unit used or intended to be used for aircraft propulsion and consists of at least those components and equipment necessary for functioning and control, but excludes the propeller or rotors where applicable.

“enhanced vision system or EVS” means a system to display electronic real-time images of the external scene achieved through the use of image sensors;

“extended flight over water” means a flight operated over water at a distance of more than 93 km or 50 NM, or 30 minutes at normal cruising speed, whichever is the lesser, away from land suitable for making an emergency landing.

“final approach segment or FAS” means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished;

“flight crew member” means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period;

“flight data analysis” means a process of analyzing recorded flight data in order to improve the safety of flight operations;

“flight manual” means a manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft;

“flight plan” means specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft;

“flight recorder” means any type of recorder installed in the aircraft for the purpose of complementing accident or incident Investigation;

“flight time - aeroplanes” means the total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight;

“flight time - helicopters” means the total time from the moment the helicopter blades start turning until the moment the helicopter finally comes to rest at the end of the flight and the rotor blades are stopped;

“general aviation operation” means an aircraft operation other than a commercial air transport operation or an aerial work operation;

“head-up display HUD” means a display system that presents flight information into the pilot’s forward external field of view;

“helicopter” means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

“heliport” means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters;

“heliport operating minima” means the limits of usability of a heliport for—

- (a) take-off, expressed in terms of runway visual range or visibility and, if necessary, cloud conditions;
- (b) landing in 2D instrument approach operations, expressed in terms of visibility or runway visual

range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and

- (c) landing in 3D instrument approach operations, expressed in terms of visibility or runway visual range and decision altitude/height (DA/H) as appropriate to the type or category of the operation.

“hostile environment” means an environment in which—

- (a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate;
- (b) the helicopter occupants cannot be adequately protected from the elements;
- (c) search and rescue response or capability is not provided consistent with anticipated exposure; or
- (d) there is an unacceptable risk of endangering persons or property on the ground;

“human factors principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

“human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations

“instrument approach operations” means an approach and landing using instruments for navigation guidance based on an instrument approach procedure; and there are two methods for executing instrument approach operations—

- (a) a two-dimensional or 2D instrument approach operation, using lateral navigation guidance only; and
- (b) a three-dimensional or 3D instrument approach operation, using both lateral and vertical navigation guidance. Lateral and vertical navigation guidance refers to the guidance provided either by-
 - (i) a ground-based radio navigation aid; or
 - (ii) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these;

“instrument approach procedure or IAP” means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, where a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply-

- (a) non-precision approach or NPA procedure- an instrument approach procedure designed for 2D instrument approach operations Type A;
- (b) approach procedure with vertical guidance or APV- a performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A; and
- (c) precision approach or PA procedure- an instrument approach procedure based on navigation systems, ILS, MLS, GLS and SBAS CAT I designed for 3D instrument approach operations Type A or B;

“instrument meteorological conditions or IMC” means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling as defined in the Civil Aviation (Rules of the Air) Regulations, less than the minima specified for visual meteorological conditions.

“inspection” means the examination of an aircraft or aircraft component to establish conformity with a standard approved by the authority.

“integrated survival suit” means a survival suit which meets the combined requirements of the survival suit and life jacket.

“large aeroplane” means an aeroplane of a maximum certificated take-off mass of over 5 700 kg;

“low-visibility operations or LVO” means approach operations in RVRs less than 550 m or with a DH less than 60 m or 200 ft or take-off operations in RVRs less than 400 m;

“maintenance” means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“maintenance programme” means a document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies;

“maintenance release” means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory

manner in accordance with appropriate airworthiness requirements;

“master minimum equipment list or MMEL” means a list established for a particular aircraft type by the organisation responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight and the MMEL may be associated with special operating conditions, limitations or procedures;

“maximum mass” means maximum certificated take-off mass;

“meteorological information” means meteorological report, analysis, forecast and any other statement relating to existing or expected meteorological conditions;

“minimum descent altitude (MDA) or minimum descent height (MDH)” means a specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference;

“minimum equipment list or MEL” means a list that provides for the operation of an aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type;

“modification” means a change to the type design of an aircraft, engine or propeller;

“navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace and there are two kinds of navigation specifications namely—

- (a) “required navigation performance or RNP specification”, a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP; and
- (b) “area navigation or RNAV specification”, a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, such as RNAV 5, RNAV 1;

“night” means the hours between the end of evening civil twilight and the beginning of morning civil twilight or the time between fifteen minutes after sunset and fifteen minutes before sunrise, sunrise and sunset being determined at surface level, and includes any time between sunset and sunrise when an unlighted aircraft or other unlighted prominent object cannot clearly be seen at a distance of 4,572 metres;

“non-congested hostile environment” means a hostile environment outside a congested area;

“non-hostile environment” means an environment in which—

- (a) a safe forced landing can be accomplished because the surface and surrounding environment are adequate;
- (b) the helicopter occupants can be adequately protected from the elements;
- (c) search and rescue response and capability is provided consistent with anticipated exposure; and
- (d) the assessed risk of endangering persons or property on the ground is acceptable;

“obstacle clearance altitude (OCA) or obstacle clearance height (OCH)” means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria;

“offshore operations” means operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations and such operations include, support of offshore oil, gas and mineral exploitation and sea-pilot transfer;

“operation” means an activity or group of activities which are subject to the same or similar hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards and such activities could include, but would not be limited to, offshore operations, heli-hoist operations or emergency medical service;

“operational control” means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft, the regularity and efficiency of the flight;

“operational flight plan-aeroplane” means the operator’s plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned;

“operational flight plan- helicopter” means the operator’s plan for the safe conduct of the flight based on considerations of helicopter performance, other operating limitations and relevant expected conditions on the route to be followed and at the heliports concerned;

“operations in performance Class 1” means operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point or TDP or after passing the landing decision point or LDP, in which cases the helicopter must be able to land within the rejected take-off or landing area;

“operations in performance Class 2” means operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required;

“operations in performance Class 3” means operations with performance such that, in the event of an engine failure at any time during the flight, a forced landing will be required;

“operations manual” means a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties;

“operations specifications” means the authorizations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual;

“operator” means a person, organization or enterprise engaged in or offering to engage in an aircraft operation;

“performance-based communication or PBC” means communication based on performance specifications applied to the provision of air traffic services;

- “performance-based navigation or PBN” means area navigation based on performance requirements for aircraft operating along an airspace;
- “performance-based surveillance or PBS” means surveillance based on performance specifications applied to the provision of air traffic services;
- “pilot-in-command” means a pilot designated by the operator or the owner as being in command and charged with the safe conduct of a flight;
- “pressurised aircraft” means an aircraft fitted with means of controlling out flow of cabin air in order to maintain maximum cabin altitude of not more than 10,000 ft so as to enhance breathing and comfort of passengers and crew;
- “pressure-altitude” means an atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the standard atmosphere;
- “propeller” means a device for propelling an aircraft that has blades on a powerplant driven shaft and that, when rotated, produces by its action on the air, a thrust approximately perpendicular to its plane of rotation including control components normally supplied by its manufacturer, but does not include main and auxiliary rotors or rotating airfoils of powerplants;
- “prototype” means an aircraft in respect of which an application has been made for a certificate of airworthiness and the design of which has previously been investigated in connection with any such application;
- “repair” means the restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance

with the appropriate airworthiness requirements, after it has been damaged or subjected to wear;

“required communication performance or RCP specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability and operations needed to support performance-based communication;

“required surveillance performance or RSP specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability and operations needed to support performance-based surveillance;

“runway visual range or RVR” means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line;

“safe forced landing” means unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface;

“series of flights” means consecutive flights that—

- (a) begin and end within a period of 24 hours; and
- (b) are all conducted by the same pilot-in-command;

“small aircraft” means an aircraft of a maximum certificated take-off mass of 5,700kg or less;

“specific approval” means an approval which is documented in the operations specifications for commercial air transport operations or in the list of specific approvals for non-commercial operations;

- “State of the Aerodrome” means the state in whose territory the aerodrome is located;
- “State of Registry” means the state on whose register the aircraft is entered;
- “State of the Operator” means the State in which the operator’s principal place of business is located or, if there is no such place of business, the operator’s permanent residence;
- “State of the principal location of a general aviation operator” means the State in which the operator of a general aviation aircraft has its principal place of business or, if there is no such place of business, its permanent residence;
- “synthetic vision system or SVS” means a system to display data-derived synthetic images of the external scene from the perspective of the flight deck;
- “threshold time” means the range, expressed in time, established by the authority, to an en-route alternate aerodrome, whereby any time beyond requires a specific approval for EDTO from the authority;
- “total vertical error or TVE” means the vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude or flight level;
- “Technical Guidance Materials” means any guidance published by the authority that helps to illustrate the meaning of a requirement or specifications and is used to support the interpretation of the Regulation, issued in two categories; namely, Advisory Circulars and Forms for Aviation Industry and Orders, Checklists and Manuals for Authority Inspectors;

“overhaul” means the restoration of an aircraft or aircraft component using methods, techniques and practices acceptable to the Authority, including disassembly, cleaning, inspection as permitted, repair as necessary, reassembly and testing in accordance with approved standards and technical data or in accordance with current standards and technical data acceptable to the authority, which have been developed and documented by the State of Design, holder of the type certificate, supplemental type certificate, or a material, part, process, or appliance approval under Parts Manufacturing Approval or Technical Standard Order;

“VFR” means the abbreviation used to designate the Visual Flight Rules; and

“visual meteorological conditions or VMC” means meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, □teorological conditions expressed in ter.

3. Application

(1) These Regulations prescribe the minimum instrument and equipment requirements for all aircraft in all operations as classified in these Regulations.

(2) Subject to subregulation (1), these Regulations apply to operations as follows—

- (a) Part II-applies to all aircraft in all operations;
- (b) Part III-applies to all aeroplanes for both domestic and international commercial air transport operations;
- (c) Part IV-applies to aeroplanes for general aviation operations;

- (d) Part V- applies to all large aeroplanes and turbo jet aeroplanes for general aviation operations;
- (e) Part VI- applies to all helicopters for both domestic and commercial air transport operations; and
- (f) Part VII- applies to all helicopters for general aviation operations.

PART II—GENERAL REQUIREMENTS FOR AIRCRAFT INSTRUMENTS,
EQUIPMENT AND FLIGHT DOCUMENTS

4. All aircraft in all operations-applicability

This Part provides for aircraft instruments, equipment and flight documents requirements for all aircraft in all operations.

5. General instruments, equipment and flight documents requirements

(1) A person or an operator shall not fly an aircraft into Uganda or registered in Uganda, unless the aircraft is equipped as specified under these Regulations.

(2) A person or an operator may, in addition to the instruments or equipment specified in these Regulations, install additional or special equipment for aircraft operating or registered in Uganda.

(3) An operator operating an aircraft in Uganda shall ensure that all the required emergency equipment as installed on board the aircraft, are clearly marked, and the aircraft is stowed or maintained so as to not be the source of danger on the aircraft.

(4) In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment, and flight documents required in these Regulations shall be installed or carried, as appropriate, in all aircraft according to the aircraft use and to the circumstances under which the flight is to be conducted.

(5) Subject to subregulation (4), all required instruments and equipment including their installation shall be approved or accepted by the authority.

(6) An aircraft shall be equipped with instruments to enable the flight crew to control the flight path of the aircraft, carry out any required procedural manoeuvres and observe the operating limitations of the aircraft in the expected operating conditions.

(7) Prior to operation in Uganda of any foreign registered aircraft that uses an airworthiness maintenance program approved or accepted by the State of Registry, the owner or operator shall ensure that instruments and equipment required by these Regulations but not installed in the aircraft are properly installed and inspected in accordance with the requirements of the State of Registry.

(8) An owner or operator shall ensure that a flight does not commence unless the required equipment—

- (a) meets the minimum performance standard, the operational and airworthiness requirements in accordance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022;
- (b) is installed such that the failure of any single unit required for either communication or navigation purposes, or both, shall not result in the inability to communicate or navigate safely on the route being flown; and
- (c) is in operable condition for the kind of operation being conducted, except as provided for in the minimum equipment list.

(9) Where equipment is to be used by one flight crewmember at his or her station during flight, that equipment shall be installed so as to be readily operable from his or her station.

(10) Where a single item of equipment is required to be operated by more than one flight crewmember, the equipment shall be installed so as to be readily operable from any station at which it is required to be operated.

(11) Where a means is provided on any aircraft for transferring an instrument from its primary operating system to an alternative system, the means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

(12) An instrument used by a flight crewmember shall be so arranged as to permit the flight crewmember to readily see the indications from station with the minimum practicable deviation from the position and line of vision, which the flight crewmember normally assumes when looking forward along the flight path.

6. Standby attitude indicator

(1) An operator shall not operate an aeroplane with a maximum certificated take-off mass exceeding 5700 kg or a performance Class 1 or 2 helicopter unless it is equipped with a single standby attitude indicator that —

- (a) operates independently of any other attitude indicating system;
- (b) is powered continuously during normal operation; and
- (c) after a total failure of the normal electrical generating system is automatically powered for a minimum of 30 minutes from a source independent of the normal electrical generating system.

(2) Where the standby attitude indicator is being operated by emergency power, it shall be clearly operating and illuminated to the flight crew.

(3) Where the standby attitude indicator has its own dedicated power supply, there shall be an associated indication, either on the instrument or on the instrument panel when this supply is in use.

(4) Where the standby attitude instrument system is installed and usable through flight attitudes of 360 degrees of pitch and roll, the turn and slip indicators may be replaced by slip indicators.

7. Standby compass calibration

(1) An operator of an aircraft shall ensure that an installed compass on an aircraft is calibrated every after twelve months except where the approved maintenance programme prescribes a different period.

(2) A compass shall be calibrated for out- of- phase occurrence's including —

- (a) whenever a magnetic sensing element has been changed or relocated;
- (b) where the compass has a deviation that is out of acceptable limits on any reading;
- (c) where the deviations of the compass are in any way different from those on the existing compass deviation card;
- (d) after a major overhaul of the aircraft, removal or replacement of any magnetic material which may affect the accuracy of the compass;
- (e) after installation of a new electrical or radio system or major medication of the existing electrical or radio system;
- (f) after installation of geographical survey equipment or other equipment that are likely to have strong external magnetic field;

- (g) if it is considered likely that carriage of a specific freight load that has a magnetic influence thereby affect compass readings;
- (h) whenever a compass has been subjected to shock like after a heavy landing;
- (i) after an aircraft has passed through a severe electrical storm;
- (j) when an aircraft operation is changed to a different geographical location with a major change in magnetic deviation;
- (k) positioning the aircraft within 92 meters from any metal object;
- (l) after an aircraft has been parked on one heading for over a year; and
- (m) when flax valves are replaced.

8. Aircraft lights and instruments illumination

An operator shall not operate an aircraft unless it is equipped with—

- (a) for flight by day—
 - (i) anti-collision light system;
 - (ii) lighting supplied from the aircraft electrical system to provide adequate illumination for all instruments and equipment essential for the safe operation of the aircraft;
 - (iii) lighting supplied from the aircraft electrical system to provide adequate illumination in all passenger compartments; and
 - (iv) an electric torch for each required crewmember

readily accessible to crewmember when seated at their designated station;

- (b) for flight by night, in addition to the equipment specified in paragraph (a) —
 - (i) the lights required under the Civil Aviation (Rules of the Air) Regulations, 2020 for an aircraft in flight or operating on the movement area of an aerodrome.
 - (ii) lighting supplied from the aircraft electrical system to provide adequate illumination for all instruments and equipment essential for the safe operation of the aircraft;
 - (iii) lights in all passenger compartments.
 - (iv) an electric torch for each crewmember station;
 - (v) navigation or position lights; and
 - (vi) landing lights.

9. Engine instruments

An operator shall not operate an engine-powered aircraft without the following engine instruments—

- (a) a means for indicating fuel quantity in each fuel tank to be used;
- (b) an oil pressure indicator for each engine;
- (c) an oil temperature indicator for each engine;
- (d) a manifold pressure indicator for each altitude engine; and
- (e) a tachometer for each engine.

10. Landing gear position indicator and aural warning device

An operator shall not operate a powered civil aircraft with retractable landing gear unless it has a landing gear position indicator.

11. Survival kit

An operator shall not operate an aircraft across land areas, which have been designated by the authority as areas in which search and rescue would be especially difficult, unless equipped with enough survival kits for the number of occupants of the aircraft appropriate for the route to be flown.

12. Emergency locator transmitter batteries

(1) For each aircraft, batteries used in emergency locator transmitters shall be replaced or recharged, and the battery is rechargeable, when—

- (a) the transmitter has been in use for more than one cumulative hour; or
- (b) 50 percent of their useful life, or for rechargeable batteries, 50 percent of their useful life of charge, has expired.

(2) The expiration date for a replacement or recharged emergency locator transmitter battery shall be legibly marked on the outside of the transmitter on all aircraft.

13. Crash axe

(1) An operator shall not operate an aeroplane with a maximum certificated take-off mass of over 5,700 kg or having a maximum approved passenger seating configuration of more than nine seats unless it is equipped with at least one crash axe or crowbar located in the cockpit.

(2) Where the maximum approved passenger-seating configuration is more than 200 passengers, an additional crash axe or crowbar shall be carried and located in or near the most rearward galley area.

(3) An operator shall not operate a helicopter with a maximum certificated mass of over 3,175 kg unless the helicopter is equipped

with atleast one crash axe.

(4) Crash axes or crowbars located in the passenger compartment shall not be visible to the passengers.

14. Icing protection equipment

(1) A person shall not operate an aircraft in expected or actual icing conditions unless it is equipped for the prevention or removal of ice on windshields, wings, control surfaces, empennage, propellers, rotor blades, or other parts of the aircraft where ice formation will adversely affect the safety of the aircraft.

(2) A person shall not operate an aircraft in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice.

(3) Subject to subregulation (2), any illumination that is used shall be of a type that will not cause glare or reflection that would handicap crewmembers in the performance of their duties.

15. Pitot heat and indication systems

(1) An operator shall not operate an aircraft in instrument flight conditions unless it is equipped with a pitot heat system.

(2) An operator shall not operate an aircraft equipped with a flight instrument pitot heating system unless the aircraft is also equipped with an operable pitot heat indication system.

(3) The indication provided shall incorporate an amber light that is in clear view of a flight crew member, the indication provided shall be designed to alert the flight crew if—

- (a) the pitot heating system is switched “off”;
- (b) the pitot heating system is switched “on”; and
- (c) any pitot tube heating element is inoperative.

(4) An operator shall not operate an aircraft equipped with an integrated flight crew alerting system that will notify the crew if the

pitot system is malfunctioning.

16. Static pressure system

(1) An operator shall not operate an aircraft unless it is equipped with a static pressure system vented to the outside atmospheric pressure so that it is least affected by airflow variation or moisture or other foreign matter and installed so as to be airtight except for the vent.

(2) An operator shall not operate an aircraft in instrument flight rules or visual flight rules at night unless it is equipped with a static pressure system vented to the outside atmospheric pressure so that it is least affected by airflow variation or moisture or other foreign matter, and installed so as to be airtight except for the vent and a means of selecting an alternative source of static pressure.

(3) An operator shall not operate an aeroplane in accordance with instrument flight rules or by night unless the aeroplane is equipped with two independent static pressure systems, except that for propeller -driven aeroplanes with maximum certificated take-off mass of 5,700 kg or less, one static pressure system and one alternate source of static pressure is allowed.

17. Safety and survival equipment

(1) A person shall not operate an aircraft unless safety and survival equipment that the crew or passengers are expected to use or operate at the time of an emergency are—

- (a) reliable;
- (b) readily accessible;
- (c) easily identified; and
- (d) its method of operation shall be plainly marked.

(2) An item of safety and survival equipment referred to in subregulation (1) shall be inspected regularly in accordance with

inspection periods approved by the authority.

18. Markings and placards

(1) A person or operator shall not operate an aircraft unless markings and placards on instruments, equipment, controls include such limitations or information as necessary for the direct attention of the flight crew during flight.

(2) Subject to subregulation (1), markings and placards or instructions shall be provided to give any information that is essential to the ground crew in order to preclude the possibility of mistakes in ground servicing such as towing, refuelling that could pass unnoticed and that could jeopardize the safety of the aircraft in subsequent flights.

PART III—COMMERCIAL AIR TRANSPORT —AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

19. Aeroplanes for both domestic and international commercial air transport operations-applicability

This Part provides for aircraft instruments, equipment and flight documents requirements for all aeroplanes for both domestic and international commercial air transport operations.

20. Air operator certificate

(1) An aeroplane registered in Uganda shall, carry a certified true copy of the air operator certificate specified in the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 currently in force and a copy of the operations specifications relevant to the aeroplane, issued in conjunction with the certificate.

(2) When the certificate and the associated operations specifications are issued by the State of Operator in a language other than English, an english translation shall be included.

21. Minimum Equipment List (MEL)

(1) The operator shall include in the operations manual a

MEL, approved by the State of the Operator which shall enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

(2) Where the State of the Operator is not the State of Registry, the State of the Operator shall ensure that the minimum equipment list does not affect the aeroplane's compliance with the airworthiness requirements applicable in the State of Registry.

22. Aircraft operating manual

(1) The operator shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft.

(2) The manual shall include details of the aircraft systems and of the checklists to be used and the design of the manual shall observe human factors principles.

23. Aeroplane operated under Article 83 bis agreement

(1) A person shall not operate an aeroplane under Article 83 bis agreement entered into between the State of Registry and the State of the Operator, without carrying on board the aircraft a certified true copy of the agreement summary, in either an electronic or hard copy format.

(2) Where the agreement summary specified in subregulation (1) is issued in a language other than English, an English translation shall be included.

(3) The agreement summary of the Article 83 bis agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred under the agreement by the State of Registry to the State of the Operator, when conducting surveillance activities such as ramp checks.

(4) The agreement summary shall be transmitted to ICAO

together with the Article 83 bis Agreement for registration with the ICAO Council by the State of Registry or the State of the Operator.

(5) The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council shall contain the list of all aircraft affected by the agreement while the certified true copy required to be carried on board as required in subregulation (1) shall list only the specific aircraft carrying the copy.

(6) The agreement summary shall contain the information for the specific aircraft and shall follow the layout provided in the Schedule 1 to these Regulations.

24. Aeroplane on all flights

An operator shall not operate an aeroplane unless it is equipped with instruments, which will enable the flight crew to control the flight path of the aeroplane, carry out any required procedural manoeuvres and observe the operating limitations of the aeroplane in the expected operating conditions.

25. Medical Supplies

(1) An operator shall not operate an aeroplane unless it is equipped with adequate and accessible medical supplies comprising of—

- (a) one or more first-aid kits for the use of cabin crew in managing incidents of ill health.
- (b) for aeroplanes required to carry cabin crew as part of the operating crew, one universal precaution kit, two for aeroplanes authorized to carry more than 250 passengers, for the use of cabin crew members in managing incidents of ill health associated with a case of suspected communicable disease or in the case of illness involving contact with body fluids; and
- (c) for aeroplanes authorised to carry more than 100 passengers, on a sector length of more than two hours, a medical kit,

for the use of medical doctors or other qualified persons in treating in-flight medical emergencies.

(2) The type, number, location and content of the medical supplies referred to in subregulation (1) shall be specified in the applicable technical guidance materials.

26. Portable fire extinguishers

(1) An operator shall not operate an aeroplane unless it is equipped with portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aeroplane and at least one shall be located in—

- (a) the pilot's compartment; and
- (b) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

(2) Subject to subregulation (1), an aircraft shall be equipped with portable fire extinguishers accessible for use in crew, passenger and cargo compartments as follows—

- (a) the type and quantity of extinguishing agent shall be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used;
- (b) portable fire extinguisher, containing new technology of halon alternative agent and shall be conveniently located on the cockpit for use by the flight crew;
- (c) at least one portable fire extinguisher shall be provided and conveniently located for use in each Class E cargo compartment which is accessible to crew members during flight, and at least one shall be located in each upper and lower lobe galley;
- (d) at least one portable fire extinguisher shall be conveniently located on the flight deck for use by the flight crew;

- (e) at least one portable fire extinguisher shall be conveniently located in the passenger compartment if the passenger compartment is separate from the flight deck and not readily accessible to the flight crew;
- (f) for each aeroplane having a passenger seating capacity of more than thirty, there shall be at least the following number of portable fire extinguishers conveniently located and uniformly distributed throughout the compartment—
 - (i) seven through twenty-nine one portable fire extinguisher;
 - (ii) thirty through sixty-two portable fire extinguisher;
 - (iii) sixty-one through two hundred -three portable fire extinguishers;
 - (iv) two hundred one through three hundred-four portable fire extinguishers;
 - (v) three hundred one through four hundred- five portable fire extinguishers;
 - (vi) four hundred and one through five hundred-six portable fire extinguishers;
 - (vii) five hundred and one through six hundred- seven portable fire extinguishers;and
 - (vii) six hundred and one and above- eight portable fire extinguishers;
- (g) at least one of the required fire extinguishers located in the passenger compartment of an Aeroplane with a maximum approved passenger seating configuration of at least thirtyone, and not more than sixty, and at least two of the fire extinguishers located in the passenger compartment of an aeroplane with a maximum approved passenger seating.

27. Seat, berth and seat belt or safety harness

- (1) An aeroplane shall be equipped with—
- (a) a seat or berth with safety belt for each person on board over the age of two years;
 - (b) a seat belt for each seat and restraining belts for each berth; and
 - (c) a safety harness for each flight crew member seat.

(2) The safety harness for each pilot seat shall incorporate a device, which automatically restrains the occupant's torso in the event of rapid deceleration.

(3) The safety harness for each pilot seat shall incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls.

28. Fasten seat belt, use of oxygen, no smoking, life jackets and emergency exit

An operator shall not operate an aeroplane unless it is equipped with means of ensuring that the following information and instructions are conveyed to passengers—

- (a) when seat belts are to be fastened;
- (b) when and how oxygen equipment is to be used where carriage of oxygen is applicable;
- (c) restrictions on smoking;
- (d) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and
- (e) location and method of opening emergency exits.

29. Spare electrical fuses

An operator shall not operate an aeroplane unless it is equipped with spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

30. Lavatory fire extinguisher

(1) An operator shall not operate an aeroplane carrying passengers unless each lavatory in the aeroplane is equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste located within the lavatory.

(2) Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31st December, 2011 and any extinguishing agent used in a portable fire extinguisher in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31st December 2018 shall—

- (a) meet the applicable minimum performance requirements of the authority; and
- (b) not contain Halon 1211, Halon 1301, or Halon 2402.

(3) Built-in lavatory fire extinguishers shall be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in the receptacle.

31. Operations manual, flight manual and charts

An operator shall not operate an aeroplane unless it carries—

- (a) the operations manual prescribed in the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 or those parts of it that pertain to flight operations;
- (b) the flight manual for the aeroplane, or other documents containing performance data required for the application of aeroplane performance operating limitations in accordance with the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and

- (c) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.

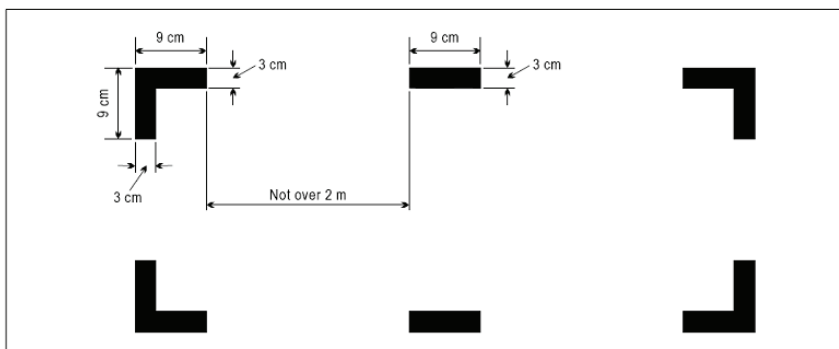
32. Marking of break-in points

(1) Where areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on an aeroplane, such areas shall be marked as shown below in Figure 1.

(2) The colour of the markings shall be red or yellow, and where necessary they shall be outlined in white to contrast with the background.

(3) Where the corner markings are more than 2m apart, intermediate lines $9\text{ cm} \times 3\text{ cm}$ shall be inserted so that there is no more than 2m between adjacent markings.

Figure 1: Marking of break-in points



33. Flight recorders

(1) Crash-protected flight recorders shall comprise one or more of the following—

- (a) a flight data recorder or FDR;
- (b) a cockpit voice recorder or CVR;
- (c) an airborne image recorder or AIR; or
- (d) a data link recorder or DLR.

(2) The image and data link information may be recorded on either the CVR or the FDR in accordance with Schedule 2 of these Regulations.

(3) Lightweight flight recorders comprise one or more of the following—

- (a) an aircraft data recording system or ADRS;
- (b) a cockpit audio recording system or CARS;
- (c) an airborne image recording system or AIRS; or
- (d) a data link recording system or DLRS.

(4) The image and data link information for lightweight flight recorders shall be recorded on either the CARS or the ADRS in accordance with Schedule 2 of these Regulations.

(5) The parameters to be recorded are listed in Schedule 2 to these Regulations.

34. Flight data recorders (FDR) and flight data recording systems - applicability

(1) An operator shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass of 5700 kg or less for which the application for type certification is submitted to the authority on or after 1 January 2016 unless the aeroplane is equipped with—

- (a) a FDR which shall record at least the first 16 parameters listed in table A8-1 in Schedule 2 to these Regulations;
- (b) a class C airborne image recording (AIR) or airborne image recording system (AIRS) which shall record at least the flight path and speed parameters displayed to the pilot or pilots as defined in Schedule 2 to these Regulations; or
- (c) an aircraft data recording system (ADRS) which shall record at least the first 7 parameters listed in table A8-3 in Schedule 2 to these Regulations.

(2) All turbine-engined aeroplane of a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with—

- (a) a flight data recorder or (FDR) which shall record at least the first 16 parameters listed in table A8-1 in Schedule 2 to these Regulations; or
- (b) a class C airborne image recording (AIR) or airborne image recording system (AIRS) which shall record at least the flight path and speed parameters displayed to the pilot or pilots; as defined in Schedule 2 to these Regulations; or
- (c) an aircraft data recording system (ADRS) which shall record at least the first 7 parameters listed in table A8-3 in Schedule 2 to these Regulations.

(3) All aeroplanes of a maximum certificated take-off mass of over 27,000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with FDR which shall record at least the first 32 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(4) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg, up to and including 27,000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, shall be equipped with an FDR which shall record at least the first 16 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(5) All multi-engined turbine aeroplanes of a maximum certificated take-off mass of 5,700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 1990 shall be equipped with an FDR which shall record at least the first 16 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(6) All turbine-engined aeroplanes, for which the individual

certificate of airworthiness was first issued before 1 January 1989, with a maximum certificated take-off mass of over 5,700 kg, except those in subregulation (8), shall be equipped with an FDR which shall record at least the first 5 parameters listed in table A8-1 to Schedule 2 of these Regulations.

(7) All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987 but before 1st January 1989, with a maximum certificated take-off mass of over 5,700 kg, except those in subregulation (8), shall be equipped with an FDR which shall record at least the first 9 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(8) All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take-off mass of over 27,000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30th September 1969 shall be equipped with an FDR which shall record at least the first 16 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(9) All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1st January, 1987, with a maximum certificated take-off mass of over 27,000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30th September, 1969 shall be equipped with an FDR which shall record, in addition to the first 5 parameters listed in the table A8-1 of Schedule 2 to these Regulations, such additional parameters as are necessary to meet the objectives of determining-

- (a) the attitude of the aeroplane in achieving its flight path; and
- (b) the basic forces acting upon the aeroplane resulting in the achieved flight path and the origin of such basic forces.

(10) All aeroplanes of a maximum certificated take-off mass of

over 5,700 kg for which the individual certificate of airworthiness is first issued after 1 January 2005 shall be equipped with a FDR which shall record at least the first 78 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(11) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which the application for type certification is submitted to a Contracting State on or after 1st January, 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table A8-1 of Schedule 2 to these Regulations.

(12) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which individual certificate of airworthiness is first issued to a Contracting State on or after 1st January, 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in table A8-1 of Schedule 2 to these Regulations.

(13) Flight data recording system shall be inspected annually, and the inspection report submitted to the authority.

(14) The flight recorder referred to in subregulation (1) shall—

- (a) be calibrated and maintained in accordance with a maintenance program approved by the authority, and in any case not more than five years, with a valid certificate of release to service issued in accordance with these Regulations certifying that maintenance has been carried out in accordance with such maintenance schedule; and
- (b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz.

35. Recording technology

An operator of an aeroplane shall not use engraving metal foil, frequency modulation, photographic film or magnetic tape on flight data recorders or aircraft data recording systems.

36. Duration of FDR

An operator shall not operate an aeroplane unless it is installed with an FDR capable of retaining information recorded during at least the last 25 hours of its operation, with exception of those installed on aeroplanes referenced in regulation 34 (5) for which the FDR retains the information recorded during at least the last 30 minutes of its operation, and in addition sufficient information from the preceding take-off for calibration purpose.

37. Cockpit voice recorders (CVR) and cockpit audio recording systems (CARS) - applicability

(1) All turbine-engined aeroplanes of a maximum certificated take-off mass of over 2,250 kg, up to and including 5,700 kg, for which the application for type certification is submitted to a Contracting State on or after 1st January, 2016 and required to be operated by more than one pilot shall be equipped with either a CVR or a CARS.

(2) All turbine-engined aeroplanes of a maximum certificated take-off mass of 5,700 kg or less for which the individual certificate of airworthiness is first issued on or after 1st January, 2016 and required to be operated by more than one pilot shall be equipped with either a CVR or a CARS.

(3) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which the individual certificate of airworthiness is first issued on or after 1st January, 1987 shall be equipped with a CVR.

(4) All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1st January, 1987, with a maximum certificated take-off mass of over 5,700 kg that are of types of which the prototype was certificated by the appropriate national authority after 30th September, 1969 shall be equipped with a CVR.

38. CVR-recording technology

An operator shall not operate an aeroplane equipped with CVRS and CARS that use magnetic tape or wire.

39. CVR- duration

(1) An operator shall not operate an aeroplane unless it is equipped with a CVR capable of retaining the information recorded during at least the last 2 hours of its operation.

(2) All aeroplanes of a maximum certificated take-off mass of over 27,000 kg for which the individual certificate of airworthiness is first issued on or after 1st January, 2021 shall be equipped with a CVR which shall retain the information recorded during at least the last 25 hours of its operation.

(3) All aeroplanes that are required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1st January, 2025, shall be equipped with a CARS which shall retain the information recorded during at least the last two hours of their operation.

40. CVR - alternate power source

(1) An alternate power source shall automatically engage and provide 10 minutes, plus or minus one minute, of operation whenever aeroplane power to the recorder ceases, either by normal shutdown or by any other loss of power.

(2) Subject to subregulation (1), the alternate power source shall power the CVR and its associated cockpit area microphone components.

(3) The CVR shall be located as close as practicable to the alternate power source.

(4) All aeroplanes of a maximum certificated take-off mass of over 27,000 kg for which the application for type certification is submitted to a Contracting State on or after 1st January, 2018 shall be provided with an alternate power source, as defined in subregulation (1) that powers the forward CVR in the case of combination recorders.

(5) All aeroplanes of a maximum certificated take-off mass of over 27,000 kg for which the individual certificate of airworthiness is first issued on or after 1st January, 2018 shall be provided with an alternate power source, as defined in subregulation (1) that powers at least one CVR.

41. Data link recorders (DLR)

(1) An operator shall not operate an aeroplane for which the individual certificate of airworthiness is first issued on or after 1st January, 2016 and which uses any of the data link communications applications referred to in paragraph 5.1 (2) of Schedule 2 to these Regulations and is required to carry a CVR, unless the aeroplane records the data link communications messages on a crash-protected flight recorder.

(2) An operator shall not operate an aeroplane for which the individual certificate of airworthiness was first issued before 1st January, 2016 that is required to carry a CVR and is modified on or after 1st January, 2016 to use any of the data link communications applications referred to in paragraph 5.1(2) of Schedule 2 to these Regulations unless the aeroplane records the data link communications messages on a crash-protected flight recorder and the installed data link communications equipment is compliant with a type certificate issued or aircraft modification first approved prior to 1st January, 2016.

(3) An operator shall not operate an aeroplane for which the individual certificate of airworthiness was first issued before 1st January, 2016, that is required to carry a CVR and is modified on or after 1st January, 2016 to use any of the data link communications applications referred to in 5.1(2) of Schedule 2 to these Regulations shall record the data link communications messages on a crash-protected flight recorder.

(4) DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided

these systems have demonstrated high integrity of serviceability and self-monitoring DLR systems.

42. Data link recorders - duration

The minimum recording duration shall be equal to the duration of the CVR.

43. Data link recorders - correlation

Data link recording shall be correlated with the recorded cockpit audio.

44. Flight crew machine interface recordings

(1) An operator shall not operate an aeroplane of a maximum take-off mass of over 5,700 kg for which the application for type certification is submitted to a Contracting State on or after 1st January, 2023 unless it is equipped with a crash-protected flight recorder which shall record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew as defined in Schedule 2 to these Regulations.

(2) The minimum flight crew-machine interface recording duration shall be at least for the last 2 hours and capable of being correlated to the recorded cockpit audio.

45. Flight recorders — general

(1) Flight recorders shall be constructed, located and installed—

- (a) so as to provide maximum practical protection for the recordings in order to preserve, recover or transcribe the recorded information;
- (b) so as to meet the prescribed crashworthiness and fire protection specifications.

(2) When operating an aeroplane, a flight recorder shall—

- (a) not be switched off during flight time;

- (b) be deactivated upon completion of flight time following an accident or incident to preserve flight recorder records;
- (c) not be reactivated before their disposition as determined in accordance with the Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2022.

(3) Operational checks and evaluations of recordings from the flight recorder systems shall be conducted annually to ensure the continued serviceability of the recorders in accordance with the Schedule 2 to these Regulations.

(4) Regarding flight recorder electronic documentation, the documentation requirement concerning FDR and ADRS parameters provided by operators to accident investigation authorities shall be in electronic format and take account of industry specifications.

46. Inspection of cockpit voice recorders

(1) Prior to the first flight of the day, a flight crewmember shall monitor the built-in test features on the cockpit for the cockpit voice recorder.

(2) The operator shall conduct annual inspections of a cockpit voice recorder as follows—

- (a) the read-out of the recorded data shall ensure that the recorder operates correctly for the nominal duration of the recording;
- (b) an annual examination of the recorded signal on the cockpit voice recorder shall be carried out by replay of the recording of cockpit voice recorder;
- (c) while installed in the aircraft, the cockpit voice recorder shall record text signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;
- (d) during the annual examination, a sample of in-flight

recordings of the cockpit voice recorder shall be examined for evidence that the intelligibility of the signal is acceptable; and

(e) operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

(3) The operator shall provide a report of the annual inspection conducted under this regulation to the authority.

47. Combination recorders

(1) An operator shall not operate an aeroplane of a maximum certificated take-off mass of over 5,700 kg for which the application for type certification is submitted to the Contracting State on or after 1st January, 2016, and which is required to be equipped with both a CVR and an FDR, unless it is equipped with two combination recorders, FDR/CVR.

(2) Subject to subregulation (1), one recorder shall be located as close to the cockpit as practicable and the other recorder located as far aft as practicable.

(3) All aeroplanes of a maximum certificated take-off mass over 5,700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders, FDR/CVR.

(4) Subject to subregulation (3), this regulation may be complied with by equipping the aeroplanes with two combination recorders, one forward and one after or separate devices.

(5) All multi-engined turbine-powered aeroplanes of a maximum certificated take-off mass of 5,700 kg or less, required to be equipped with an FDR or a CVR, may alternatively be equipped with one combination recorder, FDR/CVR.

48. Flight recorder data recovery

(1) An operator shall not operate an aeroplane of a maximum certificated take-off mass of over 27,000 kg and authorized to carry

more than 19 passengers for which the application for type certification is submitted to a Contracting State on or after 1st January, 2021 unless it is equipped with a means approved by the State of the Operator, to recover flight recorder data and make it available in a timely manner.

(2) In approving the means to make flight recorder data available in a timely manner, the authority shall take into account the following—

- (a) the capabilities of the operator;
- (b) overall capability of the aeroplane and its systems as certified by the State of Design;
- (c) the reliability of the means to recover the appropriate CVR channels and appropriate FDR data; and
- (d) specific mitigation measures.

49. All aeroplanes operated as VFR flights

(1) An operator shall not operate an aeroplane for VFR flights unless it is equipped with—

- (a) a magnetic compass;
- (b) an accurate timepiece indicating the time in hours, minutes and seconds;
- (c) a sensitive pressure altimeter;
- (d) an airspeed indicator; and
- (e) such additional instruments or equipment as may be prescribed by the authority.

(2) An operator shall not operate an aeroplane for VFR flights, which are operated as controlled flights unless the aeroplane is equipped in accordance with instruments flight rules.

50. All aeroplanes on flights over water

(1) An operator shall not operate a seaplane for all flights unless it is equipped with—

- (a) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
 - (b) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable; and
 - (c) one sea anchor or drogue.
- (2) An operator shall not operate a landplane unless it carries the following equipment—
- (a) when flying over water and at a distance of more than 93 km or 50 NM away from the shore, in the case of landplanes operated in accordance with the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022;
 - (b) when flying en route over water beyond gliding distance from the shore, in the case of all other landplanes; and
 - (c) when taking off or landing at an aerodrome where, in the opinion of the authority, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.
- (3) The equipment referred to in subregulation (1) shall comprise one life jacket or equivalent individual flotation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.
- (4) Life jackets accessible from seats or berths located in crew rest compartments shall only be required when the seats or berths concerned are certified to be occupied during take-off and landing.

51. All aeroplanes on long-range over-water flights

- (1) In addition to the equipment prescribed in regulation 50,

the following equipment shall be installed in all aeroplanes when used over routes on which the aeroplane may be over water and at more than a distance corresponding to 120 minutes at cruising speed or 740km or 400NM, whichever is the lesser, away from land suitable for making an emergency landing in the case of aircraft operated in accordance with the Civil Aviation (Operation of Aircraft - Commercial Air Transport Aeroplanes) Regulations, 2022, and 30 minutes or 185km or 100NM, whichever is the lesser, for all other aeroplanes—

- (a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken;
- (b) equipment for making the pyrotechnical distress signals described in Civil Aviation (Rules of the Air) Regulations, 2020;
- (c) on all aeroplanes of a maximum certificated takeoff mass of over 27,000 kg, a securely attached underwater locating device operating at a frequency of 8.8 kHz; and
- (d) subject to paragraph (c), automatically activated underwater locating device shall operate for a minimum of 30 days and shall not be installed in wings or empennage.

(2) Each life jacket and equivalent individual flotation device, when carried in accordance with these Regulations, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of regulation 50(2) (c) is met by the provision of individual flotation devices other than life jackets.

52. All aeroplanes on flights over designated land areas

An operator shall not operate an aeroplane, across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, unless

the aeroplane is equipped with such signaling devices and life-saving equipment, including means of sustaining life as may be appropriate to the area overflown.

53. All aeroplanes on high altitude flights

(1) Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in these Regulations shall be as follows—

| Absolute pressure | Metres | Feet |
|-------------------|--------------|---------------|
| <i>700 hPa</i> | <i>3 000</i> | <i>10 000</i> |
| <i>620 hPa</i> | <i>4 000</i> | <i>13 000</i> |
| <i>376 hPa</i> | <i>7 600</i> | <i>25 000</i> |

(2) An operator shall not operate an aeroplane at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments unless the aeroplane is equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required under the Civil Aviation (Operation of Aircraft – Commercial Air Transport- Aeroplanes) Regulations, 2022.

(3) An operator of an aeroplane shall not operate at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments unless the aeroplane is provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in the Civil Aviation (Operation of Aircraft – Commercial Air Transport -Aeroplanes) Regulations, 2022.

(4) An operator shall not operate a pressurized aeroplane at flight altitudes at which the atmospheric pressure is less than 376 hPa unless it is equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

(5) An operator shall not operate an aeroplane at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, when operated at flight altitudes at which the atmospheric pressure is more than 376 hPa, cannot descend safely within 4 minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa unless it is provided with automatically deployable oxygen equipment to satisfy the requirements of the Civil Aviation (Operation of Aircraft – Commercial Air Transport- Aeroplanes) Regulations, 2022.

(6) Subject to subregulation (5), the total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

54. All aeroplanes in icing conditions

(1) An operator shall not operate an aeroplane unless it is equipped with suitable de-icing or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

(2) An operator shall not operate an aeroplane in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice.

(3) Any illumination that is used shall be of a type that will not cause glare or reflection that would handicap crewmembers in the performance of their duties.

55. All aeroplanes operated in accordance with instrument flight rules (IFR)

(1) An operator shall not operate an aeroplane in accordance with the instrument flight rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, unless the aeroplane is equipped with—

- (a) a magnetic compass;
- (b) an accurate time piece indicating the time in hours, minutes

and seconds;

- (c) two sensitive pressure altimeters with counter drum-pointer or equivalent presentation;
- (d) an air speed indicating system with means of preventing malfunctioning due to either condensation or icing;
- (e) a turn and slip indicator;
- (f) an attitude indicator or artificial horizon;
- (g) a heading indicator or directional gyroscope;
- (h) a means of indicating whether the power supply to the gyroscopic instrument is adequate;
- (i) a means of indicating in the flight crew compartment the outside air temperature;
- (j) a rate-of-climb and descent indicator; and
- (k) such additional instruments or equipment as may be prescribed by the authority.

(2) The requirements of paragraphs (e), (f) and (g) may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the three separate instruments, are retained.

56. All aeroplanes over 5,700 kg- emergency power supply for electrically operated attitude indicating instruments

(1) An operator shall not operate an aeroplane of a maximum certificated take-off mass of over 5,700 kg newly introduced into service after 1st January 1975 unless it is fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument or artificial horizon, clearly visible to the pilot-in-command.

(2) Subject to subregulation (1), the emergency power supply

shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator or indicators is or are respectively being operated by emergency power.

(3) The instruments used by any one pilot shall be so arranged as to permit the pilot to see their indications readily from his or her station, with the minimum practicable deviation from the position and line of vision normally assumed when looking forward along the flight path.

57. All aeroplanes when operated at night

(1) A person shall not operate an aeroplane at night unless it is equipped with—

- (a) all equipment specified in regulation 55;
- (b) the lights required by the Civil Aviation (Rules of the Air) Regulations, 2020 for aircraft in flight or operating on the movement area of an aerodrome;
- (c) two landing lights;
- (d) illumination for all instruments and equipment that are essential for the safe operation of the aeroplane that are used by the flight crew;
- (e) lights in all passenger compartments; and
- (f) an independent portable light for each crew member station.

(2) Specifications for lights meeting the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 for navigation lights are contained in Schedule 3 to these Regulations.

(3) The general characteristics of lights are specified in Schedule 3 to these Regulations.

58. Pressurized aeroplanes when carrying passengers — weather

radar

An operator shall not carry passengers in a pressurized aeroplane unless it is equipped with operative weather radar whenever such aeroplanes are being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may be expected to exist along the route either at night or under instrument meteorological conditions.

59. All aeroplanes operated above 15,000 m or 49,000 ft-radiation indicator

(1) An operator shall not operate an aeroplane above 15,000 m or 49,000 ft unless it carries equipment to measure and indicate continuously the dose rate of total cosmic radiation received, being the total of ionizing and neutron radiation of galactic and solar origin, and the cumulative dose on each flight.

(2) Subject to subregulation (1), the display unit of the equipment shall be readily visible to a flight crewmember.

60. Document attesting noise certification

(1) An operator of an aeroplane required to comply with noise certification requirements in the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 shall carry on board a document attesting noise certification.

(2) When the document, or suitable statement attesting noise certification as contained in another document approved by the State of Registry is issued in a language other than English, it shall include an English translation.

61. Mach number indicator

An operator shall not operate an aeroplane with speed limitations expressed in terms of Mach number unless the aeroplane is equipped with a Mach number indicator.

62. Aeroplanes required to be equipped with ground proximity warning systems or GPWS

(1) An operator shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers unless it is equipped with a ground proximity warning system, which has a forward-looking terrain avoidance function.

(2) The operator shall implement database management procedures that ensure the timely distribution and update of current terrain and obstacle data to the ground proximity warning system.

(3) All turbine-engined aeroplanes of a maximum certificated take-off mass of 5,700 kg or less and authorised to carry more than five but not more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings excessive descent rate and excessive altitude loss after take-off or go-around, warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

(4) All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in excessive descent rate and excessive altitude loss after take-off or go-around, warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

(5) A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

(6) A ground proximity warning system shall provide, unless otherwise specified in these Regulations, warnings of the following circumstances—

- (a) excessive descent rate;
- (b) excessive terrain closure rate;
- (c) excessive altitude loss after take-off or go-around;

- (d) unsafe terrain clearance while not in landing configuration where—
 - (i) gear not locked down; and
 - (ii) flaps not in a landing position;
- (e) excessive descent below the instrument glide path.

63. Aeroplanes carrying passengers -cabin crew seats

(1) An operator shall not operate an aeroplane unless it is equipped with a forward or rearward facing seat, within 15 degrees of the longitudinal axis of the aeroplane, fitted with a safety harness for the use of each cabin crew member required to comply with the Civil Aviation (Operation of Aircraft – Commercial Air Transport Aeroplanes) Regulation in respect of emergency evacuation.

(2) Cabin crew seats provided in accordance with sub-regulation (1) shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.

64. Emergency locator transmitter or ELT

(1) An operator shall not operate an aeroplane unless it carries an automatic ELT operating on 121.5 MHz and 406 MHz.

(2) Except as provided for in subregulation (3), an operator shall not operate an aeroplane authorised to carry more than 19 passengers unless it is equipped with at least one automatic ELT or two ELTs of any type.

(3) All aeroplanes authorised to carry more than 19 passengers for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with either—

- (a) at least two ELTs, one of which shall be automatic; or
- (b) at least one ELT and a capability that meets the requirements of this regulation.

(4) Except as provided for in subregulation (5), all aeroplanes authorised to carry 19 passengers or less shall be equipped with at least one ELT of any type.

(5) All aeroplanes authorised to carry 19 passengers or less for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least one automatic ELT.

(6) ELT equipment carried in accordance with this regulation shall operate in compliance with the Civil Aviation (Aeronautical Communication Systems) Regulations, 2022.

65. Location of aeroplane in distress

(1) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which the individual certificate of airworthiness is first issued on or after 1st January 2023, shall autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress, in accordance with the Regulations applicable to location of aircraft in distress.

(2) The operator shall make position information of a flight in distress available to the appropriate organizations, as established by the State of the Operator.

66. Aeroplanes required to be equipped with airborne collision avoidance system or ACAS II

(1) An operator shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than 19 passengers unless it is equipped with an airborne collision avoidance system.

(2) An airborne collision avoidance system shall operate in accordance with the relevant provisions of the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

67. Requirements for pressure-altitude reporting transponders

(1) An operator shall not operate an aeroplane unless it is equipped with a pressure-altitude reporting transponder, which operates in accordance with the relevant provisions of the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

(2) All aeroplanes for which the individual certificate of airworthiness is first issued after 1st January, 2009 shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m (25 ft), or better.

(3) All aeroplanes shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m or 25 ft, or better.

(4) The Mode S transponder shall be provided with the airborne on-the-ground status if the aeroplane is equipped with an automatic means of detecting such status.

68. Microphones

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones below the transition level or altitude.

69. Turbo-jet aeroplanes — forward-looking wind shear warning system

(1) An operator shall not operate a turbo-jet aeroplane of a maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than 9 passengers unless it is equipped with a forward-looking wind shear warning system.

(2) A forward-looking wind shear warning system shall be capable of providing the pilot with a timely aural and visual warning of wind shear ahead of the aircraft, and the information required to permit the pilot to safely commence and continue a missed approach or go-around or to execute an escape manoeuvre when necessary.

(3) Subject to subregulation (2), the system shall also provide

an indication to the pilot when the limits specified for the certification of automatic landing equipment are being approached, when such equipment is in use.

70. All aeroplanes operated by a single pilot under IFR or at night

For approval in accordance with the Civil Aviation (Operation of Aircraft – Commercial Air Transport Aeroplanes) Regulations, 2022, all aeroplanes operated by a single pilot under the IFR or at night shall be equipped with—

- (a) a serviceable autopilot that has at least altitude hold and heading select modes;
- (b) a headset with a boom microphone, transmit button on the control wheel or equivalent; and
- (c) means of displaying charts that enables them to be readable in all ambient light conditions.

71. Aeroplanes equipped with automatic landing systems, a head-up display or HUD or equivalent displays, enhanced vision systems or EVS, synthetic vision systems or SVS or combined vision systems or CVS

(1) Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the State of the Operator.

(2) The authority shall not approve the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, unless the operator—

- (a) ensures that the equipment meets the appropriate airworthiness certification requirements;
- (b) has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or

equivalent displays, EVS, SVS or CVS; and

- (c) has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

72. Electronic Flight Bag- equipment

Where portable EFBs are used on board an aeroplane, the operator shall ensure that they do not affect the performance of the aeroplane systems, equipment or the ability to operate the aeroplane.

73. Electronic Flight Bag Functions

(1) Where EFBs are used on board an aeroplane, the operator shall—

- (a) assess the safety risks associated with each EFB function;
- (b) establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and
- (c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

(2) The authority shall issue a specific approval for the operational use of EFB functions to be used for the safe operation of aeroplanes.

74. Electronic Flight Bag specific approval

(1) An operator shall not operate an EFB on board an aeroplane unless the EFB is issued a specific approval by the State of the Operator in accordance with the appropriate airworthiness requirements and the criteria for the safe operation of the aeroplane.

(2) Subject to subregulation (1), in meeting the criteria for the safe operation of the aeroplane, the operator shall-

- (a) assess the EFB equipment and its associated installation hardware, including interaction with aeroplane systems

where applicable, meet the appropriate airworthiness certification requirements;

- (b) assess the safety risks associated with the operations supported by the EFB functions;
- (c) establish requirements for redundancy of the information where appropriate as contained in and displayed by the EFB functions;
- (d) establish and document procedures for the management of the EFB functions including any database it may use; and
- (e) establish and document the procedures for the use of, and training requirements for, the EFB and the EFB function.

Aeroplane Communication, Navigation and Surveillance Equipment

75. Communication equipment

(1) An aeroplane shall be provided with radio communication equipment capable of—

- (a) conducting two-way communication for aerodrome control purposes;
- (b) receiving meteorological information at any time during flight; and
- (c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by Uganda Communication Commission.

(2) The requirements of subregulation (1) are considered fulfilled if the ability to conduct the communications specified in subregulation (1) is established during radio propagation conditions, which are normal for the route.

(3) The radio communication equipment required in accordance with subregulation (1) shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

(4) For operations where communication equipment is required to meet specified communication performance or RCP specification for performance-based communication or PBC, an aeroplane shall, in addition to the requirements specified in subregulation (1)—

- (a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specifications;
- (b) have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or State of Registry; and
- (c) have information relevant to the aeroplane RCP specification capabilities included in the MEL.

(5) The authority shall, for operations where an RCP specification for PBC has been prescribed, ensure that the operator has established and documented—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(6) The authority shall ensure that, in respect of the aeroplane referred to in subregulation (4), adequate provisions exist for—

- (a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services)

Regulations, 2022; and

- (b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specifications.

76. Navigation equipment

(1) An aeroplane shall be provided with navigation equipment which will enable it to proceed—

- (a) in accordance with its operational flight plan;
- (b) in accordance with the requirements of air traffic services; except when, if not so precluded by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to landmarks.

(2) The aeroplane shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with this regulation.

77. Performance-based navigation (PBN)

(1) An operator shall not operate an aeroplane where a navigation specification for PBN has been prescribed, unless the aeroplane in addition to the requirements specified in subregulation (2)—

- (a) is provided with navigation equipment which enables it to operate in accordance with the prescribed navigation specifications;
- (b) has information relevant to the aeroplane navigation specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of the Design or State of Registry; and
- (c) has information relevant to the aeroplane navigation specification capabilities included in the MEL.

(2) Prior to the authority issuing a specific approval for PBN, the Operator shall, for operations where a navigation specification for PBN has been prescribed, establish and document—

- (a) normal and abnormal procedures including contingency procedures;
- (b) flight crew qualification and proficiency requirements in accordance with the appropriate navigation specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness in accordance with the appropriate navigation specifications.

(3) The authority shall issue a specific approval for operations based on PBN authorisation required or AR navigation specifications.

78. Minimum navigation performance specifications (MNPS)

An operator shall not operate an aeroplane for flights in defined portions of airspace where, based on regional air navigation agreement, MNPS are prescribed, unless the aeroplane is provided with navigation equipment which—

- (a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and
- (b) has been authorised by the authority for the MNPS operations concerned.

79. Reduced vertical separation minimum (RVSM)

(1) An operator shall not operate an aeroplane for flights in defined portions of airspace where, based on regional air navigation agreement, an RVSM of 300 m or 1 000 ft is applied between FL 290 and FL 410 inclusive unless—

- (a) the aeroplane is provided with equipment which is capable

of—

- (i) indicating to the flight crew the flight level being flown;
 - (ii) automatically maintaining a selected flight level;
 - (iii) providing an alert to the flight crew when a deviation occurs from the selected flight level and the threshold for the alert shall not exceed ± 90 m or 300 ft; and
 - (iv) automatically reporting pressure-altitude; and
- (b) the authority shall issue a specific approval for RVSM operations.

(2) An operator shall ensure that aeroplanes operated in RVSM airspace in addition to complying with the requirements of these Regulations shall be equipped with the following—

- (a) two independent altitude measurement system;
- (b) an altitude altering system;
- (c) an automatic altitude control system; and
- (d) secondary surveillance radar (SSR) transponder system that can be connected to the altitude measurement system in the use for altitude keeping.

(3) Prior to granting the RVSM specific approval required in accordance with subregulation (1), the authority shall be satisfied that—

- (a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Schedule 4 of these Regulations;
- (b) the operator has instituted appropriate procedures in respect of continued airworthiness for maintenance and repair practices and programmes; and
- (c) the operator has instituted appropriate flight crew

procedures for operations in RVSM airspace.

(4) An RVSM specific approval is valid globally on the understanding that any operating procedures specific to a given region shall be stated in the operations manual or appropriate crew guidance.

(5) The State of the Operator, in consultation with the State of Registry where appropriate, shall ensure that, in respect of the aeroplane referred to in subregulation (1), adequate provisions exist for—

- (a) receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and
- (b) taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operation in airspace where RVSM is applied.

(6) The State of the Operator that has issued an RVSM specific approval to an operator shall establish a requirement which ensures that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer.

(7) Where the operator of the aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

(8) Subject to subregulation (7), monitoring data from any regional monitoring programme established in accordance with ICAO Annex 11, may be used to satisfy these requirements.

(9) The authority shall take appropriate action with respect to aircraft and operators for which it has regulatory oversight

responsibility is found to be operating in RVSM airspace in Uganda or another State without a valid RVSM specific approval.

(10) The separation requirements within RVSM airspace (between FL 290 and FL 410 inclusive) for the verticle separation minimum are—

- (a) 1,000 ft (300m) between RVSM approved aircraft;
- (b) 2,000 ft (600m) between non-RVSM approved state aircraft and other aircraft operating within RVSM airspace;
- (c) 2,000 ft (600m) between non-RVSM aircraft operating as general air traffic (GAT) and any other aircraft within RVSM airspace.

(11) On flights in which it is intended to land in instrument meteorological conditions (IMC), an aeroplane shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be effected.

(12) The equipment referred to in subregulation (11), shall be capable of providing such guidance for each aerodrome at which it is intended to land in instrument meteorological conditions and for any designated alternate aerodromes.

80. Surveillance equipment

(1) An operator shall not operate an aeroplane unless it is provided with surveillance equipment, which will enable it to operate in accordance with the requirements of air traffic services.

(2) For operations where surveillance equipment is required to meet required surveillance performance (RSP) specification for performance-based surveillance (PBS), an aeroplane shall, in addition to the requirements specified in subregulation (1)—

- (a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specifications;

- (b) have information relevant to the aeroplane RSP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or State of Registry; and
 - (c) have information relevant to the aeroplane RSP specification capabilities included in the MEL.
- (3) Where an RSP specification for PBS has been prescribed, the operator shall establish and document—
- (a) normal and abnormal procedures, including contingency procedures;
 - (b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
 - (c) a training programme for relevant personnel consistent with the intended operations; and
 - (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.
- (4) The operator shall ensure that, in respect of the aeroplanes referred to in subregulation (2), adequate provisions exist for—
- (a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and
 - (b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specifications.

81. Installation

The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof shall not result in the failure of another

unit required for communication, navigation or surveillance purposes.

82. Electronic navigation data management

(1) An operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the State of the Operator has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment.

(2) Subject to subregulation (1), the operator shall continue to monitor both the process and products.

(3) The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft as appropriate.

PART IV— GENERAL AVIATION — AEROPLANES (GENERAL AVIATION OPERATIONS)

Aeroplane Instruments, Equipment and Flight Documents

83. Aeroplanes for general aviation operations-applicability

This Part provides for aircraft instruments, equipment and flight documents requirements for all aeroplanes for general aviation operations.

84. General

(1) In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, an aeroplane shall not fly unless the instruments, equipment and flight documents prescribed in these Regulations are installed or carried, as appropriate, in aeroplanes according to the aeroplane used and to the circumstances under which the flight is to be conducted.

(2) The prescribed instruments and equipment, including their installation, shall be acceptable to the authority.

85. Aeroplanes on all flights

(1) An aeroplane shall be equipped with instruments which will enable the flight crew to control the flight path of the aeroplane, carry out any required procedural manoeuvres and observe the operating limitations of the aeroplane in the expected operating conditions.

- (2) An aeroplane shall be equipped with or carry on board—
- (a) an accessible first-aid kit;
 - (b) portable fire extinguishers of a type which, when discharged, shall not cause dangerous contamination of the air within the aeroplane and at least one shall be located in—
 - (i) the pilot's compartment; and
 - (ii) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.
 - (c) a seat or berth for each person over 2 years of age;
 - (d) a seat belt for each seat and restraining belts for each berth;
 - (e) the following manuals, charts and information-
 - (i) the flight manual or other documents or information concerning any operating limitations prescribed for the aeroplane by the authority, required for the application of aeroplane performance operating limitations in accordance with the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022
 - (ii) any specific approval issued by the authority, where applicable, for the operations to be conducted;
 - (iii) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;

- (iv) procedures in accordance with the Civil Aviation (Rules of the Air) Regulations, 2020 for pilots-in-command of intercepted aircraft;
 - (v) visual signals for use by intercepting and intercepted aircraft in accordance with the Civil Aviation (Rules of the Air) Regulations, 2020; and
 - (vi) the journey log book for the aeroplane;
- (f) spare electrical fuses of appropriate ratings where the aeroplane is fitted with fuses that are accessible in flight, for replacement of those fuses.

(3) Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31st December 2011 and any extinguishing agent used in a portable fire extinguisher in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31st December 2018 shall—

- (a) meet the applicable minimum performance requirements of the State of Registry; and
- (b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex A, Group II.

(4) Aeroplanes on all flights shall be equipped with the ground air signal codes for search and rescue purposes.

(5) All aeroplanes on all flights shall be equipped with a safety harness for each flight crewmember seat.

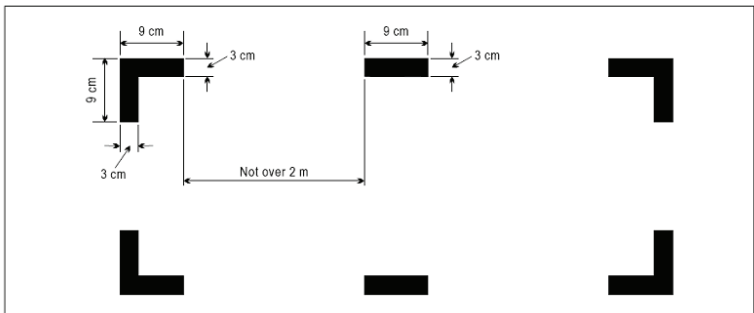
86. Marking of break-in points

(1) Where areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on an aeroplane, such areas shall be marked as shown in Figure 2 below.

(2) The colour of the markings shall be red or yellow, and where necessary shall be outlined in white to contrast with the background.

(3) Where the corner markings are more than 2m apart, intermediate lines 9cm × 3cm shall be inserted so that there is no more than 2m between adjacent markings.

Figure 2. Marking of break-in points



87.

All aeroplanes operated as Visual Flight Rule (VFR) Flights

(1) All aeroplanes operated as VFR flights shall be—

- (a) equipped with a means of measuring and displaying—
 - (i) magnetic heading;
 - (ii) barometric altitude; and
 - (iii) indicated airspeed;
- (b) equipped with, or shall carry, a means of measuring and displaying time in hours, minutes and seconds; and
- (c) equipped with such additional equipment as may be prescribed by the authority.

(2) VFR flights which are operated as controlled flights shall be equipped in accordance with Instrument Flight Rules.

88. Aeroplanes on flights over water - seaplanes

(1) An operator shall not operate a seaplane for any flight over

water unless it is equipped with—

- (a) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position readily accessible from the seat or berth;
- (b) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable;
- (c) one anchor; and
- (d) one sea anchor (drogue), when necessary to assist in manoeuvring.

(2) For purposes of subregulation (1), “seaplanes” includes amphibians operated as seaplanes.

89. Single engine landplanes

(1) An operator shall not operate a single-engined landplane unless it carries one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided—

- (a) when flying en route over water beyond gliding distance from the shore; or
- (b) when taking off or landing at an aerodrome where, in the opinion of the pilot-in-command, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.

(2) For purposes of subregulation (1), “landplanes” includes amphibians operated as landplanes.

90. Aeroplanes on extended flights over water

(1) An operator shall not operate an aeroplane on extended flights over water unless it is equipped with, at a minimum, one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of

the person for whose use it is provided.

(2) The pilot-in-command of an aeroplane operated on an extended flight over water shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching.

(3) The pilot-in-command shall take into account the operating environment and conditions including—

- (a) sea state and sea and air temperatures;
- (b) the distance from land suitable for making an emergency landing; and
- (c) the availability of search and rescue facilities.

(4) Based upon the assessment of the risks, the pilot-in-command shall, in addition to the equipment required in subregulation (1), ensure that the aeroplane is equipped with—

- (a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and
- (b) equipment for making the distress signals described in the Civil Aviation (Rules of the Air) Regulations, 2020

91. Aeroplanes on flights over designated land areas

An operator shall not operate an aeroplane, across land areas which have been designated by the state concerned as areas in which search and rescue would be especially difficult, unless it is equipped with such signalling devices and life-saving equipment, including means of sustaining life as may be appropriate to the area overflown.

92. Aeroplanes on high altitude flights

(1) An operator shall not operate an aeroplane at high altitudes unless it is equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required

under the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

(2) An operator shall not operate a pressurized aeroplane at flight altitudes at which the atmospheric pressure is less than 376 hPa unless it is equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

93. All aeroplanes operated in accordance with Instrument Flight Rule

(1) All aeroplanes when operated in accordance with the instrument flight rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be—

- (a) equipped with a means of measuring and displaying—
 - (i) magnetic heading or standby compass;
 - (ii) barometric altitude;
 - (iii) indicated airspeed, with a means of preventing malfunctioning due to either condensation or icing;
 - (iv) turn and slip;
 - (v) aircraft attitude;
 - (vi) stabilized aircraft heading;
 - (vii) whether the supply of power to the gyroscopic instruments is adequate;
 - (viii) the outside air temperature; and
 - (ix) rate-of-climb and descent;
 - (b) equipped with, or shall carry, a means of measuring and displaying time in hours, minutes and seconds; and
 - (c) equipped with such additional instruments or equipment as may be prescribed by the authority.
- (2) The requirements of subregulation (1) (a) (iv), (v) and (vi)

may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the three separate instruments, are retained.

94. Aeroplanes when operated at night

An operator shall not operate an aeroplane at night unless it is equipped with—

- (a) the equipment specified in regulation 93;
- (b) the lights required by the Civil Aviation (Rules of the Air) Regulations, 2020 and the Schedule 5 to these Regulations, for aircraft in flight or operating on the movement area of an aerodrome and the general characteristics of which are specified in Schedule 5 of these Regulations;
- (c) a landing light;
- (d) illumination for all flight instruments and equipment that are essential for the safe operation of the aeroplane that are used by the flight crew;
- (e) lights in all passenger compartments; and
- (f) an independent portable light for each crew member station.

95. Document attesting noise certification

(1) An operator of an aeroplane shall carry a document attesting noise certification in accordance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) The attestation in subregulation (1), may be contained in any document, carried on board, and approved by the State of Registry.

96. Mach number indicator

An operator shall not operate an aeroplane with speed limitations expressed in terms of Mach number unless it is equipped with a means of displaying Mach number.

97. Aeroplanes required to be equipped with ground proximity warning systems (GPWS)

(1) An operator shall not operate an all turbine-engined aeroplane of a maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than nine passengers unless it is equipped with a ground proximity warning system, which has a forward-looking terrain avoidance function.

(2) An operator shall not operate an all turbine-engined aeroplane of a maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than five passengers but not more than nine passengers unless it is equipped with a ground proximity warning system, which has a forward-looking terrain avoidance function.

(3) An operator shall not operate of a piston engine aeroplane of maximum certificated take-off mass in excess of 5,700 kg or authorised to carry more than nine passengers unless it is equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

(4) A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

(5) A ground proximity warning system shall provide, at a minimum, warnings of at least the following circumstances—

- (a) excessive descent rate;
- (b) excessive altitude loss after take-off or go-around; and
- (a) unsafe terrain clearance while not in landing configuration;
- (b) gear not locked down;
- (c) flaps not in a landing position; and
- (d) excessive descent below the instrument glide path.

(6) A ground proximity warning system installed in turbine-engined aeroplanes of a maximum certificated take-off mass in excess

of 5,700 kg or authorised to carry more than nine passengers for which the individual certificate of airworthiness is first issued after 1st January, 2011 shall provide, as a minimum, warnings of at least the following circumstances—

- (a) excessive descent rate;
- (b) excessive terrain closure rate;
- (c) excessive altitude loss after take-off or go-around;
- (d) unsafe terrain clearance while not in landing configuration;
- (e) gear not locked down;
- (f) flaps not in a landing position; and
- (g) excessive descent below the instrument glide path.

98. Emergency Locator Transmitter or ELT

(1) An operator shall not operate an aeroplane unless it carries an automatic ELT.

(2) Except as provided for in subregulation (3) and (4), all aeroplanes shall be equipped with at least one ELT of any type.

(3) All aeroplanes for which the individual certificate of airworthiness is first issued after 1st July, 2008 shall be equipped with at least one automatic ELT.

(4) ELT equipment carried to satisfy the requirements of this regulation shall operate in accordance with the Civil Aviation (Aeronautical Communication Systems) Regulations, 2022.

99. Aeroplanes required to be equipped with pressure altitude reporting transponder

(1) An operator shall not operate an aeroplane unless it is equipped with a pressure-altitude reporting transponder, which operates in accordance with the relevant provisions of the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

(2) Subject to subregulation (1) unless exempted by the authority, aeroplanes operating as VFR flights shall be equipped with a

pressure-altitude reporting transponder which operates in accordance with the relevant provision of the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

100. Microphones

When operating under IFR, all flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones below the transition level or altitude.

101. Aeroplanes equipped with automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS.

(1) Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the criteria for the use of such systems for the safe operation of an aeroplane shall be approved by the State of Registry.

(2) In establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the operator shall ensure that-

- (a) the equipment meets the appropriate airworthiness certification requirements;
- (b) he or she conducts a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS; and
- (c) he or she establishes and documents the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

102. Flight recorders

(1) Crash-protected flight recorders shall comprise one or more of the following—

- (a) a flight data recorder or FDR;
- (b) a cockpit voice recorder or CVR;

- (c) an airborne image recorder or AIR; and
- (d) a data link recorder or DLR.

(2) Image and data link information relating to crash protected flight recorders shall be recorded on either the CVR or FDR in accordance with Schedule 6 to these Regulations.

(3) Lightweight flight recorders comprise one or more of the following—

- (a) an aircraft data recording system;
- (b) a cockpit audio recording system;
- (c) an airborne image recording system or AIRS; and
- (d) a data link recording system.

(4) Image and data link information related to lightweight flight recorders shall be recorded on either the CARS or the ADRS in accordance with Schedule 6 to these Regulations.

(5) Detailed requirements on flight recorders and parameters to be recorded are provided in the Schedule 6 to these Regulations.

103. FDR and ADRS – applicability

(1) An operator shall not operate a turbine-engined aeroplane with a seating configuration of more than five passenger seats and a maximum certificated take-off mass of 5,700 kg or less for which the individual certificate of airworthiness is first issued on or after 1st January, 2016 unless it is equipped with—

- (a) an FDR which shall record at least the first 16 parameters in table A2.3-1 of Schedule 6 to these Regulations; or
- (b) a class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s) as defined in paragraph 2.2(2) of Schedule 6 to these Regulations; or
- (c) an ADRS which shall record at least the first 7 parameters

listed in table A2-3.3 in Schedule 6 to these Regulations.

(2) All aeroplanes of a maximum certificated take-off mass of over 5,700kg for which the application for type certification is submitted to a Contracting State on or after 1st January, 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in table A2.3-1 to Schedule 6 to these Regulations.

(3) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which the individual certificate of airworthiness is first issued on or after 1st January, 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in table A2.3-1 to Schedule 6 to these Regulations.

104. FDR and ADRS – recording technology

An operator of an aeroplane shall not use engraving metal foil, frequency modulation, photographic film or magnetic tape on flight data recorders or aircraft data recording systems or airborne image recording systems.

105. FDR and ADRS -duration

An operator shall use FDRs that retains the information recorded during at least the last 25 hours of their operation.

106. CVR and CARS–applicability

An operator shall not operate a turbine-engined aeroplane with a seating configuration of more than 5 passenger seats and a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness was first issued on or after 1 January 2016 and required to be operated by more than one pilot unless it is equipped with either a CVR or a CARS.

107. CVR and CARS –recording technology

An operator of an aeroplane shall not use magnetic tape or wire on CVR and CARS

108. CVR and CARS -duration

(1) An operator shall ensure that the CVRs retain the information recorded during at least the last 2 hours of their operation.

(2) An operator shall not operate an aeroplane that is required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1st January 2025, unless it is equipped with a CARS which shall retain the information recorded during at least the last two hours of their operation.

109. Data link recorders – applicability

(1) An operator shall not operate an aeroplane for which the individual certificate of airworthiness is first issued on or after 1st January, 2016, which use any of the data link communications applications referred to in paragraph 5.1(2) of Schedule 6 to these Regulations and are required to carry a CVR, unless it records the data link communications messages on a crash-protected flight recorder.

(2) All aeroplanes for which the individual certificate of airworthiness was first issued before 1st January, 2016, that are required to carry a CVR and are modified on or after 1st January, 2016 to install and use any of the data link communications applications referred to in paragraph 5.1(2) of Schedule 6 to these Regulations shall record the data link communications messages on a crash-protected flight recorder unless the installed data link communications equipment is compliant with the type certificate issued or aircraft modification first approved prior to 1st January, 2016.

(3) A class B AIR may be used as a means for recording data link communications applications messages to and from the aeroplanes where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

(4) All aeroplanes for which the individual certificate of airworthiness was first issued before 1st January, 2016, that are required to carry a CVR and are modified on or after 1st January, 2016 to use any of the data link communications applications referred to in paragraph 5.1(2) to Schedule 6 to these Regulations shall record the data link communications messages on a crash-protected flight recorder.

110. Data link recorders – duration

The minimum recording duration shall be equal to the duration of the

CVR.

111. Data link recorders – correlation

Data link recording shall allow correlation with the recorded cockpit audio.

112. Flight recorders — general

(1) Flight recorders shall be constructed, located and installed—

(a) to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed;

(b) to meet the prescribed crashworthiness and fire protection specifications.

(2) Flight recorders shall—

(a) not be switched off during flight time;

(b) be deactivated upon completion of flight time following an accident or incident in order to preserve flight recorder records.

(3) The flight recorders shall not be reactivated before their disposition as determined in accordance with the Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

(4) The need for removal of the flight recorder records from the aircraft shall be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

(5) The responsibilities of the pilot-in-command regarding the retention of flight recorder records are contained in regulation 113.

113. Flight recorder records

The pilot-in-command or the owner or the operator, shall ensure that in the event the aeroplane becomes involved in an accident or incident, all related flight recorder records, and where necessary the associated

flight recorders are preserved and retained in safe custody pending their disposition in accordance with the Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2022.

114. Continued serviceability

(1) Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

(2) Procedures for the inspections of the flight recorder systems shall be in accordance with Schedule 6 to these Regulations.

115. Flight recorder electronic documentation

(1) The documentation requirement concerning FDR and ADRS parameters provided by operators to accident investigation authorities should be in electronic format and takes account of industry specifications.

(2) The industry specifications concerning flight recorder parameters referred to in subregulation (1) maybe found in ARINC 647A, flight recorder electronic documentation or equivalent.

116. EFB - equipment

Where portable EFBs are used on board an aeroplane, the pilot-in-command or the operator or the owner shall ensure that they do not affect the performance of the aeroplane systems, equipment or the ability to operate the aeroplane.

117. EFB - functions

(1) Where EFB is used on board the aeroplane, the operator or pilot-in-command shall—

- (a) assess the safety risks associated with each EFB function;
- (b) establish the procedures for the use of, and training requirements for, the device and each EFB function; and
- (c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the

flight to be conducted safely.

(2) The authority shall issue a specific approval for the operational use of EFB functions used for the safe operation of aeroplanes.

118. EFB specific approval

Prior to the authority issuing a specific approval for the use of EFBs, the Owner or Operator shall—

- (a) meet the appropriate airworthiness certification requirements for the EFB equipment and its associated installation hardware, including interaction with aeroplane systems where applicable,
- (b) shall assess the risks associated with the operations supported by the EFB functions;
- (c) establish requirements for redundancy of the information, if appropriate, contained in and displayed by the EFB functions;
- (d) establish and document procedures for the management of the EFB functions including any databases that may be used; and
- (e) establish and document the procedures for the use of, and training requirements for, the EFB functions.

119. Aeroplane operated under Article 83 bis agreement

(1) An operator shall not operate an aeroplane, under an Article 83 bis agreement entered into between the State of Registry and the State of the principal location of a general aviation operator, unless it carries a certified true copy of the agreement summary, in either an electronic or hard copy format.

(2) When the agreement summary specified in subregulation (1) is issued in a language other than English, an English translation

shall be included.

(3) The agreement summary of the Article 83 bis agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred under the agreement by the State of Registry to the State of a principle location of a general aviation operator, when conducting surveillance activities such as ramp checks.

(4) The agreement summary shall be transmitted to ICAO together with the Article 83 bis Agreement for registration with the ICAO Council by the State of Registry or the State of the principal location of a general aviation operator.

(5) The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council shall contain the list of all aircraft affected by the agreement while the certified true copy required to be carried on board as required in subregulation (1) shall list only the specific aircraft carrying the copy.

(6) The agreement summary shall contain the information for the specific aircraft and shall follow the layout provided in Schedule 7 of these Regulations.

Aeroplane Communication, Navigation and Surveillance Equipment

120. Communication equipment

(1) An operator shall not operate an aeroplane operated in accordance with the instrument flight rules or at night unless it is provided with radio communication equipment.

(2) Subject to subregulation (1), the communication equipment shall be capable of conducting two-way communication with the aeronautical stations and on the frequencies prescribed by the Uganda Communication Commission.

(3) Where more than one communication equipment unit is provided, each shall be independent of the other or others to the extent

that a failure in anyone will not result in failure of any other.

(4) An aeroplane to be operated in accordance with VFR, but as a controlled flight, shall, unless exempted by the authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the authority in the aeronautical information publications.

(5) An aeroplane to be operated on a flight to which the provisions of regulations 90 or 91 apply, unless exempted by the authority, shall be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the authority in the aeronautical information publications.

(6) The radio communication equipment required in accordance with these Regulations shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

(7) For operations where communication equipment is required to meet a required communication performance or RCP specification for performance based communication or PBC, an aeroplane shall, in addition to the requirements specified in this regulation-

- (a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specifications;
 - (b) have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or State of Registry; and
 - (c) where the aeroplane is operated in accordance with a MEL, have information relevant to the aeroplane RCP specification capabilities included in the MEL.
- (8) The authority shall establish criteria for operations where

an RCP specification for PBC has been prescribed.

(9) In establishing criteria for operations where an RCP specification for PBC has been prescribed, the operator or owner shall establish—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with the appropriate RCP specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(10) The authority shall ensure that, in respect of subregulation (8), adequate provisions exist for—

- (a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2020; and
- (b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specifications.

121. Navigation equipment

(1) An operator shall not operate an aeroplane unless it is provided with navigation equipment which will enable it to proceed in accordance with—

- (a) its flight plan; and
- (b) the requirements of air traffic services; except when, if not so precluded by the authority, navigation for flights under VFR is accomplished by visual reference to

landmarks.

(2) The aeroplane shall be provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with these Regulations.

122. Performance-based navigation

(1) For operations where a navigation specification for PBN has been prescribed, an aeroplane shall, in addition to the requirements specified in regulation 121—

- (a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specifications;
- (b) have information relevant to the aeroplane navigation specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or State of Registry; and
- (c) where the aeroplane is operated in accordance with a MEL, have information relevant to the aeroplane navigation specification capabilities included in the MEL.

(2) The authority shall establish criteria for operations where a navigation specification for PBN has been prescribed.

(3) In establishing criteria for operations where a navigation specification for PBN has been prescribed, the operator or owner shall establish—

- (a) normal and abnormal procedures including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications;
- (c) training for relevant personnel consistent with the

intended operations; and

- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with the appropriate navigation specifications.

(4) The authority shall issue a specific approval for operations based on PBN authorisation required or AR navigation specifications.

123. Minimum navigation performance specifications

For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, MNPS are prescribed, an aeroplane shall be provided with navigation equipment which—

- (a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and
- (b) has been authorised by the State of Registry for the MNPS operations concerned.

124. Reduced vertical separation minimum (RVSM)

(1) For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, an RVSM of 300 m or 1 000 ft is applied between FL 290 and FL 410 inclusive—

- (a) the aeroplane shall be provided with equipment which is capable of—
 - (i) indicating to the flight crew the flight level being flown;
 - (ii) automatically maintaining a selected flight level;
 - (iii) providing an alert to the flight crew when a deviation occurs from the selected flight level and the threshold for the alert shall not exceed ± 90 m or 300 ft; and
 - (iv) automatically reporting pressure altitude;

(b) the State of Registry shall issue a specific approval for RVSM operations.

(2) Prior to the authority granting the RVSM specific approval required in accordance with subregulation (1) (b), the owner or operator shall—

(a) ensure that the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Schedule 8 to these Regulations;

(b) institute the appropriate procedures in respect of continued airworthiness for maintenance and repair practices and programmes; and

(c) institute appropriate flight crew procedures for operations in RVSM airspace.

(3) An RVSM specific approval is valid globally on the understanding that any operating procedures specific to a given region shall be stated in the approved operations manual or appropriate crew guidance.

(4) The State of Registry shall ensure that, in respect of those aeroplanes mentioned in subregulation (1), adequate provisions exist for—

(a) receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and

(b) taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operation in airspace where RVSM is applied.

(5) For the authority to issue an RVSM specific approval an owner or operator shall ensure that a minimum of two aeroplanes of each aircraft type grouping have their height-keeping performance monitored, at least once every two years or within intervals of 1000

flight hours per aeroplane, whichever period is longer.

(6) Subject to subregulation (5), where an owner or operator of aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

(7) The authority shall take appropriate action as specified in Schedule 11 to these Regulations in respect of aircraft and owners or operators found to be operating in RVSM airspace without a valid RVSM specific approval.

(8) Subject to subregulation (7) action shall be taken where—

(a) the aircraft in question is of foreign or Uganda registered found was operating without a specific approval in the airspace of Uganda; and

(b) an owner or operator for which Uganda has regulatory oversight responsibility is found to be operating without the required specific approval in the airspace of another State.

(9) The aeroplane shall be provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with these Regulations.

125. Instrument Meteorological Conditions (IMC)

(1) An operator or owner shall not operate an aeroplane on a flight in which it is intended to land in IMC, unless the aeroplane is provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be effected.

(2) The equipment specified in subregulation (1) shall be capable of providing such guidance for each aerodrome at which it is intended to land in IMC and for any designated alternate aerodromes.

126. Surveillance equipment

(1) An owner or operator shall not operate an aeroplane unless it is provided with surveillance equipment, which shall enable it to

operate in accordance with the requirements of air traffic services.

(2) For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance, an aeroplane shall, in addition to the requirements specified in subregulation (1)—

- (a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specifications;
- (b) have information relevant to the aeroplane RSP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or the State of Registry; and
- (c) where the aeroplane is operated in accordance with a MEL, have information relevant to the aeroplane RSP specification capabilities included in the MEL.

(3) The authority shall establish criteria for operations where an RSP specification for PBS has been prescribed.

(4) In establishing criteria for operations where an RSP specification for PBS has been prescribed, the operator or owner shall establish—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

(5) The authority shall ensure that, in respect of the aeroplanes mentioned in subregulation (2), adequate provisions exist for—

- (a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and
- (b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specifications.

PART V-GENERAL AVIATION — AEROPLANES
(LARGE AND TURBOJET AEROPLANES)

Aeroplane Instruments, Equipment and Flight Documents

127. Large aeroplanes and turbojet aeroplanes for general aviation operation-applicability

(1) This Part provides for aircraft instruments, equipment and flight documents requirements for large and turbojet aeroplanes for general aviation operations.

(2) This Part also applies to general aviation-large and turbojet aeroplanes—

- (a) with a maximum certificated take-off mass exceeding 5 700 kg;
- (b) equipped with one or more turbojet engines; and
- (c) operation involving an aeroplane with a seating configuration of more than 9 passenger seats.

128. General

(1) An operator or owner shall not operate an aeroplane with a maximum certificated take off mass above 5,700 kgs and turbo jet aeroplanes for general aviation unless it complies with all requirements specified in Part IV and V of the Civil Aviation (Operation of Aircraft)

(2) Where a master minimum equipment list is established for the aircraft type, the operator shall include in the operations manual a minimum equipment list approved by the State of Registry of the aeroplane which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

(3) The operator shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft.

(4) The operating manual shall be consistent with the aircraft flight manual or pilot's operating handbook and checklists to be used and its design shall observe human factors principles.

129. Aeroplanes on all flights

(1) In addition to the requirements contained in regulation 128 (2), an aeroplane shall be equipped with—

- (a) accessible and adequate medical supplies appropriate to the number of passengers the aeroplane is authorised to carry;
- (b) medical supplies shall comprise one or more first-aid kits;
- (c) a safety harness for each flight crew seat incorporating a device which shall automatically restrain the occupant's torso in the event of rapid deceleration;
- (d) the safety harness for each pilot seat shall incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls;
- (e) means of ensuring that the following information and instructions are conveyed to passengers—

- (i) when seat belts are to be fastened;
 - (ii) when and how oxygen equipment is to be used where the carriage of oxygen is required;
 - (iii) restrictions on smoking;
 - (iv) location and use of life jackets or equivalent individual flotation devices where their carriage is required;
 - (v) location of emergency equipment; and
 - (vi) location and method of opening emergency exits.
- (2) An operator or owner shall not operate an aeroplane unless it carries—
- (a) the operations manual as required by the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 or those parts of it that pertain to flight operations;
 - (b) the flight manual for the aeroplane, or other documents containing performance data required for the application of Aeroplane Performance Operating Limitations in accordance with the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness; and
 - (c) the checklists required by the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022.

130. Flight recorders

- (1) An operator or owner shall not—
 - (a) operate an aeroplane of a maximum certificated take-off mass of over 5,700kg for which the individual certificate of airworthiness was first issued on or after 1st January,

2005 unless it is equipped with an FDR which shall record at least 78 parameters listed in table A2.3-1 of Schedule 6 to these Regulations;

- (b) operate an aeroplane of a maximum certificated take-off mass of over 27,000kg for which the individual certificate of airworthiness is first issued on or after 1st January, 1989 unless it is equipped with an FDR which shall record at least 32 parameters listed in table A2.3-1 of Schedule 6 to these Regulations; and
- (c) operate an aeroplane of a maximum certificated take-off mass of over 5,700kg, up to and including 27,000kg, for which the individual certificate of airworthiness is first issued on or after 1st January, 1989, unless it is equipped with an FDR which shall record at least 16 parameters listed in table A2.3-1 of Schedule 6 to these Regulations.

131. Cockpit voice recorders

(1) An operator or owner shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass of over 5,700kg for which the application for type certification is submitted to a Contracting State on or after 1st January, 2016 and required to be operated by more than one pilot unless it is equipped with a CVR.

(2) An operator or owner shall not operate an aeroplane of a maximum certificated take-off mass of over 27,000kg for which the individual certificate of airworthiness is first issued on or after 1st January, 1987 unless it is equipped with a CVR.

(3) An operator or owner shall not operate an aeroplane of a maximum certificated take-off mass of over 5,700kg, up to and including 27,000 kg, for which the individual certificate of airworthiness is first issued on or after 1st January, 1987, unless it is equipped with a CVR.

(4) An operator or owner shall not operate an aeroplane of a maximum certificated take-off mass of over 27,000 kg for which the individual certificate of airworthiness is first issued on or after 1st

January, 2021 unless it is equipped with a CVR capable of retaining the information recorded during at least the last 25 hours of its operation.

132. Combination recorders

An operator or owner who operates an aeroplane of a maximum certificated take-off mass over 5,700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders, FDR/CVR.

133. Aeroplanes on long-range over-water flights

(1) An operator or owner shall not operate an aeroplane on an extended flight over water unless he or she has determined the risks to survival of the occupants of the aeroplane in the event of a ditching.

(2) An operator or owner shall not operate an aeroplane unless he or she has taken into account the operating environment and conditions, including, sea state, sea and air temperatures, the distance from land suitable for making an emergency landing, and the availability of search and rescue facilities.

(3) Subject to subregulation (2), based upon the assessment of the risks, an operator or owner shall not operate an aeroplane unless, in addition to the equipment required in regulation 90, ensure that the aeroplane is appropriately equipped with—

- (a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such lifesaving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and
- (b) equipment for making the distress signals described in the Civil Aviation (Rules of the Air) Regulations, 2020.

(4) Each life jacket and equivalent individual flotation device, when carried in accordance with regulation 90, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of regulation 90

is met by the provision of individual flotation devices other than life jackets.

134. Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1990

(1) An operator or owner shall not operate a pressurized aeroplane operated at flight altitudes at which the atmospheric pressure is less than 376 hPa unless it is equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

(2) An operator or owner shall not operate an aeroplane operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments unless it is equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

(3) An operator or owner shall not operate an aeroplane operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments unless it is provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

135. Aeroplanes in icing conditions

An operator or owner shall not operate an aeroplane unless it is equipped with suitable de-icing or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

136. Aeroplanes operated in accordance with the instrument flight rules

In addition to the requirements in regulation 93, an operator or owner shall not operate an aeroplane in accordance with the instrument flight

rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, unless it is equipped with two independent altitude measuring and display systems.

137. Aeroplanes over 5,700 kg — emergency power supply for electrically operated attitude indicating instruments

(1) An operator or owner shall not operate an aeroplane of a maximum certificated take-off mass of over 5,700kg unless it is fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument or artificial horizon, clearly visible to the pilot-in-command.

(2) The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicators are being operated by emergency power.

(3) An aeroplane with advanced cockpit automation systems, glass cockpits, shall have system redundancy that provides the flight crew with attitude, heading, air speed and altitude indications in case of failure of the primary system or display.

(4) Instruments that are used by any one pilot shall be so arranged as to permit the pilot to see their indications readily from his or her station, with the minimum practicable deviation from the position and line of vision normally assumed when looking forward along the flight path.

138. Pressurized aeroplanes when carrying passengers — weather-detecting equipment

An operator or owner shall not operate a pressurized aeroplane carrying passengers unless it is equipped with operative weather-detecting equipment capable of detecting thunderstorms whenever such aeroplane is being operated in areas where such conditions may be expected to exist along the route either at night or under instrument

meteorological conditions.

139. Aeroplanes operated above 15,000 m or 49,000 ft —radiation indicator

(1) An operator or owner shall not primarily operate an aeroplane above 15,000 m or 49,000 ft unless it carries an equipment to measure and indicate continuously the dose rate of total cosmic radiation being received, the total of ionizing and neutron radiation of galactic and solar origin and the cumulative dose on each flight.

(2) The display unit of the equipment shall be readily visible to a flight crewmember.

140. Aeroplanes carrying passengers — cabin crew seats

(1) An owner or operator shall not operate an aeroplane unless it is equipped with a forward or rearward facing seat, within 15 degrees of the longitudinal axis of the aeroplane, fitted with a safety harness for the use of each cabin crewmember in compliance with the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

in respect of emergency evacuation.

(2) Cabin crew seats provided in accordance with subregulation (1) shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.

141. Aeroplanes required to be equipped with an airborne collision avoidance system (ACAS)

(1) An operator or owner shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass in excess of 15,000kg, or authorised to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 24th November, 2005, unless it is equipped with ACAS II.

(2) An owner or operator shall not operate a turbine-engined aeroplane of a maximum certificated take-off mass in excess of 5,700kg but not exceeding 15,000kg, or authorised to carry more than

19 passengers, for which the individual airworthiness certificate is first issued after 1st January, 2008, unless it is equipped with ACAS II.

142. Aeroplanes required to be equipped with pressure-altitude reporting transponder

An owner or operator shall not operate an aeroplane unless it is equipped with a pressure-altitude reporting transponder which operates in accordance with the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

143. Microphones

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones below the transition level or altitude.

Aeroplane Communication, Navigation and Surveillance Equipment

144. Communication equipment

In addition to the requirements of the Civil Aviation Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

, an operator or owner shall not operate an aeroplane unless it is provided with radio communication equipment capable of—

- (a) conducting two-way communication for aerodrome control purposes;
- (b) receiving meteorological information at any time during flight; and
- (c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the Uganda Communication Commission.

145. Installation

An owner or operator shall not operate an aeroplane unless the equipment installation is such that the failure of any single unit

required for communications, navigation or surveillance purposes or any combination thereof shall not result in the failure of another unit required for communications, navigation or surveillance purposes.

146. Electronic navigation data management

(1) An operator or owner of an aeroplane shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the authority has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment.

(2) Subject to subregulation (1), the operator shall continue to monitor both the process and products.

(3) The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aeroplanes.

PART VI—HELICOPTER OPERATIONS – COMMERCIAL AIR TRANSPORT

Helicopter Instruments, Equipment and Flight Documents

147. Helicopters for both domestic and commercial air transport operations-applicability

This Part provides for aircraft instruments, equipment and flight documents requirements for helicopters for both domestic and commercial air transport operations.

148. General

(1) In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in these Regulations shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted.

(2) Subject to subregulation (1), the required instruments and

equipment, including their installation, shall be approved or accepted by the State of Registry.

149. Air operator certificate

(1) An operator shall not operate a helicopter for international flights unless it carries a certified true copy of the air operator certificate specified in the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 and a copy of the operations specifications relevant to the helicopter type, issued in conjunction with the certificate.

(2) When the certificate and the associated operations specifications are issued by the State of the Operator in a language other than English, an English translation shall be included.

150. Minimum Equipment List (MEL)

(1) The operator shall include in the operations manual a minimum equipment list, approved by the State of the Operator, which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

(2) Where the State of the Operator is not the State of Registry, the State of the Operator shall ensure that the MEL does not affect the helicopter's compliance with the airworthiness requirements applicable in the State of Registry.

151. Aircraft operating manual

(1) The operator shall make available to operations staff and crewmembers an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft.

(2) The manual shall include details of the aircraft systems and of the checklists to be used and the design of the manual shall observe human factors principles.

(3) The manual shall be easily accessible to the flight crew during all flight operations.

152. Helicopter operated under Article 83 bis agreement

(1) An operator shall not operate a helicopter, under Article 83 bis agreement entered into between the State of Registry and the State of the Operator, unless it carries a certified true copy of the agreement summary, in either an electronic or hard copy format.

(2) Where the agreement summary specified in subregulation (1) is issued in a language other than English, an English translation shall be included.

(3) The agreement summary of an Article 83 bis agreement shall be accessible to a civil aviation safety inspector in determining which functions and duties are transferred by the State of Registry to the State of the Operator under the agreement, when conducting surveillance activities such as ramp checks.

(4) The agreement summary shall be transmitted to ICAO together with Article 83 bis Agreement for registration with the ICAO Council by the State of Registry or the State of the Operator.

(5) The agreement summary shall contain the information for the specific helicopter and the layout specified in Part A of Schedule 9 to these Regulations.

(6) The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council shall contain the list of all aircraft affected by the agreement while the certified true copy required to be carried on board as required in subregulation (1) shall list only the specific aircraft carrying the copy.

153. All helicopters on all flights

An operator shall not operate a helicopter unless it is equipped with instruments that will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvres and observe the operating limitations of the helicopter in the expected operating conditions.

154. Medical supplies

(1) An operator shall not operate a helicopter unless it is

equipped with accessible and adequate medical supplies, which shall comprise—

- (a) a first-aid kit; and
- (b) for helicopters required to carry cabin crew as part of the operating crew, a universal precaution kit, for the use of cabin crew in managing incidents of ill health associated with a case of suspected communicable disease, or in the case of illness involving contact with body fluids.

(2) The type, number, location and content of the medical supplies comprising of first aids kit and universal precaution kit referred to in subregulation (1) shall be as specified in the applicable technical guidance materials.

155. Portable fire extinguishers

An operator shall not operate a helicopter unless it is equipped with portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter and at least located in—

- (a) the pilot's compartment; and
- (b) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

156. Seat, berth and seat belt or safety harness

(1) An operator shall not operate a helicopter unless it is equipped with—

- (a) a seat or berth for each person over two years of age and above;
- (b) a seat belt for each seat and restraining belts for each berth;
- (c) a safety harness for each flight crew seat; and
- (d) a safety harness for each pilot seat incorporating a device which shall automatically restrain the occupant's torso in the event of rapid deceleration.

(2) When dual controls are fitted, the safety harness for each pilot seat shall incorporate a restraining device to prevent the upper body of an incapacitated occupant from interfering with the flight controls.

157. Passenger information, signs and instructions

An operator shall not operate a helicopter unless it is equipped with means of ensuring that the following information and instructions are conveyed to passengers—

- (a) when seat belts or harnesses are to be fastened;
- (b) when and how oxygen equipment is to be used where the carriage of oxygen is required;
- (c) restrictions on smoking;
- (d) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and
- (e) location and method of opening emergency exits.

158. Spare electrical fuses

Where fuses are used, an operator shall not operate a helicopter unless it has spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

159. Lavatory fire extinguisher

Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31st December, 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31st December, 2018 shall—

- (a) meet the applicable minimum performance requirements of the State of Registry; and
- (b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer,

Annex A, Group II.

160. Operations manual, flight manual and charts

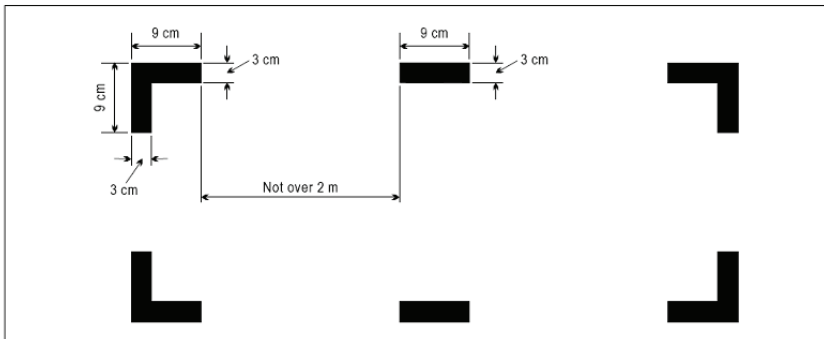
An operator shall not operate a helicopter unless it carries—

- (a) the operations manual prescribed in the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022;
- (b) the helicopter flight manual for the helicopter, or other documents containing performance data required for the application of the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 and any other information necessary for the operation of the helicopter within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and
- (c) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.

161. Marking of break-in points

(1) Where areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on a helicopter, the areas shall be marked as shown in figure 3 below.

Figure 3. Marking of break-in points



(2) The colour of the markings shall be red or yellow, and where necessary, they shall be outlined in white to contrast with the background.

(3) Where the corner markings are more than 2m apart, intermediate lines 9 cm × 3 cm shall be inserted so that there is no more than 2m between adjacent markings.

162. Flight recorders

(1) Crash-protected flight recorders shall comprise one or more of the following—

- (a) a flight data recorder or FDR;
- (b) a cockpit voice recorder or CVR;
- (c) an airborne image recorder or AIR; and
- (d) a data link recorder or DLR.

(2) Image and data link information may be recorded on either the CVR or the FDR in accordance with Schedule 10 to these Regulations.

(3) Combination recorders, FDR/CVR may be used to meet the flight recorder equipage requirements in these Regulations.

(4) Detailed requirements on flight recorders are contained in Schedule 10 to these Regulations.

(5) Lightweight flight recorders comprise one or more of the following—

- (a) an aircraft data recording system or ADRS;
- (b) a cockpit audio recording system or CARS;
- (c) an airborne image recording system or AIRS; or
- (d) a data link recording system or DLRS.

(6) Image and data link information may be recorded on either the CARS or the ADRS in accordance with Schedule 10 to these Regulations.

163. FDR and ADRS

Parameters to be recorded shall be those listed in Schedule 10 to these Regulations.

164. FDR and ADRS - applicability

(1) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175kg for which the individual certificate of airworthiness is first issued on or after 1st January 2016 unless it is equipped with an FDR which shall record at least the first 48 parameters listed in table A4-1 of Schedule 10 to these Regulations.

(2) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 7,000 kg, or having a passenger seating configuration of more than 19 passengers, for which the individual certificate of airworthiness is first issued on or after 1st January, 1989 unless it is equipped with an FDR which shall record at least the first 30 parameters listed in table A4-1 of Schedule 10 to these Regulations.

(3) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg, up to and including 7,000 kg, for which the individual certificate of airworthiness is first issued on or after 1st January, 1989, unless it is equipped with an FDR which shall record at least the first 15 parameters listed in table A4-1 of Schedule 10 to these Regulations.

(4) An operator shall not operate a turbine-engined helicopter of a maximum certificated take-off mass of over 2,250 kg, up to and including 3, 175 kg for which the application for type certification was submitted to a Contracting State on or after 1st January, 2018 unless it is equipped with—

- (a) an FDR which shall record at least the first 48 parameters listed in table A4-1 of Schedule 10 to these Regulations;
 - (b) a Class C AIR or AIRS which shall record at least flight path and speed parameters displayed to the pilot(s), as defined in table A4-3 of Schedule 10 to these Regulations;
- or

(c) an ADRS which shall record the first 7 parameters listed in table A4-3 of Schedule 10 of these Regulations.

(5) An operator shall not operate a helicopter of a maximum certificated take-off mass of 3,175 kg or less for which the individual certificate of airworthiness is first issued on or after 1st January, 2018 unless it is equipped with—

(a) an FDR which shall record at least the first 48 parameters listed in table A4-1 of Schedule 10 of these Regulations; or

(b) a class C AIR or AIRS which shall record at least flight path and speed parameters displayed to the pilots, as defined in table A4-3 of Schedule 10 of these Regulations; or

(c) an ADRS which shall record the first 7 parameters listed in table A4-3 of Schedule 10 of these Regulations.

(6) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg for which the application for type certificate is submitted to a Contracting State on or after 1 January 2023 unless it is equipped with an FDR capable of recording at least the first 53 parameters listed in table A4-1 of Schedule 10 of these Regulations.

(7) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg for which the individual certificate of airworthiness is first issued on or after 1st January, 2023 unless it is equipped with an FDR capable of recording at least the first 53 parameters listed in table A4-1 of Schedule 10 of these Regulations.

165. FDR and ADRS—recording technology

An operator of a helicopter shall not use engraving metal foil, frequency modulation, photographic film or magnetic tape on flight data recorders or aircraft data recording systems or airborne image recorders or airborne image recording systems.

166. FDR and ADRS - duration

An operator of a helicopter shall use FDRs that retain the information recorded during at least the last 10 hours of their operation.

167. CVR and audio recording systems- applicability

(1) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 7,000 kg unless it is equipped with a CVR.

(2) Subject to subregulation (1) for helicopters not equipped with FDR, at least main rotor speed shall be recorded on the CVR.

(3) An operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg for which the individual certificate of airworthiness is first issued on or after 1st January 1987 unless it is equipped with a CVR.

(4) Subject to subregulation (3) for helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

168. CVR and CARS- recording technology

An operator shall not operate a helicopter equipped with CVRS and CARS that use magnetic tape or wire.

169. CVR- duration

An operator shall not operate a helicopter required to be equipped with a CVR unless it is equipped with a CVR which shall retain the information recorded during at least the last 2 hours of its operation.

170. Data link recorders- applicability

(1) An operator shall not operate a helicopter for which the individual certificate of airworthiness is first issued on or after 1st January, 2016, which uses any of the data link communication applications referred to in paragraph 5.1(2) in Schedule 10 to these Regulations and is required to carry a CVR, unless it records the data link communication messages on a crash-protected flight recorder.

(2) All helicopters for which the individual certificate of airworthiness was first issued before 1st January, 2016, that are required to carry a CVR and are modified on or after 1st January, 2016 to use any of the data link communications applications referred to in paragraph 5.1(2) of Schedule 10 to these Regulations shall record

the data link communications messages on a crash-protected flight recorder unless the installed data link communications equipment is compliant with a type design or aircraft modification first approved prior to 1st January, 2016.

(3) A class B AIR may be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

(4) All helicopters for which the individual certificate of airworthiness was first issued before 1st January 2016, that are required to carry a CVR and are modified on or after 1st January 2016 to use any of the data link communications applications referred to in 5.1(2) of Schedule 10 to these Regulations shall record the data link communications messages on a crash-protected flight recorder.

171. Data link recorders- duration

The minimum recording duration shall be equal to the duration of the CVR.

172. Data link recorders- correlation

Data link recording shall allow correlation with the recorded cockpit audio.

173. Flight recorders — general construction and installation

(1) Flight recorders shall be constructed, located and installed to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.

(2) Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

174. Flight recorders — operation

(1) Flight recorders shall not be switched off during flight time.

(2) To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or

incident.

(3) The flight recorders shall not be reactivated before their disposition as determined in accordance with the Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

(4) The need for removal of the flight recorder records from the aircraft shall be determined by the investigation authority in the state conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

175. Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted annually to ensure the continued serviceability of the recorders.

176. Flight recorders electronic documentation

(1) The documentation requirement concerning FDR parameters provided by operators to accident investigation authorities shall be in electronic format and shall meet industry specifications.

(2) Subject to subregulation (1), industry specification for documentation concerning flight recorder parameters may be found in the ARINC 647A, Flight Recorder Electronic Documentation or equivalent document.

177. Instruments and equipment for flights operated under VFR and IFR

The flight instrument requirements referred to in regulations 178, 179 and 190 shall be met by combinations of instruments or by electronic displays.

178. VFR by day

An operator shall not operate a helicopter in accordance with VFR by day unless it is equipped with—

- (a) a magnetic compass;
- (b) an accurate timepiece indicating the time in hours, minutes and seconds;

- (c) a sensitive pressure altimeter;
- (d) an airspeed indicator; and
- (e) such additional instruments or equipment as may be prescribed by the authority.

179. VFR by night

(1) An operator shall not operate a helicopter in accordance with VFR at night unless it is equipped with—

- (a) magnetic compass;
 - (b) an accurate timepiece indicating the time in hours, minutes and seconds;
 - (c) a sensitive pressure altimeter;
 - (d) an airspeed indicator; and
 - (e) an attitude indicator or artificial horizon for each required pilot and one additional attitude indicator;
 - (f) a slip indicator;
 - (g) a heading indicator or directional gyroscope;
 - (h) a rate of climb and descent indicator;
 - (i) such additional instruments or equipment as may be prescribed by the authority and the following lights—
 - (i) the lights required under the Civil Aviation (Rules of the Air) Regulations, 2020 for aircraft in flight or operating on the movement area of a heliport;
 - (ii) two landing lights;
 - (iii) illumination for all instruments and equipment that are essential for the safe operation of the helicopter that are used by the flight crew;
 - (iv) lights in all passenger compartments; and
 - (v) a flashlight for each crew member station.
- (2) One of the landing lights shall be trainable, at least in the

vertical plane.

180. IFR

(1) An operator shall not operate a helicopter in accordance with IFR, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, unless it is equipped with—

- (a) a magnetic compass;
- (b) an accurate time piece indicating the time in hours, minutes and seconds;
- (c) two sensitive pressure altimeters;
- (d) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;
- (e) a slip indicator;
- (f) an attitude indicator or artificial horizon for each required pilot and one additional attitude indicator;
- (g) a heading indicator or directional gyroscope;
- (h) a means of indicating whether the power supply to the gyroscope instrument is adequate;
- (i) a means of indicating on the flight deck the outside air temperature;
- (j) a rate of climb and descent indicator;
- (k) a stabilization system, unless it has been demonstrated to the satisfaction of the certificating authority that the helicopter possesses, by nature of its design, adequate stability without such a system;
- (l) such additional instruments or equipment as may be prescribed by the authority; and
- (m) where operated at night, the lights specified in regulation 179 (1) (i) and (2) .

(2) An operator shall not operate a helicopter in accordance with IFR unless it is fitted with an emergency power supply, independent of the main electrical generating system, for the purpose

of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument or artificial horizon, clearly visible to the pilot-in-command.

(3) The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator is being operated by emergency power.

181. Ground Proximity Warning System

An operator shall not operate a helicopter in accordance with IFR and which has a maximum certificated take-off mass in excess of 3,175 kg or a maximum passenger seating configuration of more than 9 passengers unless it is equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

182. All helicopters on flights over water - means of flotation

(1) An operator shall not operate a helicopter over water unless it is fitted with a permanent or rapidly deployable means of flotation so as to ensure a safe ditching of the helicopter when-

- (a) engaged in offshore operations or other over water operations as prescribed by the authority; or
- (b) flying over water in a hostile environment at a distance from land corresponding to more than 10 minutes at normal cruise speed when operating in performance class 1 or 2; or
- (c) flying over water in a non-hostile environment at a distance from land specified by the authority of the responsible State when operating in performance class 1; or
- (d) flying over water beyond auto rotational or safe forced landing distance from land when operating in performance class 3.

(2) When operating in a hostile environment, a safe ditching requires a helicopter to be designed for landing on water or certificated in accordance with ditching provisions.

(3) When considering the distance beyond which flotation equipment is required, the State shall take into consideration the certification standard of the helicopter.

183. Emergency equipment

(1) An operator shall not operate a helicopter in performance Class 1 or 2 and in accordance with the provisions of regulation 182 unless it is equipped with—

- (a) one life jacket or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- (b) for offshore operations the life jacket shall be worn constantly unless the occupant is wearing an integrated survival suit that includes the functionality of the life jacket;
- (c) life-saving rafts in sufficient numbers to carry all persons on board, stowed to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken;
- (d) when two life rafts are fitted, each shall be capable to carry all occupants in the overload state; and
- (e) equipment for making the pyrotechnical distress signals described in the Civil Aviation (Rules of the Air) Regulations, 2020.

(2) An operator shall not operate a helicopter in performance Class 3 when operating beyond autorotational distance from land but within a distance from land specified by the appropriate authority of the responsible state unless it is equipped with one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

(3) When determining the distance from land referred to in subregulation (2), consideration shall be given to environmental

conditions and the availability of search and rescue facilities.

(4) For offshore operations, when operating beyond autorotational distance from land, the life jacket shall be worn unless the occupant is wearing an integrated survival suit that includes the functionality of the life jacket.

(5) An operator shall not operate a helicopter in performance Class 3 when operating beyond the distance specified in subregulation (2) unless it is equipped in compliance with these Regulations.

(6) In the case of a helicopter operating in performance Class 2 or 3, when taking off or landing at a heliport where, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in subregulation (1) a) shall be carried.

(7) Each life jacket and equivalent individual flotation device, when carried in accordance with these Regulations, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

(8) On any helicopter for which the individual certificate of airworthiness is first issued on or after 1st January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of this regulation shall be deployable by remote control.

(9) Rafts which are not deployable by remote control and which have a mass of more than 40 kg shall be equipped with some means of mechanically assisted deployment.

(10) On any helicopter for which the individual certificate of airworthiness was first issued before 1st January 1991, the provisions of subregulation (8) and (9) shall be complied with.

184. All helicopters on flights over designated sea areas

(1) An operator shall not operate a helicopter over sea areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, unless it is equipped

with life-saving equipment including means of sustaining life as may be appropriate to the area overflown.

(2) For offshore operations, a survival suit shall be worn by all occupants when the sea temperature is less than 10°C or when the estimated rescue time exceeds the calculated survival time.

(3) When the elevation and strength of the sun results in a high temperature hazard on the flight deck, consideration shall be given to alleviating the flight crew from this regulation.

(4) When establishing rescue time, the sea state and the ambient light conditions shall be taken into consideration.

185. All helicopters on flights over designated land areas

An operator shall not operate a helicopter, across land areas which have been designated by the state concerned as areas in which search and rescue would be especially difficult, unless it is equipped with such signalling devices and life-saving equipment including means of sustaining life as may be appropriate to the area overflown.

186. Emergency locator transmitter (ELT)

(1) All helicopters operating in performance Class 1 and 2 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in regulation 182 (a) and (b) with at least one automatic ELT and one ELT(S) in a raft or life jacket.

(2) ELT equipment carried to satisfy the requirements of subregulation (1) shall operate in accordance with the relevant provisions of the Civil Aviation (Aeronautical Telecommunication – Communication Systems) Regulations, 2022.

187. All helicopters on high altitude flights

(1) Approximate altitude in the standard atmosphere corresponding to the value of absolute pressure used in this regulation is as follows—

| Absolute Pressure | Metres | feet |
|-------------------|--------|-------|
| 700 hPa | 3000 | 10000 |
| 620 hPa | 4000 | 13000 |

| | | |
|---------|------|-------|
| 376 hPa | 7600 | 25000 |
|---------|------|-------|

(2) An operator shall not operate a helicopter at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments unless it is equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required by the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

(3) An operator shall not operate a helicopter at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments unless it is provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

(4) An operator shall not operate a helicopter at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa which cannot descend safely within 4 minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, unless it is provided with automatically deployable oxygen equipment to comply with the requirements of the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

(5) The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

188. All helicopters in icing conditions

An operator shall not operate a helicopter unless it is equipped with suitable anti-icing or de-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

189. Helicopters when carrying passengers —significant-weather detection

An operator shall not operate a helicopter carrying passengers unless it is equipped with operative weather radar or other significant-weather detection equipment whenever such helicopter is being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable, may be expected to exist along the route either at night or under instrument meteorological conditions.

190. Document attesting noise certification

(1) An operator of a helicopter required to comply with noise certification requirements in the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 shall carry on board a document attesting noise certification.

(2) When the document, or suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

191. Helicopters carrying passengers — cabin crew seats

(1) An operator shall not operate a helicopter unless it is equipped with a forward or rearward facing within 15 degrees of the longitudinal axis of the helicopter seat, fitted with a safety harness for the use of each cabin crew member required to comply with the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

(2) Subject to regulation 154, a seat and seat belt shall be provided for the use of each additional cabin crew member.

(3) Cabin crew seats shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.

192. Helicopters required to be equipped with a pressure-altitude reporting transponder

Except otherwise authorised by the authority, an operator shall not operate a helicopter unless it is equipped with a pressure-altitude reporting transponder which operates in accordance with the requirements of the Civil Aviation (Surveillance and Collision

Avoidance Systems) Regulations, 2022.

193. Microphones

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones.

194. Vibration health monitoring system

An operator shall not operate a helicopter with a maximum certificated take-off mass in excess of 3,175 kg or a maximum passenger seating configuration of more than 9 passengers unless it is equipped with a vibration health monitoring system.

195. Helicopters equipped with automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS

(1) An owner or operator shall not operate a helicopter equipped with automatic landing systems, Head-Up Display(HUD) or equivalent displays, Enhanced Vision Systems (EVS) , Synthetic Vision Systems (SVS) or Combines Vision Systems (CVS) or any combination of those systems into a hybrid system, unless the use of such systems for the safe operation of the helicopter is approved by the State of the Operator.

(2) The authority shall not approve the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, unless the operator—

- (a) ensures that the equipment meets the appropriate airworthiness certification requirements;
- (b) has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS; and
- (c) has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

196. Electronic Flight Bag - equipment

Where portable EFBs are used on board a helicopter, the operator shall ensure that they do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter.

197. EFB functions

(1) Where EFBs are used on board a helicopter the operator shall—

- (a) assess the safety risks associated with each EFB function;
- (b) establish and document the procedures for the use of and training requirements for the device and each EFB function; and
- (c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

(2) The State of the Operator shall issue a specific approval for the operational use of EFB functions to be used for the safe operation of helicopters.

198. EFB specific approval

Prior to the authority issuing a specific approval for the operational use of EFBs, the operator shall—

- (a) ensure that the EFB equipment and its associated installation hardware, including interaction with helicopter systems where applicable, meet the appropriate airworthiness certification requirements;
- (b) assess the safety risks associated with the operations supported by the EFB functions;
- (c) establish requirements for redundancy of the information where appropriate contained and displayed by the EFB functions;
- (d) establish and document procedures for the management of the EFB functions including any databases that may be used; and
- (e) establish and document the procedures for the use of, and

training requirements for the EFB functions.

Helicopter Communication, Navigation and Surveillance Equipment

199. Communication equipment

(1) An operator shall not operate a helicopter unless it is provided with radio communication equipment capable of—

- (a) conducting two-way communication for heliport control purposes;
- (b) receiving meteorological information at any time during flight; and
- (c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the Uganda Communication Commission.

(2) The requirements of subregulation (1) are considered fulfilled where the ability to conduct the communications specified in this regulation is established during radio propagation conditions, which are normal for the route.

(3) The radio communication equipment required in accordance with subregulation (1) shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

(4) For operations where communication equipment is required to meet the Required Communication Performance (RCP) specification for Performance Based Communication (PBC), a helicopter shall, in addition to the requirements specified in subregulation (1)—

- (a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specifications;
- (b) have information relevant to the helicopter RCP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and

- (c) have information relevant to the helicopter RCP specification capabilities included in the Minimum Equipment List (MEL).

(5) The authority shall, for operations where an RCP specification for PBC has been prescribed, ensure that the operator has established and documented—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(6) The authority shall ensure that, in respect of the helicopters referred to in subregulation (4), adequate provisions exist for—

- (a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022;
- (b) taking immediate corrective action for individual helicopters, helicopter types or operators, identified in such reports as not complying with the RCP specifications.

200. Navigation equipment

(1) An operator shall not operate a helicopter unless it is provided with navigation equipment which will enable it to proceed in accordance with—

- (a) its operational flight plan; and
- (b) the requirements of air traffic services; except when authorised by the appropriate authority, navigation for

flights under VFR is accomplished by visual reference to landmarks.

(2) An operator shall not operate a helicopter where a navigation specification for PBN has been prescribed, unless the helicopter in addition to the requirements specified in subregulation (1)—

- (a) is provided with navigation equipment which enables it to operate in accordance with the prescribed navigation specifications;
- (b) has information relevant to the helicopter navigation specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and
- (c) has information relevant to the helicopter navigation specification capabilities included in the MEL.

(3) The authority shall, for operations where a navigation specification for PBN has been prescribed, ensure that the operator has established and documented—

- (a) the normal and abnormal procedures, including contingency procedures;
- (b) the flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate navigation specifications.

(4) The authority shall issue a specific approval for operations based on PBN authorisation required or AR navigation specifications.

(5) An operator shall not operate a helicopter unless it is sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the

flight, the remaining equipment will enable the helicopter to navigate in accordance with these Regulations.

(6) On flights in which it is intended to land in instrument meteorological conditions, a helicopter shall be provided with appropriate navigation equipment providing guidance to a point from which a visual landing can be effected.

(7) The equipment referred to in subregulation (6) shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

201. Surveillance equipment

(1) An operator shall not operate a helicopter unless it is provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

(2) For operations where surveillance equipment is required to meet an Required Surveillance Performance (RSP) specification for performance-based surveillance, an operator shall not operate a helicopter unless, in addition to the requirements specified in subregulation (1)—

- (a) it is provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specifications;
- (b) has information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and
- (c) has information relevant to the helicopter RSP specification capabilities included in the MEL.

(3) Where an RSP specification for PBS has been prescribed, the Operator shall establish and document—

- (a) the normal and abnormal procedures, including contingency procedures;

- (b) the flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
 - (c) a training programme for relevant personnel consistent with the intended operations; and
 - (d) appropriate maintenance procedures to ensure continued airworthiness in accordance with appropriate RSP specifications
- (4) The operator shall not operate a helicopter, referred to in subregulation (2), unless adequate provisions exist for—
- (a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022, and
 - (b) taking immediate corrective action for individual helicopter, helicopter types or operators, identified in such reports as not complying with the RSP specifications.

202. Installation

The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communication, navigation or surveillance purposes.

203. Electronic navigation data management

(1) The operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground, unless the authority has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment.

(2) Subject to subregulation (1), the operator shall continue to monitor both the process and products.

(3) The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic

navigation data to all aircraft.

PART VII—HELICOPTER OPERATIONS - GENERAL AVIATION

Helicopter Instruments, Equipment and Flight Documents

204. Helicopters for general aviation operations-applicability

This Part provides for aircraft instruments, equipment and flight documents requirements for helicopters for general aviation operations.

205. General

(1) In addition to the minimum equipment required for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in these Regulations shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted.

(2) Subject to subregulation (1), the instruments and equipment, including their installation, shall be approved or accepted by the authority

206. Instruments

An owner or operator shall not operate a helicopter unless it is equipped with instruments, which shall enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvre, and observe the operating limitations of the helicopter in the expected operating conditions.

207. Equipment – first aid

An owner or operator shall not operate a helicopter unless it is equipped with or carries on board an accessible first-aid kit.

208. Portable fire extinguishers

An owner or operator shall not operate a helicopter unless it is equipped with or carries on board portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter and at least one shall be located in-

- (a) the pilot's compartment; and

- (b) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

209. Seat, berth and seat belt or safety harness

An owner or operator shall not operate a helicopter unless it is equipped with—

- (a) a seat or berth for each person 2 years of age and above; and
- (b) a seat belt for each seat and restraining belts for each berth.

210. Operations manual, flight manual, pilots's operating handbook, owner's manual and charts

An owner or operator shall not operate a helicopter unless it carries—

- (a) the flight manual, pilot's operating handbook, owner's manual or other documents or information concerning any operating limitations prescribed for the helicopter by the certificating authority of the State of Registry, required for the compliance with the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.;
- (b) any specific approval issued by the State of Registry, where applicable, for the operations to be conducted;
- (c) current and suitable charts for the route of the proposed flight and all routes along which the flight may be diverted;
- (d) procedures, as prescribed in the Civil Aviation (Rules of the Air) Regulations, 2020 for pilots-in-command of intercepted aircraft;
- (e) a list of visual signals for use by intercepting and intercepted aircraft, as contained in the applicable Civil aviation (Rules of the Air) Regulations 2020; and
- (f) the journey log book for the helicopter.

211. Spare electrical fuses

Where fuses are used, an owner or operator shall not operate a helicopter unless it has spare electrical fuses of appropriate ratings for

replacement of those accessible in flight.

212. Lavatory fire extinguisher

(1) Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31st December, 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31st December, 2018 shall-

- (a) meet the applicable minimum performance requirements of the State of Registry; and
- (b) not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, Annex A, Group II.

(2) An owner or operator shall not operate a helicopter on all flights unless it is equipped with the ground-air signal codes for search and rescue purposes.

(3) An owner or operator shall not operate a helicopter on all flights unless it is equipped with a safety harness for each flight crewmember seat.

213. Marking of break-in points

(1) Where areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on a helicopter, such areas shall be marked as shown in figure 4 below.

(2) The colour of the markings shall be red or yellow, and where necessary they shall be outlined in white to contrast with the background.

(3) If the corner markings are more than 2 m apart, intermediate lines 9 cm × 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

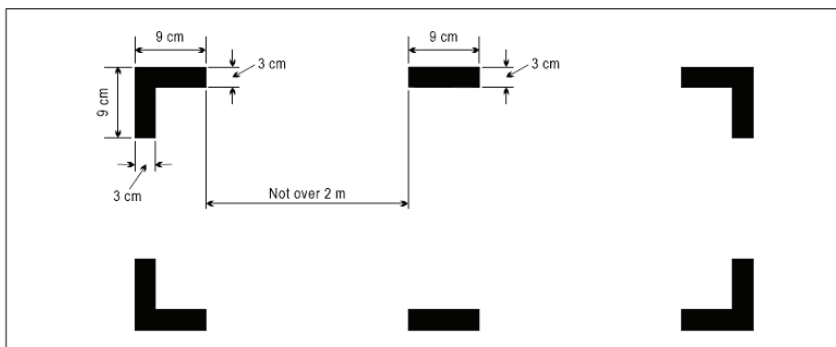


Figure 4. Marking of break-in points

214. Instruments and equipment for flights operated under VFR and IFR

The flight instrument requirements referred to in regulations 215, 216 and 217 in these Regulations shall be met by combinations of instruments or by electronic displays.

215. VFR by day

An owner or operator shall not operate a helicopter when operating in accordance with VFR by day unless it is equipped with—

- (a) a magnetic compass;
- (b) a sensitive pressure altimeter;
- (c) an attitude indicator or artificial horizon for each required pilot and one additional attitude indicator;
- (d) a heading indicator or directional gyroscope;
- (e) an air speed indicator;
- (f) a means of measuring and displaying the timing in hours, minutes and seconds; and
- (g) such additional instruments or equipment as may be prescribed by the authority.

216. VFR by night

(1) An owner or operator shall not operate a helicopter when operating in accordance with VFR at night unless it is equipped with—

- (a) magnetic compass;
- (b) a sensitive pressure altimeter;
- (c) an attitude indicator or artificial horizon for each required pilot and one additional attitude indicator;
- (d) a heading indicator or directional gyroscope;
- (e) an airspeed indicator;
- (f) a means of measuring and displaying the timing in hours, minutes and seconds;
- (g) a slip indicator;
- (h) a rate of climb and descent indicator;
- (i) such additional instruments or equipment as may be prescribed by the authority;
- (j) the following lights—
 - (i) the lights required by the applicable Civil Aviation (Rules of the Air) Regulations, 2020 for aircraft in flight or operating on the movement area of a heliport;
 - (ii) landing lights;
 - (iii) illumination for all instruments and equipment that are essential for the safe operation of the helicopter that are used by the flight crew;
 - (iv) lights in all passenger compartments; and
 - (v) a flashlight for each crew member station.

(2) The landing light specified in subregulation (1) shall be trainable, at least in the vertical plane.

217. IFR

An owner or operator shall not operate a helicopter in accordance

with IFR, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, unless it is equipped with—

- (a) a magnetic compass;
- (b) two sensitive pressure altimeters;
- (c) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;
- (d) a slip indicator;
- (e) an attitude indicator or artificial horizon for each required pilot and one additional attitude indicator;
- (f) a heading indicator or directional gyroscope;
- (g) a means of indicating whether the power supply to the gyroscope instrument is adequate;
- (h) a means of indicating on the flight deck the outside air temperature;
- (i) a rate of climb and descent indicator;
- (j) such additional instruments or equipment as may be prescribed by the authority;
- (k) where operated at night, the lights specified in regulation 216 (1) (j) and (2); and
- (l) means of measuring and displaying the time in hours, minutes and seconds.

218. All helicopters on flights over water - means of flotation

(1) An owner or operator shall not operate a helicopter flown over water unless it is fitted with a permanent or rapidly deployable means of flotation so as to ensure a safe ditching of the helicopter when—

- (a) engaged in offshore operations or other over water operations as prescribed by the State of Registry; or
- (b) flying at a distance from land specified by the appropriate state authority.

(2) When determining the distance from land referred to in subregulation (1), consideration shall be given to environmental conditions and the availability of search and rescue facilities.

219. Emergency equipment

(1) An owner or operator shall not operate a helicopter in accordance with the provisions of regulation 218 unless it is equipped with—

- (a) one life jacket or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- (b) when not precluded by consideration related to the type of helicopter used—
 - (i) life-saving rafts in sufficient numbers to carry all persons on board stowed to facilitate their ready use in emergency;
 - (ii) such life-saving equipment including means of sustaining life as appropriate to the flight to be undertaken; and
- (c) equipment for making the pyrotechnical distress signals described in the Civil Aviation (Rules of the Air) Regulations, 2020.

(2) When taking off or landing at a heliport where, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in subregulation (1) (a) shall be carried.

(3) Each life jacket and equivalent individual flotation device, when carried in accordance with regulation 218, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

(4) A helicopter for which the individual certificate of airworthiness is first issued on or after 1st January, 1991, at least 50

per cent of the life rafts carried in accordance with this regulation shall be deployable by remote control.

(5) Rafts which are not deployable by remote control and which have a mass of more than 40 kgs shall be equipped with some means of mechanically assisted deployment.

(6) A helicopter for which the individual certificate of airworthiness was first issued before 1st January, 1991, the provisions of subregulation (4) and (5) shall be complied with.

220. All helicopters on flights over designated land areas

An owner or operator shall not operate a helicopter, across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, unless it is equipped with such signaling devices and life-saving equipment, including means of sustaining life as may be appropriate to the area overflown.

221. All helicopters on high altitude flights

(1) An owner or operator shall not operate an unpressurized helicopter at high altitude unless it carries equipment for storing and dispensing the oxygen supplies required in the applicable Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022

(2) An owner or operator shall not operate a pressurized helicopter at high altitude unless it carries emergency oxygen storage and dispensing equipment capable of storing and dispensing the oxygen supplies required in the applicable Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022

222. Document attesting noise certification

(1) An owner or operator of a helicopter required to comply with noise certification requirements in the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 shall carry on board a document attesting noise certification.

(2) When the document, or suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

223. Flight Recorders

(1) Crash-protected flight recorders comprise one or more of the following—

- (a) a flight data recorder or FDR;
- (b) a cockpit voice recorder or CVR;
- (c) an airborne image recorder or AIR;
- (d) a data link recorder or DLR.

(2) Image and data link information may be recorded on either the CVR or the FDR in accordance with Schedule 10 to these Regulations.

(3) Combination recorders, Flight Data Recorder and Cockpit Voice Recorder may be used to meet the flight recorder equipage requirements in these Regulations and Schedule 10 to these Regulations.

(4) Detailed requirements on flight recorders are contained in Schedule 10 to these Regulations.

(5) Light weight flight recorders comprise one or more of the following—

- (a) an aircraft data recording system or ADRS;
- (b) a cockpit audio recording system or CARS;
- (c) an airborne image recording system or AIRS; and
- (d) a data link recording system or DLRS.

(6) Image and data link information may be recorded on either the CARS or the ADRS in accordance with the Schedule 10 to these Regulations.

224. FDR and ADRS

Parameters to be recorded shall be those listed in Schedule 10 to these Regulations

225. FDR and ADRS–applicability

(1) An owner or operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg for which the individual certificate of airworthiness is first issued on or after 1st January 2016 unless it is equipped with an FDR which shall record at least the first 48 parameters listed in table A4-1 of Schedule 10 to these Regulations.

(2) An owner or operator shall not operate a helicopter of a maximum certificated take-off mass of over 7,000 kg, or having a passenger seating configuration of more than 19 passengers, for which the individual certificate of airworthiness is first issued on or after 1st January, 1989 unless it is equipped with an FDR which shall record at least the first 48 parameters listed in table A4-1 of Schedule 10 to these Regulations.

(3) An owner of operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kg, up to and including 7,000 kg, for which the individual certificate of airworthiness is first issued on or after 1st January, 1989, unless it is equipped with a FDR which shall record atleast the first fifteen parameters listed in table A4-1 of Schedule 10 to these Regulations.

226. FDR and ADRS–recording technology

An operator or owner of a helicopter shall not use engraving metal foil, frequency modulation, photographic film or magnetic tape on flight data recorders or aircraft data recording systems or airborne image recorders or airborne image recording systems.

227. FDR and ADRS - duration

An owner or operator of a helicopter shall use FDRs that retain the information recorded during at least the last 10 hours of their operation.

228. Cockpit audio recording systems (CARS) – applicability

(1) An owner or operator shall not operate a helicopter of

a maximum certificated take-off mass of over 7,000 kgs unless it is equipped with a CVR.

(2) For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

(3) An owner or operator shall not operate a helicopter of a maximum certificated take-off mass of over 3,175 kgs for which the individual certificate of airworthiness is first issued on or after 1st January 1987 unless it is equipped with a CVR.

229. CVR- recording technology

An owner or operator of a helicopter shall not use magnetic tape or wire on CVR.

230. CVR- duration

An owner or operator shall not operate a helicopter required to be equipped with a CVR unless it is equipped with a CVR, which shall retain the information recorded during at least the last 2 hours of its operation.

231. Data link recorders- applicability

(1) An owner or operator shall not operate a helicopter for which the individual certificate of airworthiness is first issued on or after 1st January, 2016, which use any of the data link communications applications referred to in paragraph 5.1.2 of Schedule 10 to these Regulations and are required to carry a CVR, unless it records the data link communications messages on a crash-protected flight recorder.

(2) All helicopters for which the individual certificate of airworthiness was first issued before 1st January, 2016, that are required to carry a CVR and are modified on or after 1st January, 2016 to use any of the data link communications applications referred to in paragraph 5.1.2 of Schedule 10 to these Regulations shall record the data link communications messages on a crash-protected flight recorder unless the data link communications equipment is compliant with a type design or aircraft modification first approved prior to 1st January 2016.

(3) A Class B AIR may be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

(4) All helicopters for which the individual certificate of airworthiness was first issued before 1st January 2016, that are required to carry a CVR and are modified on or after 1st January, 2016 to use any of the data link communications applications referred to in paragraph 5.1.2 of Schedule 10 to these Regulations shall record the data link communications messages on a crash-protected flight recorder.

232. Data link recorders- duration

The minimum recording duration shall be equal to the duration of the CVR.

233. Data link recorders- correlation

Data link recording shall allow correlation with the recorded cockpit audio.

234. Flight recorders — general, construction and installation

(1) Flight recorders shall be constructed, located and installed to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.

(2) Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

235. Flight recorders — operation

(1) Flight recorders shall not be switched off during flight time.

(2) To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident.

(3) The flight recorders shall not be reactivated before their disposition as required by the Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

(4) The need for removal of the flight recorder records from the aircraft shall be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

236. Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

237. Flight recorders electronic documentation

(1) The documentation requirement concerning FDR parameters provided by an owner or operator to accident investigation authorities shall be in electronic format and shall take into account industry specifications.

(2) The industry specifications referred to in subregulation (1) may be found in ARINC 647A, flight recorder electronic documentation or equivalent.

238. Emergency Locator Transmitter

(1) The owner or operator shall not operate a helicopter in performance Class 1, 2 and 3 unless it is equipped with at least one automatic ELT and, when operating on flights over water as described in regulation 218 with at least one automatic ELT and one ELT in a raft or life jacket.

(2) ELT equipment carried to satisfy the requirements of subregulation (1) shall operate in accordance with the requirements of the Civil Aviation (Aeronautical Communication Systems) Regulations, 2022.

239. Helicopters required to be equipped with pressure-altitude reporting transponder

An owner or operator shall not operate a helicopter unless it is equipped with a pressure-altitude reporting transponder, which operates in accordance with the requirements of the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022.

240. Microphones

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones.

241. Helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS

(1) An owner or operator shall not operate a helicopter equipped with automatic landing systems, Head-Up Display(HUD) or equivalent displays, Enhanced Vision Systems (EVS) , Synthetic Vision Systems (SVS) or Combines Vision Systems (CVS), or any combination of those systems into a hybrid system, unless approved by the State of Registry based on the criteria for the use of such systems for the safe operation of the helicopter.

(2) Subject to subregulation (1), in establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall require that—

- (a) the equipment meets the appropriate airworthiness certification requirements;
- (b) the owner or operator has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS; and
- (c) the owner or operator has established and documented the procedures for the use of and training requirements for automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

242. Electronic Flight Bag -equipment

Where portable EFBs are used on board a helicopter, the pilot-in-command and the owner shall ensure that they do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter.

243. EFB functions

(1) Where EFBs are used on board a helicopter the pilot-in-command or the owner shall—

- (a) assess the safety risks associated with each EFB function;
- (b) establish the procedures for the use of and training requirements for the device and each EFB function; and
- (c) ensure that in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

(2) The authority shall issue a specific approval for the operational use of EFB functions for the safe operation of helicopters.

244. EFB specific approval

When issuing a specific approval for the operational use of EFBs, the authority shall ensure that—

- (a) the EFB equipment and its associated installation hardware, including interaction with helicopter systems where applicable, meet the appropriate airworthiness certification requirements;
- (b) the owner has assessed the safety risks associated with the operations supported by the EFB functions;
- (c) the owner has established requirements for redundancy of the information where appropriate, contained and displayed by the EFB functions;
- (d) the owner has established and documented procedures for the management of the EFB functions including any databases that may be used; and
- (e) the owner has established and documented the procedures for the use of, and training requirements for the EFB functions.

245. Helicopter operated under Article 83 bis agreement

(1) An owner or operator shall not operate a helicopter, under an Article 83 bis agreement entered into between the State of Registry and the State of the principal location of a general aviation operator, unless it carries a certified true copy of the agreement summary, in either an electronic or hard copy format.

(2) When the agreement summary specified in subregulation (1) is issued in a language other than English, an English translation shall be included.

(3) The agreement summary of an Article 83 bis agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred by the State of Registry to the State of the principal location of a general aviation operator under the agreement, when conducting surveillance activities such as ramp checks.

(4) The agreement summary shall be transmitted to ICAO together with the Article 83 bis Agreement for registration with the ICAO Council by the State of Registry or the State of the principal location of a general aviation operator.

(5) The agreement summary shall contain the information for the specific aircraft and follow the layout specified in the Part B of Schedule 9 to these Regulations.

(6) The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council shall contain the list of all aircraft affected by the agreement while the certified true copy required to be carried on board as required in subregulation (1) shall list only the specific aircraft carrying the copy.

Helicopter Communication, Navigation and Surveillance Equipment

246. Communication equipment

(1) An owner or operator shall not operate a helicopter with IFR or at night unless it is provided with radio communication equipment.

(2) The equipment in subregulation (1) shall be capable of conducting two-way communication with those aeronautical stations and on those frequencies prescribed by the Uganda Communications Commission.

(3) The requirements of subregulation (1) shall be considered fulfilled if the ability to conduct the communications specified in this

regulation is established during radio propagation conditions, which are normal for the route.

(4) When compliance with subregulation (1) requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

(5) An owner or operator shall not operate a helicopter in accordance with VFR controlled flight, unless it is provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the authority.

(6) An owner or operator shall not operate a helicopter on a flight to which the provisions of subregulations (2) or (5) apply, unless it is provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the authority.

(7) The radio communication equipment required in accordance with this regulation shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

(8) For operations where communication equipment is required to meet an RCP specification for performance-based communication, an owner or operator shall not operate a helicopter unless, in addition to the requirements specified in these Regulations-

- (a) it is provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specifications;
- (b) has information relevant to the helicopter RCP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and
- (c) has information relevant to the helicopter RCP specification capabilities included in the MEL.

(9) The State of Registry shall establish the criteria for operations where RCP specification for PBC has been prescribed.

(10) In establishing the criteria for operations where RCP specification for PBC has been prescribed by the authority, the operator or owner shall establish—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(11) The authority shall ensure that, in respect of the helicopters referred to in subregulation (8), adequate provisions exist for—

- (a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and
- (b) taking immediate corrective action for individual helicopters, helicopter types or operators, identified in such reports as not complying with the RCP specifications.

247. Navigation equipment

(1) An owner or operator shall not operate a helicopter unless it is provided with navigation equipment which shall enable it to proceed in accordance with—

- (a) its operational flight plan; and
- (b) the requirements of air traffic services;

except when authorised by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to

landmarks.

(2) For international general aviation, landmarks shall be located at least every 110 km or 60 NM.

(3) For operations where a navigation specification for performance-based navigation (PBN) has been prescribed, a helicopter shall, in addition to the requirements specified in subregulation (1)-

- (a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification;
- (b) have information relevant to the helicopter navigation specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and
- (c) have information relevant to the helicopter navigation specification capabilities included in the MEL.

(4) The authority shall establish criteria for operations where a navigation specification for PBN has been prescribed.

(5) In establishing the criteria for operations where a navigation specification for PBN has been prescribed by the authority, the operator or owner shall establish—

- (a) normal and abnormal procedures, including contingency procedures;
- (b) flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications;
- (c) a training programme for relevant personnel consistent with the intended operations; and
- (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate navigation specifications.

(6) The authority shall issue a specific approval for operations based on PBN authorisation required or AR navigation specifications.

(7) An owner or operator shall not operate a helicopter unless it is provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with subregulations (1) and (2).

(8) On flights intended to land in instrument meteorological conditions, a helicopter shall be provided with appropriate navigation equipment providing guidance to a point from which a visual landing can be effected.

(9) The equipment in subregulation (8) shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

248. Surveillance equipment

(1) An owner or operator shall not operate a helicopter unless it is provided with surveillance equipment, which shall enable it to operate in accordance with the requirements of air traffic services.

(2) For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance, an owner or operator shall not operate a helicopter unless, in addition to the requirements specified in subregulation (1)—

- (a) it is provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification;
- (b) has information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and
- (c) has information relevant to the helicopter RSP specification capabilities included in the MEL.

(3) The authority shall establish criteria for operations where an RSP specification for PBS has been prescribed.

(4) Subject to subregulation (3), when establishing criteria for

operations where an RSP specification for PBS has been prescribed by the authority, the operator or owner shall establish—

- (a) normal and abnormal procedures, including contingency procedures;
 - (b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
 - (c) a training programme for relevant personnel consistent with the intended operations; and
 - (d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.
- (5) The owner or operator shall not operate a helicopter referred to subregulation (2) unless adequate provisions exist for—
- (a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022; and
 - (b) taking immediate corrective action for individual helicopter, helicopter types or operators, identified in such reports as not complying with the RSP specifications.

PART VIII— GENERAL

249. Application for exemptions

(1) A person or operator may apply to the authority for an exemption from any provision of these Regulations.

(2) A request for exemption shall be made in accordance with the requirements of these Regulations and an application for the exemption shall be submitted and processed in a manner prescribed by the authority in the applicable technical guidance material.

(3) A request for an exemption shall contain the applicant's—

- (a) name;
- (b) physical address and mailing address;
- (c) telephone number;
- (d) fax number where available; and
- (e) email address.

(4) The application shall be accompanied by a fee prescribed by the authority in the applicable aeronautical information circulars for technical evaluation.

250. Exemptions

(1) The authority may, upon consideration of the circumstances of the application for exemption, issue an exemption providing relief from specified provisions of these Regulations, provided that—

- (a) the authority finds that the circumstances presented warrant the exemption; and
- (b) a level of safety shall be maintained equal to that provided by the Regulations from which the exemption is sought.

(2) The exemption referred to in subregulation (1) may be terminated or amended at any time by the authority.

(3) A person or operator who receives an exemption shall have a means of notifying the management and appropriate personnel performing functions subject to the exemption.

251. Suspension and revocation of approval

(1) The authority may, in the public interest, suspend provisionally pending further investigation or re-examine the original certification basis of any approval, exemption or such other document issued or granted under these Regulations.

(2) The authority may, upon the completion of an investigation and in the public interest, revoke, suspend, or vary any approval, exemption or such other document issued or granted under these Regulations.

(3) The authority may, in the public interest, prevent any person or aircraft from flying.

(4) A holder or any person having the possession or custody of any approval, exemption or other document which has been revoked, suspended or varied under these Regulations shall surrender it to the authority within a reasonable time after being required to do so by the authority.

(5) The breach of any condition subject to which any approval, exemption or any other document, other than a licence issued in respect of an aerodrome, has been granted or issued under these Regulations shall render the document invalid during the continuance of the breach.

252. Use and retention of records

(1) A person shall not—

(a) use any approval, exemption or such other document issued or required by or under these Regulations which has been forged, altered, revoked, or suspended or to which he or she is not entitled;

(b) forge or alter an approval, exemption or other document issued or required by or under these Regulations;

(c) lend any approval, exemption or such other document issued or required by or under these Regulations to any other person; or

(d) make any false representation for the purpose of procuring for himself or herself or any other person the grant issue renewal or variation of any such approval or exemption.

(2) During the period for which it is required under these Regulations to be preserved, no person shall mutilate, alter, render illegible or destroy any records required by or under these Regulations to be maintained, or knowingly make or procure or assist in the making of, any false entry in any record or wilfully omit to make a material entry in record.

(3) All entries in records required to be maintained by or under

these Regulations shall be made in a permanent and indelible material.

(4) A person shall not purport to issue any approvals, authorisations or exemptions under these Regulations unless he or she is authorised by the authority to do so.

(5) A person shall not issue any approval, authorisation or exemption of the kind referred to in subregulation (4) unless he or she has satisfied himself or herself that all statements in the certificate are correct and that the applicant is qualified to hold that certificate.

253. Reports of violation

(1) Any person who knows of a violation of the Act or these Regulations, rule or order issued by the authority shall report it to the authority.

(2) The authority shall determine the nature and type of any additional investigation or enforcement action that may be taken.

254. Enforcement of directions

(1) The authority shall take enforcement action on any regulated entity that fails to comply with the provisions of these Regulations.

(2) The Inspectors of the authority holding valid delegations shall take necessary action to preserve safety where undesirable conditions have been detected.

(3) The action referred to in subregulation (2) may include—

(a) in the case of a regulated entity, imposition of operating restrictions until such a time when the existing and undesirable conditions has been resolved;

(b) in the case of a licenced personnel, require that an individual does not exercise the priviledges of the licence until such a time that the undesirable condition has been resolved.

(4) In carrying out the enforcement actions under subregulation (2), the inspectors of the authority shall invoke the powers with due

care and act in good faith in the interest of preserving safety.

255. Aeronautical user fees

(1) The authority may notify the fees to be charged in connection with the issue, validation, renewal, extension or variation of any certificate, licence, exemption or other document, including the issue of a copy thereof, or the undergoing of any examination, test, inspection or investigation or the grant of any permission or approval, required by, or for the purpose of these Regulations any orders, notices or proclamations made under these Regulations.

(2) Upon application being made in connection with which a fee is chargeable in accordance with subregulation (1), the applicant shall be required to pay the fees, before the application is received.

(3) Where after the payment has been made, the application is withdrawn by the applicant, ceases to have effect or is refused, the authority shall not refund the payment.

256. Application of these Regulations to Government and visiting forces, etc

(1) These Regulations shall apply to aircraft, not being military aircraft, belonging to or exclusively employed in the service of the Government, and for the purposes of such application, the Department or other authority for the time being responsible for management of the aircraft shall be deemed to be the operator of the aircraft, and in the case of an aircraft belonging to the Government, to be the owner of the interest of the Government in the aircraft.

(2) Except as otherwise expressly provided, the naval, military and air force authorities and member of any visiting force and property held or used for the purpose of such a force shall be exempt from the provision of these Regulations to the same extent as if the visiting force formed part of the military force of Uganda.

257. Extra-territorial application of these Regulations

Except where the context otherwise requires, the provisions of these Regulations shall—

(a) in so far as they apply, whether by express reference or

otherwise, to aircraft registered in Uganda, apply to such aircraft wherever they may be;

- (b) in so far as they apply, whether by express reference or otherwise, to other aircraft, apply to such aircraft when they are within Uganda;
- (c) in so far as they prohibit, require or regulate, whether by express reference or otherwise, the doing of anything by any person in, or by any of the crew of, any aircraft registered in Uganda, shall apply to such persons and crew, wherever they may be; and
- (d) in so far as they prohibit, require or regulate, whether by express reference or otherwise, the doing of anything in relation to any aircraft registered in Uganda by other persons shall, where such persons are citizens of Uganda, apply to them wherever they may be.

PART IX— OFFENCES AND PENALTIES

258. Offences and penalties

(1) A person who contravenes any provision of these Regulations may have his or her licence, certificate, approval, authorisation, exemption or other document revoked or suspended by the authority.

(2) If any provision of these Regulations, orders, notices or proclamations made under these Regulations is contravened in relation to an aircraft, the operator of that aircraft and the pilot in command, if the operator or the pilot in command is not the person who contravened that provision shall, without prejudice to the liability of any other person for that contravention, be deemed for the purposes of the following provisions of this regulation to have contravened that provision unless he or she proves that the contravention occurred without his or her consent or connivance and that he or she exercised all due diligence to prevent the contravention.

(3) A person who contravenes any provision specified as an “A” provision in Schedule 11 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points

for each offence or each flight or to imprisonment not exceeding one year or both.

(4) A person who contravenes any provision specified as a “B” provision in Schedule 11 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points for each offence or each flight or to imprisonment for a term not exceeding three years or to both.

(5) A person who contravenes any provision of these Regulations not being a provision referred to in Schedule 11 to these Regulations, commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points and in the case of a second or subsequent conviction for the same offence to a fine not exceeding two hundred currency points.

PART X— REVOCATION AND SAVINGS

259. Revocation of S.I. No. 35 of 2020, savings and transitional

(1) The Civil Aviation (Instruments and Equipment) Regulations, 2020, S.I. No.35 of 2020 are revoked.

(2) A licence, certificate, authorisation, exemption or other approval granted by the authority under the Regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, exemption or other approval under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Notwithstanding regulation 258, a person granted

a licence, certificate, authorisation, exemption or other approval, continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the licence, certificate, authorisation, exemption cancelled by the authority.

SCHEDULE 1

Regulation 23(6)

**ARTICLE 83 bis AGREEMENT SUMMARY
Commercial Air Transport- Aeroplanes**

Note.— A certified true copy of the agreement summary to be carried on board.

1. Purpose and scope

The Article 83 bis agreement summary shall contain the information in the template in paragraph 2, in a standardized format.

1. Article 83 bis agreement summary

| ARTICLE 83 bis AGREEMENT SUMMARY | | |
|---|---|---|
| Title of the Agreement: | | |
| State of Registry: | | Focal point: |
| State of the Operator: | | Focal point: |
| Date of signature: | By State of Registry ¹ : | |
| | By State of the Operator ¹ : | |
| Duration: | Start Date ¹ : | End Date (if applicable) ² : |

| | |
|----------------------------------|--|
| | |
| Languages of the Agreement | |
| | |
| ICAO Registration No.: | |
| | |
| Umbrella Agreement (if any) with | |
| ICAO Registration number: | |

| | | | |
|---|---|-----|--|
| Chicago Convention | ICAO Annexes affected by the transfer to the State of the Operator of responsibility in respect of certain functions and duties | | |
| Article 12: Rules of the Air | Annex 2, all chapters | Yes | |
| | | No | |
| Article 30 a): Aircraft radio equipment | Annex 2, Radio Station Licence | Yes | |
| | | No | |
| | Annex 1, Chapters 1, 2, 3 and 6 | Yes | Annex 6: [Specify Part and paragraph] ³ |
| Articles 30 b) | and Annex 6 Part I, Radio Operator or | No | |
| and 32 a): Personnel Licensing | Annex 6, Part II (qualifications and /or Flight crew member Licencing); or Annex 6, Part III, section II, (Composition of the flight crew) (radio operator) and/or Annex 6 Part III section III, (qualifications) | | |

| | | | |
|---|-------------------------------------|-----|--|
| | | | |
| | Annex 6 | Yes | [Specify Part and chapters] ³ |
| Article 31: Certificates of Airworthiness | Part I or Part III, Section II | No | |
| | Annex 6 | Yes | [Specify Part and chapters] ³ |
| | Part II or Part III, Section III | No | |
| | Annex 8 | Yes | [Specify chapters] ³ |
| | Part II, Chapters 3 and 4 | No | |

Aircraft affected by the transfer of responsibilities to the State of the Operator

| Aircraft make, model, series | Nationality and Registration marks | Serial No | AOC No. (Commercial air transport) | Dates of transfer of responsibilities | |
|------------------------------|------------------------------------|-----------|------------------------------------|---------------------------------------|---------------------------------|
| | | | | From ¹ | To (if applicable) ² |
| | | | JHB | | |
| | | | | | |
| | | | | | |

Notes.—

1. *dd/mm/yyyy.*
2. *dd/mm/yyyy or N/A if not applicable.*
3. *Square brackets indicate information that needs to be provided.*

SCHEDULE 2

Regulations 33(2), 34,41,44 and 45

FLIGHT RECORDERS (COMMERCIAL AIR TRANSPORT — AEROPLANES)

The material in this Schedule concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following-

- (a) a flight data recorder (FDR);
- (b) a cockpit voice recorder (CVR);
- (c) an airborne image recorder (AIR);
- (d) a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following-

- (a) an aircraft data recording system (ADRS);
- (b) a cockpit audio recording system (CARS);
- (c) an airborne image recording system (AIRS);
- (d) a data link recording system (DLRS).

When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS

1. GENERAL REQUIREMENTS

- (1) Non-deployable flight recorder containers shall be painted a distinctive

orange colour.

- (2) Non-deployable crash-protected flight recorder containers shall—
 - (a) carry reflective material to facilitate their location; and
 - (b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practicable date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.
- (3) Automatic deployable flight recorder containers shall—
 - (a) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;
 - (b) carry reflective material to facilitate their location; and
 - (c) have an integrated automatically activated ELT.
- (4) The flight recorder systems shall be installed so that—
 - (a) the probability of damage to the recordings is minimized;
 - (b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and
 - (c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and
 - (d) for aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note.— The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.

- (5) The crash-protected flight recorders shall be installed so that they

receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

- (6) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.
- (7) The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.
- (8) Means shall be provided for an accurate time correlation between the flight recorder systems recordings.
- (9) The manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recorder systems—
 - (a) manufacturer's operating instructions, equipment limitations and installation procedures;
 - (b) parameter origin or source and equations which relate counts to units of measurement; and
 - (c) manufacturer's test reports.

2. FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEMS (ADRS)

2.1 Start and stop logic

The FDR or ADRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power.

2.2 Parameters to be recorded

- (1) The parameters that satisfy the requirements for FDRs are listed in Table A8-1. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters, which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded where an information data source for the

parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

- (2) Where further FDR recording capacity is available, recording of the following additional information shall be considered—
 - (a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority—
 - (i) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;
 - (ii) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, ETC.;
 - (iii) warnings and alerts; and
 - (iv) the identity of displayed pages for emergency procedures and checklists; and
 - (b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.
- (3) The parameters that satisfy the requirements for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) shall be recorded if an information source for the parameter is displayed to the pilot and is practicable to record—
 - (a) pressure altitude;
 - (b) indicated airspeed or calibrated airspeed;
 - (c) heading (primary flight crew reference);
 - (d) pitch attitude;
 - (e) roll attitude;

- (f) engine thrust/power;
 - (g) landing-gear status* ;
 - (h) total or outside air temperature*;
 - (i) time*;
 - (j) navigation data*: drift angle, wind speed, wind direction, latitude/longitude;
 - (k) radio altitude* .
- (4) The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table A8-3.
- (5) Where further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A8-3 shall be considered.

2.3 Additional information

- (1) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.
- (2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3. COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)

3.1 Start and stop logic

The CVR or CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 Signals to be recorded

- (1) The CVR shall record simultaneously on four separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the aeroplane by radio;
 - (b) aural environment on the flight deck;
 - (c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, when installed;
 - (d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and
 - (e) voice communication of flight crew members using the passenger address system, when installed.
- (2) The preferred CVR audio allocation shall be as follows—
 - (a) pilot-in-command audio panel;
 - (b) co-pilot audio panel;
 - (c) additional flight crew positions and time reference; and
 - (d) cockpit area microphone.
- (3) The CARS shall record simultaneously on two separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the aeroplane by radio;
 - (b) aural environment on the flight deck; and
 - (c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed.
- (4) The preferred CARS audio allocation shall be as follows—
 - (a) voice communication; and
 - (b) aural environment on the flight deck.

4. AUTOMATIC DEPLOYABLE FLIGHT RECORDER (ADFR)

4.1 Operation

The following requirements shall apply to an ADFR—

- (a) deployment shall take place when the aeroplane structure has been significantly deformed;
- (b) deployment shall take place when an aeroplane sinks in water;
- (c) ADFR shall not be capable of manual deployment;
- (d) the ADFR shall be able to float on water;
- (e) the ADFR deployment shall not compromise the safe continuation of the flight;
- (f) the ADFR deployment shall not significantly reduce the chance of survival of the recorder and of successful transmission by its ELT;
- (g) the ADFR deployment shall not release more than one piece;
- (h) an alert shall be made to the flight crew when the ADFR is no longer captive to the aircraft;
- (i) the flight crew shall have no means to disable ADFR deployment when the aircraft is airborne;
- (j) the ADFR shall contain an integrated ELT, which shall activate automatically during the deployment sequence. Such ELT may be of a type that is activated in-flight and provides information from which a position can be determined; and
- (k) the integrated ELT of an ADFR shall satisfy the same requirements as an ELT required to be installed on an aeroplane. The integrated ELT shall at least have the same performance as the fixed ELT to maximize detection of the transmitted signal.

Note 1.— Refer to the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (Doc 10054) for more information on ADFR.

Note 2.— where an integrated ELT of a type that is activated in flight is used within an ADFR, it could be a means to comply with the requirements of Regulation 65-location of Aeroplane in distress

5. DATA LINK RECORDER (DLR)

5.1 APPLICATIONS TO BE RECORDED

- (1) Where the aircraft flight path is authorized or controlled through the

use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note. — *Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.*

- (2) Messages applying to the applications listed in Table A8-2 shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

6. FLIGHT CREW-MACHINE INTERFACE RECORDINGS

6.1 START AND STOP LOGIC

The AIR or AIRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

6.2 CLASSES

- (1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1. — *To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

Note 2. — *There are no provisions for Class A AIR or AIRS in this document.*

6.2.2 A Class B AIR or AIRS captures data link message displays.

6.2.3 A Class C AIR or AIRS captures instruments and control panels.

Note. — *A Class C AIR or AIRS may be considered as a means for recording*

flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.

6.3 Applications to be recorded

- (2) The operation of switches and selectors and the information displayed to the flight crew from electronic displays shall be captured by sensors or other electronic means.
- (3) The recording of operation of switches and selectors by the flight crew shall include the following—
 - (a) any switch or selector that will affect the operation and the navigation of the aircraft; and
 - (b) selection of normal and alternate systems.
- (4) The recording of the information displayed to the flight crew from electronic displays shall include the following:
 - (a) primary flight and navigation displays;
 - (b) aircraft system monitoring displays;
 - (c) engine indication displays;
 - (d) traffic, terrain, and weather displays;
 - (e) crew alerting systems displays;
 - (f) stand-by instruments; and
 - (g) installed EFB to the extent it is practical.
- (5) Where image sensors are used, the recording of such images shall not capture the head and shoulders of the flight crew members while seated in their normal operating position.

7. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

- (1) Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.
- (2) FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the Authority, this period may be extended to two years provided these systems have demonstrated a high integrity of

serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

(3) Recording inspections shall be carried out as follows—

- (a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
- (b) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;
- (c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
- (d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;
- (e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and
- (f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.
- (g) an examination of the recorded messages on the DLR or DLRS

shall be carried out by replay of the DLR or DLRS recording.

- (4) A flight recorder system shall be considered unserviceable if there is a significant period of poor-quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.
- (5) A report of the recording inspection shall be made available on request to the authority for monitoring purposes.
- (6) Calibration of the FDR system—
 - (a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and
 - (b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

Table A8-1. Parameter characteristics for flight data recorders

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---|--|---|--|---------------------------|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure-altitude | | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed or calibrated airspeed | | 95 km/h (50 kt) to max V_{So} (<i>Note 1</i>) V_{So} to 1.2 V_D (<i>Note 2</i>) | 1 | ±5% ±3% | 1 kt (0.5 kt recommended) |
| 4 | Heading (primary flight crew reference) | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration (<i>Note 8</i>) | Application for type certification is submitted to a Contracting State before 1 January 2016 | -3 g to +6 g | 0.125 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |
| | | Application for type certification is submitted to a Contracting State on or after 1 January 2016 | -3 g to +6 g | 0.0625 | ±1% of maximum range excluding | 0.004 g |

| | | | | | | |
|-----|---|--|---|----------------|--|---|
| 6 | Pitch attitude | | ±75° or usable range whichever is greater | 0.25 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.25 | ±2° | 0.5° |
| 8 | Radio transmission Keying | | On-off (one discrete) | 1 | | |
| 9 | Power on each Engine <i>(Note 3)</i> | | Full range | 1 (per engine) | ±2% | 0.2% of full range or the resolution required to operate the aircraft |
| 10* | Trailing edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 11* | Leading edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 12* | Thrust reverser Position | | Stowed, in transit, and reverse | 1 (per engine) | | |
| 13* | Ground spoiler/speed Brake selection (selection and position) | | Full range or each discrete position | 1 | ±2% unless higher accuracy uniquely required | 0.2% of full range |
| 14 | Outside air Temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 15* | Autopilot/auto throttle/AFCS mode and engagement status | | A suitable combination of discretess | 1 | | |
| 16 | Longitudinal Acceleration <i>(Note 8)</i> | Application for type certification submitted to a Contracting State before 1 January 2016 | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | ±1 g | 0.0625 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 17 | Lateral acceleration <i>(Note 8)</i> | Application for type certification submitted to a Contracting State before 1 January 2016 | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | ±1 g | 0.0625 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) <i>(Notes 4 and 8)</i> | Application for type certification submitted to a Contracting State before 1 January 2016 | Full range | 0.25 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | Full range | 0.125 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |

| | | | | | |
|-----|---|---------------------------------------|-----|--|--|
| 19 | Pitch trim position | Full range | 1 | ±3% unless higher accuracy uniquely required | 0.3% of full range or as installed |
| 20* | Radio altitude | -6 m to 750 m (-20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 21* | Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation) | Signal range | 1 | ±3% | 0.3% of full range |
| 22* | Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation) | Signal range | 1 | ±3% | 0.3% of full range |
| 23 | Marker beacon passage | Discrete | 1 | | |
| 24 | Master warning | Discrete | 1 | | |
| 25 | Each NAV receiver frequency selection (<i>Note 5</i>) | Full range | 4 | As installed | |
| 26* | DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/IAN)) (<i>Notes 5 and 6</i>) | 0 – 370 km (0 – 200 NM) | 4 | As installed | 1 852 m (1 NM) |
| 27 | Air/ground status | Discrete | 1 | | |
| 28* | GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) | Discrete | 1 | | |
| 29* | Angle of attack | Full range | 0.5 | As installed | 0.3 % of full range |
| 30* | Hydraulics, each system (low pressure) | Discrete | 2 | | 0.5% of full range |
| 31* | Navigation data (latitude/longitude, ground speed and drift angle) (<i>Note 7</i>) | As installed | 1 | As installed | |

| | | | | | | |
|-----|--|--|--|-------------------------|---|--|
| 32* | Landing gear and gear selector position | | Discrete | 4 | As installed | |
| 33* | Groundspeed | | As installed | 1 | Data should be obtained from the most accurate system | 1 kt |
| 34 | Brakes (left and right brake pressure, left and right brake pedal position) | | (Maximum metered brake range, discretes or full range) | 1 | ±5% | 2% of full range |
| 35* | Additional engine parameters (EPR, N ₁ , indicated vibration level, N ₂ , EGT, fuel flow, fuel cut-off lever position, N ₃ , engine fuel metering valve position) | Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | Each engine each second | As installed | 2% of full range |
| 36* | TCAS/ACAS (traffic alert and collision avoidance system) | | Discretes | 1 | As installed | |
| 37* | Wind shear warning | | Discrete | 1 | As installed | |
| 38* | Selected barometric setting (pilot, co-pilot) | | As installed | 64 | As installed | 0.1 mb (0.01 in-Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 44* | Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN)) | | | 1 | As installed | |
| 45* | Selected decision Height | | As installed | 64 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot, co-pilot) | | Discrete(s) | 4 | As installed | |
| 47* | Multi-function/engine/alerts display format | | Discrete(s) | 4 | As installed | |
| 48* | AC electrical bus Status | | Discrete(s) | 4 | As installed | |

| | | | | | |
|-----|--|--------------|----|--|--------------------|
| 49* | DC electrical bus status | Discrete(s) | 4 | As installed | |
| 50* | Engine bleed valve position | Discrete(s) | 4 | As installed | |
| 51* | APU bleed valve position | Discrete(s) | 4 | As installed | |
| 52* | Computer failure | Discrete(s) | 4 | As installed | |
| 53* | Engine thrust command | As installed | 2 | As installed | |
| 54* | Engine thrust target | As installed | 4 | As installed | 2% of full range |
| 55* | Computed centre of gravity | As installed | 64 | As installed | 1% of full range |
| 56* | Fuel quantity in CG trim tank | As installed | 64 | As installed | 1% of full range |
| 57* | Head up display in use | As installed | 4 | As installed | |
| 58* | Para visual display on/off | As installed | 1 | As installed | |
| 59* | Operational stall protection, stick shaker and pusher activation | As installed | 1 | As installed | |
| 60* | Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glideslope) | As installed | 4 | As installed | |
| 61* | Ice detection | As installed | 4 | As installed | |
| 62* | Engine warning each engine vibration | As installed | 1 | As installed | |
| 63* | Engine warning each engine over temperature | As installed | 1 | As installed | |
| 64* | Engine warning each engine oil pressure low | As installed | 1 | As installed | |
| 65* | Engine warning each engine over speed | As installed | 1 | As installed | |
| 66* | Yaw trim surface position | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |

| | | | | | |
|-----|----------------------------|------------|---|--|--------------------|
| 67* | Roll trim surface position | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 68* | Yaw or sideslip angle | Full range | 1 | ±5% | 0.5° |

| | | | | | | |
|-----|---|--|--|------|--------------------------------------|------------------------------------|
| 69* | De-icing and/or anti-icing systems selection | | Discrete(s) | 4 | | |
| 70* | Hydraulic pressure (each system) | | Full range | 2 | ±5% | 100 psi |
| 71* | Loss of cabin pressure | | Discrete | 1 | | |
| 72* | Cockpit trim control input position, Pitch | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 73* | Cockpit trim control input position, Roll | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 74* | Cockpit trim control input position, Yaw | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 75* | All cockpit flight control input forces (control wheel, control column, rudder pedal) | | Full range (±311 N (±70 lbf), ± 378 N (±85 lbf), ± 734 N (±165 lbf)) | 1 | ±5% | 0.2% of full range or as installed |
| 76* | Event marker | | Discrete | 1 | | |
| 77* | Date | | 365 days | 64 | | |
| 78* | ANP or EPE or EPU | | As installed | 4 | As installed | |
| 79* | Cabin pressure altitude | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed (0 ft to 40 000 ft recommended) | 1 | As installed | 100 ft |
| 80* | Aeroplane computed weight | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 81* | Flight director command | Application for type certification submitted to a Contracting State on or after 1 January 2023 | Full range | 1 | ± 2° | 0.5° |
| 82* | Vertical speed | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 0.25 | As installed (32 ft/min recommended) | 16 ft/min |

Notes. —

1. V_{So} stalling speed or minimum steady flight speed in the landing configuration is in Section “Abbreviations and Symbols”.
2. V_D design diving speed.
3. Record sufficient inputs to determine power.
4. For aeroplanes with control systems in which movement of a control surface will back drive the pilot’s control, “or” applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot’s control,

“and” applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.

5. *Where signal available in digital form.*
6. *Recording of latitude and longitude from INS or other navigation system is a preferred alternative.*
7. *When signals readily available.*
8. *It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording interval, accuracy limits or recording resolution description detailed in this Schedule.*

Table A8-1. Parameter characteristics for flight data recorders

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy | |
|---------------|--|---|--|---|---|---------------------------|
| | | | | | limits (sensor input compared to FDR readout) | Recording resolution |
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure-altitude | | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) (95 km/h (50 kt) to max | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed or calibrated airspeed | | V_{so} (Note 1) V_{so} to 1.2 V_D (Note 2) | 1 | ±5% ±3% | 1 kt (0.5 kt recommended) |
| 4 | Heading (primary flight crew reference) | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration (Note 8) | Application for type certification is submitted to a Contracting State before 1 January 2016 | -3 g to +6 g | 0.125 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |
| | | Application for type certification is submitted to a Contracting State on or after 1 January 2016 | -3 g to +6 g | 0.0625 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |

| 6 | Pitch attitude | | ±75° or usable range whichever is greater | 0.25 | ±2° | 0.5° |
|---------------|---|---------------|---|---|--|---|
| 7 | Roll attitude | | ±180° | 0.25 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | | |
| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
| 9 | Power on each engine <i>(Note 3)</i> | | Full range | 1 (per engine) | ±2% | 0.2% of full range or the resolution required to operate the aircraft |
| 10* | Trailing edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 11* | Leading edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 12* | Thrust reverser position | | Stowed, in transit, and reverse | 1 (per engine) | | |
| 13* | Ground spoiler/speed brake selection (selection and position) | | Full range or each discrete position | 1 | ±2% unless higher accuracy uniquely required | 0.2% of full range |
| 14 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 15* | Autopilot/auto throttle/AFCS mode and | | A suitable combination of discrettes | 1 | | |

| | | | | | | |
|----|---------------------------------------|--|------|--------|------------------------------------|---------|
| | engagement status | | | | | |
| 16 | Longitudinal acceleration (Note 8) | Application for type certification submitted to a Contracting State before 1 January 2016 | ±1 g | 0.25 | ±0.015 g | 0.004 g |
| | | | | | excluding a datum error of ±0.05 g | |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | ±1 g | 0.0625 | ±0.015 g | 0.004 g |
| | | | | | excluding a datum error of ±0.05 g | |
| 17 | Lateral acceleration (Note 8) | Application for type certification submitted to a Contracting State before 1 January 2016 | ±1 g | 0.25 | ±0.015 g | 0.004 g |
| | | | | | excluding a datum error of ±0.05 g | |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | ±1 g | 0.0625 | ±0.015 g excluding a | 0.004 g |
| | | | | | datum error of ±0.05 g | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---|-------------------|---|--|------------------------------------|
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) (Notes 4 and 8) | Application for type certification submitted to a Contracting State before 1 January 2016 | Full range | 0.25 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |

| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | Full range | 0.125 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
|-----|--|--|---------------------------------------|-------|--|--|
| 19 | Pitch trim position | | Full range | 1 | ±3% unless higher accuracy uniquely required | 0.3% of full range or as installed |
| 20* | Radio altitude | | −6 m to 750 m (−20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 21* | Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 22* | Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 23 | Marker beacon passage | | Discrete | 1 | | |
| 24 | Master warning | | Discrete | 1 | | |
| 25 | Each NAV receiver frequency selection (<i>Note 5</i>) | | Full range | 4 | As installed | |

| Serial number | Parameter | Applicability | Measurement range | Accuracy limits (sensor sampling and input recording interval compared to FDR readout) | | Recording resolution |
|---------------|--|---------------|--|--|---|----------------------|
| | | | | (seconds) | | |
| 26* | DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/ IAN)) <i>(Notes 5 and 6)</i> | | 0 – 370 km (0 – 200 NM) | 4 | As installed | 1 852 m (1 NM) |
| 27 | Air/ground status | | Discrete | 1 | | |
| 28* | GPWS/TAWS/ GCA S status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) | | Discrete | 1 | | |
| 29* | Angle of attack | | Full range | 0.5 | As installed | 0.3 % of full range |
| 30* | Hydraulics, each system (low pressure) | | Discrete | 2 | | 0.5% of full range |
| 31* | Navigation data (latitude/longitude, ground speed and drift angle) <i>(Note 7)</i> | | As installed | 1 | As installed | |
| 32* | Landing gear and gear selector position | | Discrete | 4 | As installed | |
| 33* | Groundspeed | | As installed | 1 | Data should be obtained from the most accurate system | 1 kt |
| 34 | Brakes (left and right brake pressure, left and right brake pedal position) | | (Maximum metered brake range, discretised or full range) | 1 | ±5% | 2% of full range |

| Serial number | Parameter | Applicability | Measurement range | Accuracy | | |
|---------------|--|--|-------------------|---|---|--|
| | | | | Maximum sampling and recording interval (seconds) | limits (sensor input compared to FDR readout) | Recording resolution |
| 35* | Additional engine parameters (EPR, N ₁ , indicated vibration level, N ₂ , EGT, fuel flow, fuel cut-off lever position, N ₃ , engine fuel metering valve position) | Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | Each engine each second | As installed | 2% of full range |
| 36* | TCAS/ACAS (traffic alert and collision avoidance system) | | Discretes | 1 | As installed | |
| 37* | Wind shear warning | | Discrete | 1 | As installed | |
| 38* | Selected barometric setting (pilot, co-pilot) | | As installed | 64 | As installed | 0.1 mb (0.01 in-Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |

| | | | | | |
|-----|--|--------------|----|--------------|---|
| 44* | Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN)) | | 1 | As installed | |
| 45* | Selected decision height | As installed | 64 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot, co-pilot) | Discrete(s) | 4 | As installed | |
| 47* | Multi- function/ engine/alert s display format | Discrete(s) | 4 | As installed | |
| 48* | AC electrical bus status | Discrete(s) | 4 | As installed | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy | |
|------------------|----------------------------------|---------------|----------------------|---|--|-------------------------|
| | | | | | limits (sensor input compared to FDR readout) | Recording resolution |
| 49* | DC electrical bus status | | Discrete(s) | 4 | As installed | |
| 50* | Engine bleed valve position | | Discrete(s) | 4 | As installed | |
| 51* | APU bleed valve position | | Discrete(s) | 4 | As installed | |
| 52* | Computer failure | | Discrete(s) | 4 | As installed | |
| 53* | Engine thrust command | | As installed | 2 | As installed | |
| 54* | Engine thrust target | | As installed | 4 | As installed | 2% of full range |
| 55* | Computed centre of gravity | | As installed | 64 | As installed | 1% of full range |
| 56* | Fuel quantity in CG trim tank | | As installed | 64 | As installed | 1% of full range |
| 57* | Head up display in use | | As installed | 4 | As installed | |

| | | | | | |
|-----|---|--------------|---|--|--------------------|
| 58* | Para visual display on/off | As installed | 1 | As installed | |
| 59* | Operational stall protection, stick shaker and pusher activation | As installed | 1 | As installed | |
| 60* | Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer) | As installed | 4 | As installed | |
| 61* | glideslope) face detection | As installed | 4 | As installed | |
| 62* | Engine warning each engine vibration | As installed | 1 | As installed | |
| 63* | Engine warning each engine over temperature | As installed | 1 | As installed | |
| 64* | Engine warning each engine oil pressure low | As installed | 1 | As installed | |
| 65* | Engine warning each engine over speed | As installed | 1 | As installed | |
| 66* | Yaw trim surface position | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |

| Serial number | Parameter | Applicability | Measurement range | Accuracy limits | | |
|---------------|----------------------------|---------------|-------------------|---|--|--------------------|
| | | | | Maximum (sensor sampling interval (seconds) recording and to FDR readout) | Recording resolution | |
| 67* | Roll trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 68* | Yaw or sideslip angle | | Full range | 1 | ±5% | 0.5° |

| | | | | | | |
|-----|---|--|---|------|--------------------------------------|------------------------------------|
| 69* | De-icing and/or anti-icing systems selection | | Discrete(s) | 4 | | |
| 70* | Hydraulic pressure (each system) | | Full range | 2 | ±5% | 100 psi |
| 71* | Loss of cabin pressure | | Discrete | 1 | | |
| 72* | Cockpit trim control input position, Pitch | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 73* | Cockpit trim control input position, Roll | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 74* | Cockpit trim control input position, Yaw | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 75* | All cockpit flight control input forces (control wheel, control column, rudder pedal) | | Full range (±311 N(±70 lbf), ±378 N(±85 lbf), ±734 N(±165 lbf)) | 1 | ±5% | 0.2% of full range or as installed |
| 76* | Event marker | | Discrete | 1 | | |
| 77* | Date | | 365 days | 64 | | |
| 78* | ANP or EPE or EPU | | As installed | 4 | As installed | |
| 79* | Cabin pressure altitude | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed (0 ft to 40 000 ft recommended) | 1 | As installed | 100 ft |
| 80* | Aeroplane computed weight | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 81* | Flight director command | Application for type certification submitted to a Contracting State on or after 1 January 2023 | Full range | 1 | ± 2° | 0.5° |
| 82* | Vertical speed | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 0.25 | As installed (32 ft/min recommended) | 16 ft/min |

Notes.—

1. V_{So} stalling speed or minimum steady flight speed in the landing configuration is in Section “Abbreviations and Symbols”.
2. V_D design diving speed.
3. Record sufficient inputs to determine power.
4. For aeroplanes with control systems in which movement of a control surface will back drive the pilot’s control, “or” applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot’s control, “and” applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.
5. If signal available in digital form.
6. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.
7. If signals readily available.
8. It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording interval, accuracy limits or recording resolution description detailed in this Schedule.

TABLE A8-2. DESCRIPTION OF APPLICATIONS FOR DATA LINK RECORDERS

| Item No. | Application type | Application description | Recording content |
|----------|--------------------------------|--|-------------------|
| 1 | Data link initiation | This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively. | C |
| 2 | Controller/pilot communication | This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances. | C |
| 3 | Addressed surveillance | This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | C |
| 4 | Flight information | This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services. | C |

| | | | | |
|---|---------------------------------------|---|---|---|
| 5 | Aircraft broadcast surveillance | This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the aeroplane are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | M | * |
| 6 | Aeronautical operational control data | This includes any application transmitting or receiving data used for aeronautical operational control purposes. | M | * |

Key:

C: Complete contents recorded.

M: Information that enables correlation to any associated records stored separately from the aeroplane.

*: Applications to be recorded only as far as is practicable given the architecture of the system.

Table A8-3. Parameter Characteristics for Aircraft Data Recording Systems

| | Minimum | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | | |
|----|--|---|----------------------------|---|-------------------------------------|---|
| 1 | Heading | | | | | |
| a) | Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | Heading is preferred, if not available, yaw rate shall be recorded |
| b) | Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch | | | | | |
| a) | Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | Pitch attitude is preferred, if not available, pitch rate shall be recorded |
| b) | Pitch rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll | | | | | |
| a) | Roll attitude | ±180° | 0.25 | ±2° | 0.5° | Roll attitude is preferred, if not available, roll rate shall be recorded |
| b) | Roll rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| a) | Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available. |
| b) | Latitude/longitude | Latitude:±90° Longitude:±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| c) | Altitude | -300 m (-1 000 ft) to maximum certified altitude of aeroplane +1 500 m (5 000 ft) | 2 (1 if available) | As installed | 1.5 m (5 ft) | |
| d) | Ground speed | 0-1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |
| e) | Track | 0-360° | 2 (1 if available) | As installed (± 2° recommended) | 0.5° | |
| f) | Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | -3 g to + 6 g (*) | 0.25 (0.125 if available) | As installed (± 0.09 g excluding a datum error of ±0.45 g recommended) | 0.004 g | |
| 6 | Longitudinal Acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended) | 0.1 mb (0.01 in-Hg) or 1.5 m (5 ft) | |
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |

| | | | | | | |
|----|--|---|-----------------------------|---|---------------------------|--|
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3 % recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Engine RPM | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | |
| 12 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 13 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 15 | Manifold pressure | Full range | Each engine each second | As installed | 0.2% of full range | |
| 16 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | * Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided. |
| 17 | Engine gas generator speed (Ng) | 0-150% | Each engine each second | As installed | 0.2% of full range | |
| 18 | Free power turbine speed (Nf) | 0-150% | Each engine each second | As installed | 0.2% of full range | |
| 19 | Coolant temperature | Full range | 1 | As installed (±5°C recommended) | 1° C | |
| 20 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 21 | Cylinder head temperature | Full range | Each cylinder each second | As installed | 2% of full range | |
| 22 | Flaps position | Full range or each discrete position | 2 | As installed | 0.5° | |
| 23 | Primary flight control surface position | Full range | 0.25 | As installed | 0.2 % of full range | |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | * Where available, record up-and- locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

Table A8-3. Parameter Characteristics for Aircraft Data Recording Systems

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|-------------------------------|--|---------------------------------------|--|------------------------------|---|
| 1 | Heading | | | | | |
| | a) Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | Heading is preferred, if not available, yaw rate shall be recorded |
| | b) Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch | | | | | |
| | a) Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | Pitch attitude is preferred, if not available, pitch rate shall be recorded |
| | b) Pitch rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll | | | | | |
| | a) Roll attitude | ±180° | 0.25 | ±2° | 0.5° | Roll attitude is preferred, if not available, roll rate shall be recorded |
| | b) Roll rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| | a) Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available. |
| | b) Latitude/longitude | Latitude:±90° Longitude:±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| | c) Altitude | -300 m (-1 000 ft) to maximum certificated | 2 (1 if available) | As installed (±15 m (±50 ft) | 1.5 m (5 ft) | |

| | | | | | | |
|----|------------------------------|--|--|---|--------------|---|
| | | altitude of aeroplane +1 500 m (5 000 ft) | | recommended) | | |
| d) | Ground speed | 0–1 000 kt | 2 | As installed | 1 kt | |
| e) | Track | 0–360° | (1 if available) 2 | (±5 kt recommended) As installed | 0.5° | |
| f) | Estimated error | Available range | (1 if available) 2 | (± 2° recommended) As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | –3 g to + 6 g (*) | (1 if available) 0.25 (0.125 if available) | As installed (± 0.09 g excluding a datum error of ±0.45 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|---|--|--|---|---|---------|
| 7 | Lateral acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.1 in- Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended) | 0.1 mb (0.01 in-Hg) or 1.5 m (5 ft) | |

| | | | | | | |
|----|---|---|-------------------------|---|---------------------------|--|
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3 % recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Engine RPM | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | |
| 12 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 13 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 15 | Manifold pressure | Full range | Each engine each second | As installed | 0.2% of full range | |
| 16 | Engine thrust/ power/ torque parameters required to determine propulsive thrust/ power* | Full range | Each engine each second | As installed | 0.1% of full range | * Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided. |

| | | | | | |
|----|---------------------------------|--------------------------------------|---------------------------|---------------------------------|--------------------|
| 17 | Engine gas generator speed (Ng) | 0-150% | Each engine each second | As installed | 0.2% of full range |
| 18 | Free power turbine speed (Nf) | 0-150% | Each engine each second | As installed | 0.2% of full range |
| 19 | Coolant temperature | Full range | 1 | As installed (±5°C recommended) | 1° C |
| 20 | Main voltage | Full range | Each engine each second | As installed | 1 Volt |
| 21 | Cylinder head temperature | Full range | Each cylinder each second | As installed | 2% of full range |
| 22 | Flaps position | Full range or each discrete position | 2 | As installed | 0.5° |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|---|--------------------------------------|---------------------------------------|----------------------------|------------------------------|---|
| 23 | Primary flight control surface position | Full range | 0.25 | As installed | 0.2 % of full range | |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | * Where available, record up-and- locked and down- and- locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

SCHEDULE 3

Regulations 57(2),(3) and 95(b)

LIGHTS TO BE DISPLAYED BY AEROPLANE (COMMERCIAL AIR TRANSPORT — AEROPLANES)

1. TERMINOLOGY

In this Schedule, unless the context otherwise requires—

“angles of coverage” includes-

- (a) angle of coverage A which is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis;
- (b) angle of coverage F which is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis;
- (c) angle of coverage L which is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis;
- (d) angle of coverage R which is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis;

“horizontal plane” means the plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane;

“longitudinal axis of the aeroplane” means a selected axis parallel to the direction of flight at a normal cruising speed and passing through the centre of gravity of the aeroplane;

“making way” an aeroplane on the surface of the water is “making way” when it is under way and has a velocity relative to the water;

‘under command’ an aeroplane on the surface of the water is “under command” when it is able to execute manoeuvres as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels;

“under way” an aeroplane on the surface of the water is “under way” when it is not aground or moored to the ground or to any fixed object on the land or in the water;

‘vertical planes’ means planes perpendicular to the horizontal plane;

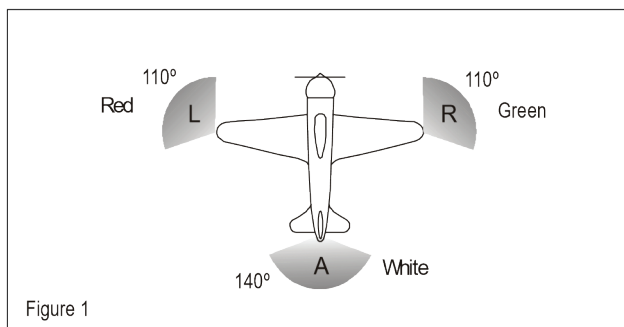
“visible” means visible on a dark night with a clear atmosphere.

2. NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

Note. — *The lights specified in this paragraph are intended to meet the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 for navigation lights.*

As illustrated in Figure 1 below, the following unobstructed navigation lights shall be displayed—

- (a) a red light projected above and below the horizontal plane through angle of coverage L;
- (b) a green light projected above and below the horizontal plane through angle of coverage R;
- (c) a white light projected above and below the horizontal plane rearward through angle of coverage A.



3. LIGHTS TO BE DISPLAYED ON THE WATER

(1) General

Note. — The lights specified in this paragraph are intended to meet the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 for lights to be displayed by aeroplanes on the water.

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following circumstances-

- (a) when under way;
- (b) when towing another vessel or aeroplane;
- (c) when being towed;
- (d) when not under command and not making way;
- (e) when making way but not under command;
- (f) when at anchor;
- (g) when aground.

The lights required by aeroplanes in each case are described below.

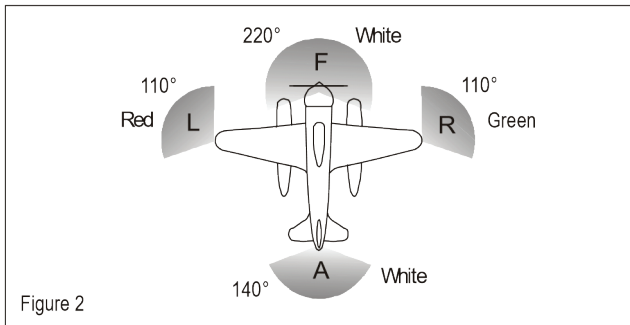
(2) When under way

As illustrated in Figure 2 below, the following appearing as steady unobstructed lights—

- (a) a red light projected above and below the horizontal through angle of coverage L;

- (b) a green light projected above and below the horizontal through angle of coverage R;
- (c) a white light projected above and below the horizontal through angle of coverage A; and
- (d) a white light projected through angle of coverage F.

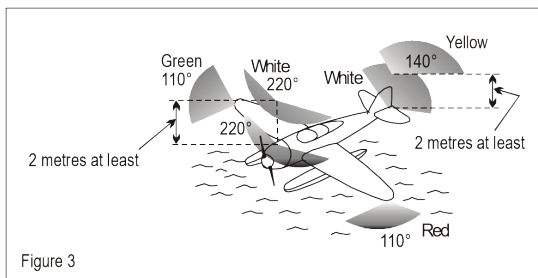
The lights described in paragraph 3(2) (a), (b) and (c) shall be visible at a distance of at least 3.7 km (2 NM). The light described in paragraph 3(2) (d) shall be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.



(3) When towing another vessel or aeroplane

As illustrated in Figure 3 below, the following appearing as steady, unobstructed lights—

- (a) the lights described in paragraph 3(2);
- (b) a second light having the same characteristics as the light described in paragraph 3(2) (d) and mounted in a vertical line at least 2 m above or below it; and
- (c) a yellow light having otherwise the same characteristics as the light described in paragraph 3 (2) (c) and mounted in a vertical line at least 2 m above it.

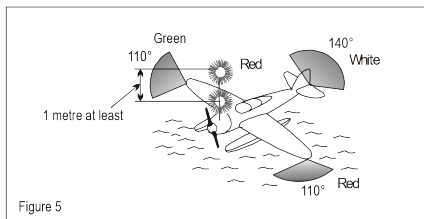
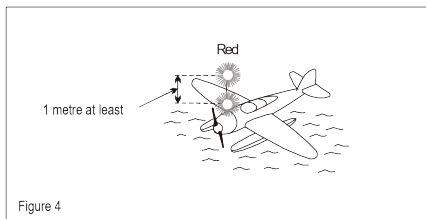


(4) When being towed

The lights described in paragraph 3 (2) (a), (b) and (c) appearing as steady, unobstructed lights.

(5) When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).



(6) When making way but not under command

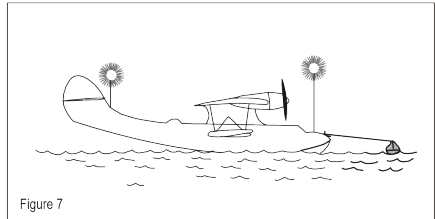
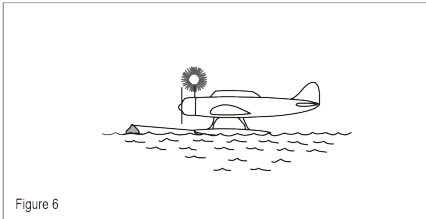
As illustrated in Figure 5, the lights described in paragraph 3(5) plus the lights described in paragraph 3(2) (a), (b) and (c).

Note. — The display of lights prescribed in paragraphs 3(5) and 3(6) is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.

(7) When at anchor

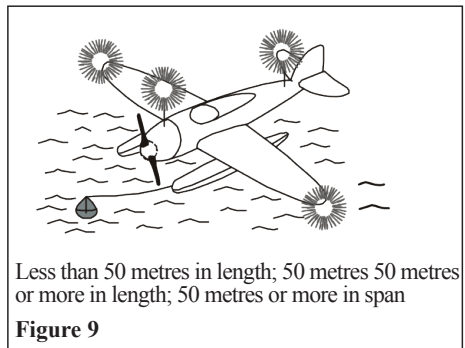
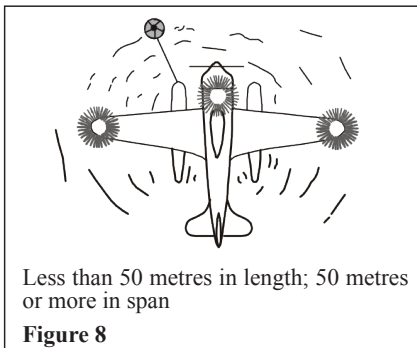
- (a) If less than 50 m in length, where it can best be seen, a steady white light as shown in Figure 6, visible all around the horizon at a distance of at least 3.7 km (2 NM).

- (b) If 50m or more in length, where they can best be seen, a steady white forward light and a steady white rear light as shown in Figure 7 both visible all around the horizon at a distance of at least 5.6 km (3 NM).
- (c) If 50 m or more in span a steady white light on each side as shown in Figures 8 and 9 to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).



(8) When aground

The lights prescribed in paragraph 3(7) and in addition two steady red lights in vertical line, at least 1m apart so placed as to be visible all around the horizon.



SCHEDULE 4

Regulation 79

ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE (COMMERCIAL AIR TRANSPORT — AEROPLANES)

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80 ft) in magnitude and shall have a standard deviation no greater than $28 - 0.013z^2$ for $0 \leq z \leq 25$ when z is the magnitude of the mean TVE in metres, or $92 - 0.004z^2$ for $0 \leq z \leq 80$ where z is in feet. In addition, the components of TVE shall have the following characteristics—

- (a) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude;
- (b) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft); and
- (c) the differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

2. In respect of aeroplanes for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aeroplanes encompassed by paragraph 1, the height-keeping performance capability shall be such that the components of the TVE of the aeroplane have the following characteristics—

- (a) the ASE of the aeroplane shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and

- (b) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

SCHEDULE 5

Regulation 94

LIGHTS TO BE DISPLAYED BY AEROPLANE (GENERAL AVIATION — AEROPLANES)

1. TERMINOLOGY

In this Schedule, unless the context otherwise requires—

“angles of coverage” includes—

- (a) angle of coverage A that is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis;
- (b) angle of coverage F that is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis;
- (c) angle of coverage L that is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis;
- (d) angle of coverage R that is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

“horizontal plane” means the plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane;

“longitudinal axis of the aeroplane” means a selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the aeroplane;

“making way” in relation to an aeroplane on the surface of the water, means, when the aeroplane is under way and has a velocity relative to the water;

“under command” in relation to an aeroplane on the surface of the water means when the aeroplane is able to execute manoeuvres as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

“under way” in relation to an aeroplane on the surface of the water, means, when the aeroplane is not aground or moored to the ground or to any fixed object on the land or in the water;

“vertical planes” means planes perpendicular to the horizontal plane;

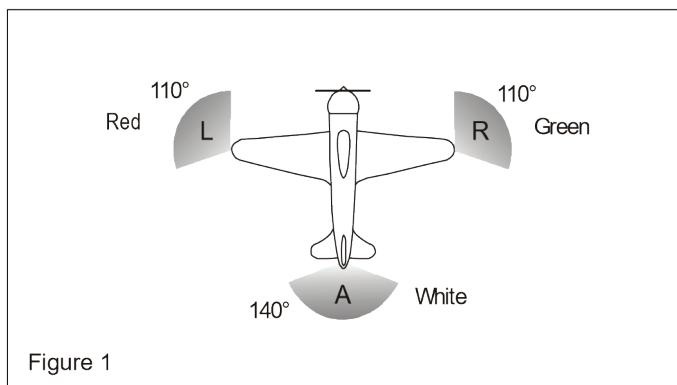
“visible” means visible on a dark night with a clear atmosphere.

2. NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

Note.— The lights specified herein are intended to meet the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 for navigation lights.

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed—

- (a) a red light projected above and below the horizontal plane through angle of coverage L;
- (b) a green light projected above and below the horizontal plane through angle of coverage R;
- (c) a white light projected above and below the horizontal plane rearward through angle of coverage A.



3. LIGHTS TO BE DISPLAYED ON THE WATER

3.1 GENERAL

Note.— The lights specified herein are intended to meet the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 for lights to be displayed by aeroplanes on the water.

The *International Regulations for Preventing Collisions at Sea* require different lights to be displayed in each of the following circumstances—

- (a) when under way;
- (b) when towing another vessel or aeroplane;
- (c) when being towed;
- (d) when not under command and not making way;
- (e) when making way but not under command;
- (f) when at anchor;
- (g) when aground.

The lights required by aeroplanes in each case are described below.

(1) When under way

As illustrated in Figure 2, the following appearing as steady, unobstructed lights—

- (a) a red light projected above and below the horizontal through angle of coverage L;
- (b) a green light projected above and below the horizontal through angle of coverage R;
- (c) a white light projected above and below the horizontal through angle of coverage A; and
- (d) a white light projected through angle of coverage F.

The lights described in (a), (b) and (c) shall be visible at a distance of at least 3.7 km (2 NM). The light described in (d) shall be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

(2) When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights—

- (a) the lights described in paragraph (1);
- (b) a second light having the same characteristics as the light described in paragraph (1);
- (c) mounted in a vertical line at least 2 m above or below it; and
- (d) a yellow light having otherwise the same characteristics as the light described in subparagraph (c) and mounted in a vertical line at least 2 m above it.

(3) When being towed

The lights described in paragraph (2) (a), (b) and (c) appearing as steady, unobstructed lights.

(4) When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

(5) When making way but not under command

As illustrated in Figure 5, the lights described in subparagraph (4) plus the lights described in subparagraph (2) (a), (b) and (c).

Note. — The display of lights prescribed in subparagraph (4) and (5) is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.

(6) When at anchor

- (a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).
- (b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).

- (c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).

(7) When aground

The lights prescribed in subparagraph (6) and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon.

SCHEDULE 6

Regulations 102, 103, 109, 114 and 130

FLIGHT RECORDERS (GENERAL AVIATION — AEROPLANES)

The material in this Schedule applies to flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following—

- (a) a flight data recorder (FDR);
- (b) a cockpit voice recorder (CVR);
- (c) an airborne image recorder (AIR);
- (d) a data link recorder (DLR);

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following—

- (a) an aircraft data recording system (ADRS);
- (b) a cockpit audio recording system (CARS);
- (c) an airborne image recording system (AIRS);
- (d) a data link recording system (DLRS).

When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS.

1.2 GENERAL REQUIREMENTS

- (1) Non-deployable flight recorder containers shall be painted a distinctive orange colour.
- (2) Non-deployable crash-protected flight recorder containers shall—
 - (a) carry reflective material to facilitate their location; and
 - (b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kilohertz (kHz).

At the earliest practical date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

- (3) Automatic deployable flight recorder containers shall—
 - (a) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;
 - (b) carry reflective material to facilitate their location; and
 - (c) have an integrated automatically activated ELT.
- (4) The flight recorder systems shall be installed so that—
 - (a) the probability of damage to the recordings is minimized;
 - (b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and
 - (c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and
 - (d) aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note.— The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.

- (5) The crash-protected flight recorder shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder without jeopardizing service to essential or emergency loads.
- (6) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

- (7) The flight recorder systems, when tested by methods approved by the Authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.
- (8) Means shall be provided for an accurate time correlation between the recorder systems recordings.
- (9) The manufacturer shall provide the authority with the following information in respect of the flight recorder systems—
 - (a) manufacturer's operating instructions, equipment limitations and installation procedures;
 - (b) parameter origin or source and equations which relate counts to units of measurement; and
 - (c) manufacturer's test reports.

2. FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEM (ADRS)

2.1 START AND STOP LOGIC

The FDR or ADRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power.

2.2 PARAMETERS TO BE RECORDED

- (1) The parameters that satisfy the requirements for FDRs are the first 7 parameters listed in Table A2.3-1. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

- (2) Where further FDR recording capacity is available, recording of the following additional information shall be considered-
- (a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority—
 - (i) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;
 - (ii) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY;
 - (iii) warnings and alerts; and
 - (iv) the identity of displayed pages for emergency procedures and checklists;
 - (b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.
- (3) The parameters that satisfy the recommendations for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) are to be recorded if an information source for the parameter is displayed to the pilot and is practicable to record—
- (a) pressure altitude;
 - (b) indicated airspeed or calibrated airspeed;
 - (c) heading (primary flight crew reference);
 - (d) pitch attitude;
 - (e) roll attitude;
 - (f) engine thrust/power;
 - (g) landing gear status*;

- (h) total or outside air temperature*;
 - (i) time*;
 - (j) navigation data*: Drift angle, wind speed, wind direction, latitude/longitude;
 - (k) radio altitude*.
- (4) The parameters that satisfy the requirements for ADRS are listed in Table A2.3-3.
- (5) Where further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A2.3-3 shall be considered.

2.3 ADDITIONAL INFORMATION

- (1) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.
- (2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3. COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)

3.1 START AND STOP LOGIC

The CVR or CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 SIGNALS TO BE RECORDED

- (1) The CVR shall record simultaneously on four separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the aeroplane by radio;
 - (b) aural environment on the flight deck;
 - (c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed;
 - (d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and
 - (e) digital communications with ATS, unless recorded by the FDR.
- (2) The preferred CVR audio allocation shall be as follows—
 - (a) pilot-in-command audio panel;
 - (b) co-pilot audio panel;
 - (c) additional flight crew positions and time reference; and
 - (d) cockpit area microphone.
- (3) The CARS shall record simultaneously on two separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the aeroplane by radio;
 - (b) aural environment on the flight deck; and
 - (c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed.
- (4) The preferred CARS audio allocation shall be as follows—
 - (a) voice communication; and
 - (b) aural environment on the flight deck.

4. AIRBORNE IMAGE RECORDER (AIR) AND AIRBORNE IMAGE RECORDING SYSTEM (AIRS)

4.1 Start and stop logic

The AIR or AIRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

4.2 Classes

- (1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1.—To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2.— There are no provisions for Class A AIR or AIRS in this document.

- (2) A Class B AIR or AIRS captures data link message displays.
- (3) A Class C AIR or AIRS captures instruments and control panels.

Note.— A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.

5. DATA LINK RECORDER (DLR)

5.1 Applications to be recorded

- (1) Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note.— Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.

- (2) Messages applying to the applications listed in Table A2.3-2 shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

6. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

- (1) Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.
- (2) FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.
- (3) Recording inspections shall be carried out as follows—
 - (a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
 - (b) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

- (c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
 - (d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;
 - (e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and
 - (f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.
 - (g) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.
- (4) A flight recorder system shall be considered unserviceable where there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.
- (5) A report of the recording inspection shall be made available on request to regulatory authorities for monitoring purposes.
- (6) Calibration of the FDR system—
- (a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters, and to ensure that parameters are being recorded within the calibration tolerances; and
 - (b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall

be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

TABLE A2.3-1 PARAMETER CHARACTERISTICS FOR FLIGHT DATA RECORDERS

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---------------|--|---|--|---|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure altitude | | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed or calibrated airspeed | | 95 km/h (50 kt) to max V_{S_0} (Note 1) V_{S_0} to 1.2 V_D (Note 2) | 1 | ±5% ±3% | 1 kt (0.5 kt recommended) |
| 4 | Heading (primary flight crew reference) | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration | | -3 g to +6 g | 0.125 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |
| 6 | Pitch attitude | | ±75° or usable range whichever is greater | 0.25 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.25 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | | |
| 9 | Power on each engine (Note 3) | | Full range | 1 (per engine) | ±2% | 0.2% of full range or the resolution required to operate the aircraft |
| 10* | Trailing edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|--|--------------------------------------|---|--|--|
| 11* | Leading edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 12* | Thrust reverser position | | Stowed, in transit, and reverse | 1 (per engine) | | |
| 13* | Ground spoiler/speed brake selection (selection and position) | | Full range or each discrete position | 1 | ±2% unless higher accuracy uniquely required | 0.2% of full range |
| 14 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 15* | Autopilot/auto throttle/AFCS mode and engagement status | | A suitable combination of discretets | 1 | | |
| 16 | Longitudinal acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 17 | Lateral acceleration (Note 3) | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) (Notes 4 and 8) | Application for type certification submitted to a Contracting State before 1 January 2016 | Full range | 0.25 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | Full range | 0.125 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
| 19 | Pitch trim position | | Full range | 1 | ±3% unless higher accuracy uniquely required | 0.3% of full range or as installed |
| 20* | Radio altitude | | -6 m to 750 m (-20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|---------------------|---|--|----------------------|
| 21* | Vertical beam deviation (ILS/GNSS/GLS glide path MLS elevation, IRNAV/IAN vertical deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 22* | Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 23 | Marker beacon passage | | Discrete | 1 | | |
| 24 | Master warning | | Discrete | 1 | | |
| 25 | Each NAV receiver frequency selection (Note 5) | | Full range | 4 | As installed | |
| 26* | DME 1 and 2 distance (includes distance to runway threshold (GLS) and distance to missed approach point (IRNAV/IAN) (Notes 5 and 6) | | 0–370 km (0–200 NM) | 4 | As installed | 1 852 m (1 NM) |
| 27 | Air/ground status | | Discrete | 1 | | |
| 28* | GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) | | Discrete | 1 | | |
| 29* | Angle of attack | | Full range | 0.5 | As installed | 0.3% of full range |
| 30* | Hydraulics, each system (low pressure) | | Discrete | 2 | | 0.5% of full range |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|--|--|---|--|--|
| 31* | Navigation data (latitude/longitude, ground speed and drift angle) (Note 7) | | As installed | 1 | As installed | |
| 32* | Landing gear and gear selector position | | Discrete | 4 | As installed | |
| 33* | Groundspeed | | As installed | 1 | Data should be obtained from the most accurate system | 1 kt |
| 34 | Brakes (left and right brake pressure, left and right brake pedal position) | | (Maximum metered brake range, discretises or full range) | 1 | ±5% | 2% of full range |
| 35* | Additional engine parameters (EPR, N ₁ , indicated vibration level, N ₂ , EGT, fuel flow, fuel cut-off lever position, N ₃ engine fuel metering valve position) | Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | Each engine each second | As installed | 2% of full range |
| 36* | TCAS/ACAS (traffic alert and collision avoidance system) | | Discrete(s) | 1 | As installed | |
| 37* | Wind shear warning | | Discrete | 1 | As installed | |
| 38* | Selected barometric setting (pilot, co-pilot) | | As installed | 64 | As installed | 0.1 mb (0.01 in-Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---------------|-------------------|---|--|--|
| 44* | Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN)) | | | 1 | As installed | As installed |
| 45* | Selected decision height | | As installed | 64 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot, co-pilot) | | Discrete(s) | 4 | As installed | |
| 47* | Multi-function/engine/alerts display format | | Discrete(s) | 4 | As installed | |
| 48* | AC electrical bus status | | Discrete(s) | 4 | As installed | |
| 49* | DC electrical bus status | | Discrete(s) | 4 | As installed | |
| 50* | Engine bleed valve position | | Discrete(s) | 4 | As installed | |
| 51* | APU bleed valve position | | Discrete(s) | 4 | As installed | |
| 52* | Computer failure | | Discrete(s) | 4 | As installed | |
| 53* | Engine thrust command | | As installed | 2 | As installed | 2% of full range |
| 54* | Engine thrust target | | As installed | 4 | As installed | 2% of full range |
| 55* | Computed centre of gravity | | As installed | 64 | As installed | 1% of full range |
| 56* | Fuel quantity in CG trim tank | | As installed | 64 | As installed | 1% of full range |
| 57* | Head-up display in use | | As installed | 4 | As installed | |
| 58* | Para-visual display on/off | | As installed | 1 | As installed | |
| 59* | Operational stall protection, stick shaker and pusher activation | | As installed | 1 | As installed | |
| 60* | Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glide slope) | | As installed | 4 | As installed | |
| 61* | Ice detection | | As installed | 4 | As installed | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|--|---|--|------------------------------------|
| 62* | Engine warning each engine vibration | | As installed | 1 | As installed | |
| 63* | Engine warning each engine over temperature | | As installed | 1 | As installed | |
| 64* | Engine warning each engine oil pressure low | | As installed | 1 | As installed | |
| 65* | Engine warning each engine over speed | | As installed | 1 | As installed | |
| 66* | Yaw trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 67* | Roll trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 68* | Yaw or sideslip angle | | Full range | 1 | ±5% | 0.5° |
| 69* | De-icing and/or anti-icing systems selection | | Discrete(s) | 4 | | |
| 70* | Hydraulic pressure (each system) | | Full range | 2 | ±5% | 100 psi |
| 71* | Loss of cabin pressure | | Discrete | 1 | | |
| 72* | Cockpit trim control input position, Pitch | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 73* | Cockpit trim control input position, Roll | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 74* | Cockpit trim control input position, Yaw | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 75 | All cockpit flight control input forces (control wheel, control column, rudder pedal) | | Full range (±311 N (±70 lbf), ±378 N (±85 lbf), ±734 N (±165 lbf)) | 1 | ±5% | 0.2% of full range or as installed |
| 76* | Event marker | | Discrete | 1 | | |
| 77* | Date | | 365 days | 64 | | |
| 78* | Actual navigation performance or estimated position error or estimated position uncertainty | | As installed | 4 | As installed | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|--|--|---|--|----------------------|
| 79* | Cabin pressure altitude | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed (0 ft to 40 000 ft recommended) | 1 | As installed | 100 ft |
| 80* | Aeroplane computed weight | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 81* | Flight director command (left flight director pitch command, left flight director roll command, right flight director pitch command, right flight director roll command) | Application for type certification submitted to a Contracting State on or after 1 January 2023 | Full range | 1 | ± 2° | 0.5° |
| 82* | Vertical speed | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 0.25 | As installed (32 ft/min recommended) | 16 ft/min |

Notes.—

1. V_s *stalling speed or minimum steady flight speed in the landing configuration is in Section “Abbreviations and Symbols”.*
2. V_D *design diving speed.*
3. *Record sufficient inputs to determine power.*
4. *For aeroplanes with control systems in which movement of a control surface will back drive the pilot’s control, “or” applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot’s control, “and” applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.*

5. *If signal available in digital form.*
6. *Recording of latitude and longitude from INS or other navigation system is a preferred alternative.*
7. *If signals readily available.*
8. *It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording intervals, accuracy limits or recording resolution guidance description detailed in this Schedule.*

Table A2.3-1 Parameter characteristics for flight data recorders

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---------------|---|---|--|---|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure altitude | | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed or calibrated airspeed | | 95 km/h (50 kt) to max V_{S_0} (Note 1) V_{S_0} to 1.2 V_D (Note 2) | 1 | ±5% ±3% | 1 kt (0.5 kt recommended) |
| 4 | Heading (primary flight crew reference) | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration | | -3 g to +6 g | 0.125 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |
| 6 | Pitch attitude | | ±75° or usable range whichever is greater | 0.25 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.25 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | | |
| 9 | Power on each engine (Note 3) | | Full range | 1 (per engine) | ±2% | 0.2% of full range or the resolution required to operate the aircraft |
| 10* | Trailing edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|--|--------------------------------------|---|--|---|
| 11* | Leading edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 12* | Thrust reverser position | | Stowed, in transit, and reverse | 1 (per engine) | | |
| 13* | Ground spoiler/speed brake selection (selection and position) | | Full range or each discrete position | 1 | ±2% unless higher accuracy uniquely required | 0.2% of full range |
| 14 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 15* | Autopilot/auto throttle/AFCS mode and engagement status | | A suitable combination of discretely | 1 | | |
| 16 | Longitudinal acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 17 | Lateral acceleration (Note 3) | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) (Notes 4 and 8) | Application for type certification submitted to a Contracting State before 1 January 2016 | Full range | 0.25 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
| | | Application for type certification submitted to a Contracting State on or after 1 January 2016 | Full range | 0.125 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |

| | | | | | |
|-----|---------------------|-----------------------------------|---|--|--|
| 19 | Pitch trim position | Full range | 1 | ±3% unless higher accuracy uniquely required as installed | 0.3% of full range or |
| 20* | Radio altitude | -6 m to 750 m (-20 ft to 2500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---------------|---------------------|---|--|----------------------|
| 21* | Vertical beam deviation (ILS/GNSS/GLS glide path MLS elevation, IRNAV/IAN vertical deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 22* | Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 23 | Marker beacon passage | | Discrete | 1 | | |
| 24 | Master warning | | Discrete | 1 | | |
| 25 | Each NAV receiver frequency selection (Note 5) | | Full range | 4 | As installed | |
| 26* | DME 1 and 2 distance (includes distance to runway threshold (GLS) and distance to missed approach point) | | 0-370 km (0-200 NM) | 4 | As installed | 1 852 m (1 NM) |

| | | | | | | |
|-----|---|------------|-----|--------------|-----------------------|--|
| | (IRNAV/IAN) (Notes 5 and 6) | | | | | |
| 27 | Air/ground status | Discrete | 1 | | | |
| 28* | GPWS/TAWS/ GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) | Discrete | 1 | | | |
| 29* | Angle of attack | Full range | 0.5 | As installed | 0.3% of full range | |
| 30* | Hydraulics, each system (low pres- sure) | Discrete | 2 | | 0.5% of full range | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|------------------|--|---------------|----------------------|---|---|-------------------------|
| 31* | Navigation data (latitude/longitude, ground speed and drift angle) (Note 7) | | As installed | 1 | As installed | |
| 32* | Landing gear and gear selector position | | Discrete | 4 | As installed | |
| 33* | Groundspeed | | As installed | 1 | Data should be 1 kt obtained from the most accurate | |
| 34 | Brakes (left and right) | | (Maximum metered | 1 | system ±5% | 2% of full |

| | | | | | | |
|-----|---|--|---|----------------------------|--------------|--|
| | brake pressure, left and right brake pedal position) | | brake range, discretes or full range) | | | range |
| 35* | Additional engine parameters (EPR, N ₁ , indicated vibration level, N ₂ , EGT, fuel flow, fuel cut-off lever. position, N ₃ engine fuel metering valve position) | Engine fuel metering valve position: Ap- plication for type certifica- tion is submitted to a Contracting State on or after 1 January 2023 | As installed | Each engine each second | As installed | 2% of full range |
| 36* | TCAS/ACAS (traffic alert and collision avoidance system) | | Discrete(s) | 1 | As installed | |
| 37* | Wind shear warning | | Discrete | 1 | As installed | |
| 38* | Selected barometric setting (pilot, co-pilot) | | As installed | 64 | As installed | 0.1 mb (0.01 in- Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed | | As installed | 1 | As installed | Sufficient to |

| | | | | | |
|-----|---|--------------|---|--------------|--------------------------|
| | (all pilot selectable modes of operation) | | | | determine crew selection |
| 43* | Selected heading | As installed | 1 | As installed | Sufficient to |
| | (all pilot selectable modes of operation) | | | | determine crew selection |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|-------------------|---|--|--|
| 44* | Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IR-NAV/IAN)) | | | 1 | As installed | As installed |
| 45* | Selected decision height | As installed | | 64 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot, co-pilot) | | Discrete(s) | 4 | As installed | |
| 47* | Multi- function/ engine/alerts display format | | Discrete(s) | 4 | As installed | |
| 48* | AC electrical bus status | | Discrete(s) | 4 | As installed | |
| 49* | DC electrical bus status | | Discrete(s) | 4 | As installed | |
| 50* | Engine bleed valve position | | Discrete(s) | 4 | As installed | |
| 51* | APU bleed valve position | | Discrete(s) | 4 | As installed | |
| 52* | Computer failure | | Discrete(s) | 4 | As installed | |
| 53* | Engine thrust command | As installed | | 2 | As installed | 2% of full range |
| 54* | Engine thrust target | As installed | | 4 | As installed | 2% of full range |

| | | | | | |
|-----|---|--------------|----|--------------|------------------|
| 55* | Computed centre of gravity | As installed | 64 | As installed | 1% of full range |
| 56* | Fuel quantity in CG trim tank | As installed | 64 | As installed | 1% of full range |
| 57* | Head-up display in use | As installed | 4 | As installed | |
| 58* | Para-visual display on/off | As installed | 1 | As installed | |
| 59* | Operational stall protection, stick shaker and pusher activation | As installed | 1 | As installed | |
| 60* | Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glide slope) | As installed | 4 | As installed | |
| 61* | Ice detection | As installed | 4 | As installed | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|-------------------|---|--|----------------------|
| 62* | Engine warning each engine vibration | | As installed | 1 | As installed | |
| 63* | Engine warning each engine over temperature | | As installed | 1 | As installed | |
| 64* | Engine warning each engine oil pressure low | | As installed | 1 | As installed | |
| 65* | Engine warning each engine over speed | | As installed | 1 | As installed | |
| 66* | Yaw trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely | 0.3% of full range |

| | | | | | |
|-----|---|--------------|----|--|------------------------------------|
| 67* | Roll trim surface position | Full range | 2 | required ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 68* | Yaw or sideslip angle | Full range | 1 | ±5% | 0.5° |
| 69* | De-icing and/or anti-icing systems selection | Discrete(s) | 4 | | |
| 70* | Hydraulic pressure (each system) | Full range | 2 | ±5% | 100 psi |
| 71* | Loss of cabin pressure | Discrete | 1 | | |
| 72* | Cockpit trim control input position, Pitch | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 73* | Cockpit trim control input position, Roll | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 74* | Cockpit trim control input position, Yaw | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 75 | All cockpit flight control input forces (control wheel, control column, rudder pedal) | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 76* | Event marker | Discrete | 1 | | |
| 77* | Date | 365 days | 64 | | |
| 78* | Actual navigation performance or estimated position error or estimated position uncertainty | As installed | 4 | As installed | |

| | | | | | | |
|-----|--|--|--|------|--------------------------------------|------------------|
| 79* | Cabin pressure altitude | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed (0 ft to 40 000 ft recommended) | 1 | As installed | 100 ft |
| 80* | Aeroplane computed weight | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 81* | Flight director command (left flight director pitch command, left flight director roll command, right flight director pitch command, right flight director roll command) | Application for type certification submitted to a Contracting State on or after 1 January 2023 | Full range | 1 | ± 2° | 0.5° |
| 82* | Vertical speed | Application for type certification submitted to a Contracting State on or after 1 January 2023 | As installed | 0.25 | As installed (32 ft/min recommended) | 16 ft/min |

Notes.—

1. V_{s0} stalling speed or minimum steady flight speed in the landing configuration is in Section “Abbreviations and Symbols”.
2. V_D design diving speed.
3. Record sufficient inputs to determine power.
4. For aeroplanes with control systems in which movement of a control surface will back drive the pilot’s control, “or” applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot’s control, “and” applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.
5. If signal available in digital form.
6. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.
7. If signals readily available.
8. It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording intervals, accuracy limits or recording

Table A2.3-2. Description of applications for data link recorders

| Item No. | Application type | Application description | Recording content |
|----------|---------------------------------------|--|-------------------|
| 1 | Data link initiation | This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM), respectively. | C |
| 2 | Controller-pilot communication | This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances. | C |
| 3 | Addressed surveillance | This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | C |
| 4 | Flight information | This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services. | C |
| 5 | Aircraft broadcast surveillance | This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the aeroplane are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | M* |
| 6 | Aeronautical operational control data | This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control). | M* |

Key:

C: Complete contents recorded.

M: Information that enables correlation to any associated records stored separately from the aeroplane.

*: Applications that are to be recorded only as far as is practicable given the architecture of the system.

TABLE A2.3-3. PARAMETER CHARACTERISTICS FOR AIRCRAFT DATA RECORDING SYSTEMS

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|-------------------------------|--|---------------------------------------|--|------------------------------|---|
| 1 | Heading: | | | | | |
| | a) Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | * Heading is preferred, if not available, yaw rate shall be recorded |
| | b) Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch: | | | | | |
| | a) Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | * Pitch altitude is preferred, if not available, pitch rate shall be recorded |
| | b) Pitch rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll: | | | | | |
| | a) Roll attitude | ±180° | 0.25 | ±2° | 0.5° | * If not available, roll rate shall be recorded |
| | b) Roll rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| | a) Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available |
| | b) Latitude/longitude | Latitude: ±90° Longitude: ±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| | c) Altitude | -300 m (-1 000 ft) to maximum certificated altitude of aircraft + 1 500 m (5 000 ft) | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |
| | d) Ground speed | 0-1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|---|---|---------------------------------------|---|---|--|
| | e) Track | 0-360° | 2 (1 if available) | As installed (±2° recommended) | 0.5° | |
| | f) Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | -3 g to +6 g (*) | 0.25 (0.125 if available) | As installed (±0.09 g excluding a datum error of ±0.45 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended) | 0.1 mb (0.01 in-Hg) or 1.5 m (5 ft) | |
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Engine RPM | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | |
| 12 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full | 2% of full range | |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|--|--------------------------------------|---------------------------------------|---|------------------------------|--|
| 13 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 15 | Manifold pressure | Full range | Each engine each second | As installed | 0.2% of full range | |
| 16 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | * Sufficient parameters e.g. EPR/N ₁ or torque/N _p as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided. |
| 17 | Engine gas generator speed (N _g) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 18 | Free power turbine speed (N _f) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 19 | Coolant temperature | Full range | 1 | As installed (±5°C recommended) | 1°C | |
| 20 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 21 | Cylinder head temperature | Full range | Each cylinder each second | As installed | 2% of full range | |
| 22 | Flaps position | Full range or each discrete position | 2 | As installed | 0.5° | |
| 23 | Primary flight control surface position | Full range | 0.25 | As installed | 0.2% of full range | |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|--------------------------------|--------------------------------------|---------------------------------------|----------------------------|------------------------------|--|
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | * Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

Table A2.3-3. Parameter characteristics for aircraft data recording systems

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|-------------------------------|--|---------------------------------------|---|------------------------------|---|
| 1 | Heading: | | | | | |
| 1 | a) Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | * Heading is preferred, if not available, yaw rate shall be recorded |
| | b) Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch: | | | | | |
| | a) Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | * Pitch attitude is preferred, if not available, pitch rate shall be recorded |
| | b) Pitch rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll: | | | | | |
| | a) Roll attitude | ±180° | 0.25 | ±2° | 0.5° | * If not available, roll rate shall be recorded |
| | b) Roll rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| | a) Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available |
| | b) Latitude/longitude | Latitude: ±90° Longitude: ±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| | c) Altitude | -300 m (-1 000 ft) to maximum certified altitude of aircraft + 1 500 m (5 000 ft) | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |
| | d) Ground speed | 0-1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|---------------------------|-------------------------|---------------------------------------|--|------------------------------|--|
| e) | Track | 0-360° | 2 (1 if available) | As installed (±2° recommended) | 0.5° | |
| f) | Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | -3 g to +6 g (*) | 0.25 (0.125 if available) | As installed (±0.09 g excluding a datum error of ±0.45 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding a | 0.004 g | |

| | | | | | |
|----|---|---|----------------------------|---|--|
| | | | | datum error of | |
| | | | | ±0.05 g | |
| | | | | recommended) | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended) | 0.1 mb (0.01 in-Hg) or 1.5 m (5 ft) |
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) |
| 11 | Engine RPM | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range |
| 12 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|-----|--|-------------------------|---------------------------------------|---|------------------------------|---|
| 13 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 15 | Manifold pressure | Full range | Each engine each second | As installed | 0.2% of full range | |
| 16 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | * Sufficient parameters e.g. EPR/N_1 or torque/ N_p as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided. |
| 17 | Engine gas generator speed (N_g) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 18 | Free power turbine speed (N_f) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 19 | Coolant temperature | Full range | 1 | As installed | 1°C | |

(±5°C
recommended)

| | | | | | |
|----|---|---|------------------------------|--------------|-----------------------|
| 20 | Main voltage | Full range | Each engine each second | As installed | 1 Volt |
| 21 | Cylinder head temperature | Full range | Each cylinder each second | As installed | 2% of full range |
| 22 | Flaps position | Full range or each discrete position | 2 | As installed | 0.5° |
| 23 | Primary flight control surface position | Full range | 0.25 | As installed | 0.2% of full range |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range |

| No. | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording reso- lution | Remarks |
|-----|-----------------------------------|---|--|----------------------------------|--------------------------------------|---|
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | * Where available, record up-and-locked and down-and- locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

SCHEDULE 7

Regulation 119

ARTICLE 83 bis AGREEMENT SUMMARY General Aviation Operations- Aeroplanes

Note.— A certified true copy of the agreement summary to be carried on board

1. Purpose and scope

The Article 83 bis agreement summary shall contain the information in the template in paragraph 2, in a standardized format.

| | | |
|---|--|---|
| Title of the Agreement: | | |
| State of Registry: | | Focal point: |
| State of the principal location of a general aviation operator: | | Focal point: |
| Date of signature: | By State of Registry ¹ : | |
| | By State of the principal location of a general aviation operator ¹ : | |
| Duration: | Start Date ¹ : | End Date (if applicable) ² : |
| Languages of the Agreement | | |
| ICAO Registration No.: | | |
| Umbrella Agreement (if any) with | | |

| | | | |
|---|---|-----|--|
| ICAO Registration number: | | | |
| Chicago Convention | ICAO Annexes affected by the transfer to the State of the principal location of a general aviation operator of responsibility in respect of certain functions and duties | | |
| Article 12: | Annex 2, all chapters | Yes | |
| Rules of the Air | | No | |
| Article 30 a): Aircraft | Radio Station Licence | Yes | |
| radio equipment | | No | |
| Articles 30 b) and 32 a): Personnel Licensing | Annex 1, Chapters 1, 2, 3 and 6 and Annex 6 Part I, Radio Operator or Part III, section II, Composition of the flight crew (radio operator) and/or Part II, Qualifications and/or Flight crew member licensing or Part III, Section III, Qualifications | Yes | Annex 6: [Specify Part and paragraph] ³ |
| | | No | |
| Article 31: | Annex 6 | Yes | [Specify Part and chapters] ³ |
| | Part I or Part III, Section II | No | |
| Certificates of | Annex 6 Part II or Part III, Section III | Yes | [Specify Part and chapters] ³ |
| Airworthiness | | No | |
| | Annex 8 | Yes | [Specify chapters] ³ |
| | Part II, Chapters 3 and 4 | No | |

**Aircraft affected by the transfer of responsibilities to the
State of the principal location of a general aviation operator**

| Aircraft make, model, series | Nationality and Registration marks | Serial No | AOC No. (Commercial air transport) | Dates of transfer of responsibilities | |
|------------------------------------|---|--------------|--|---------------------------------------|---------------------------------|
| | | | | From ¹ | To (if applicable) ² |
| | | | | | |

Notes.—

1. *dd/mm/yyyy.*
2. *dd/mm/yyyy or N/A if not applicable.*
3. *Square brackets indicate information that needs to be provided.*

SCHEDULE 8

Regulation 124(2)

ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE (GENERAL AVIATION — AEROPLANES)

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80 ft) in magnitude and shall have a standard deviation no greater than $28 - 0.013z^2$ for $0 \leq z \leq 25$ when z is the magnitude of the mean TVE in metres, or $92 - 0.004z^2$ for $0 \leq z \leq 80$ where z is in feet. In addition, the components of TVE shall have the following characteristics—

- (a) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude;
- (b) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft); and
- (c) the differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

2. In respect of aeroplanes for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aeroplanes encompassed by paragraph 1, the height-keeping performance capability shall be such that the components of the TVE of the aeroplane have the following characteristics:

- (a) the ASE of the aeroplane shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and
- (b) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

SCHEDULE 9

PART A

Regulation 152

ARTICLE 83 bis AGREEMENT SUMMARY (Commercial Air Transport - Helicopters)

Note.— A certified true copy of the agreement summary to be carried on board.

1. Purpose and scope

The Article 83 bis agreement summary shall contain the information in the template at paragraph 2 as applicable, in a standardized format.

2. Article 83 bis agreement summary for commercial air transport-helicopters

ARTICLE 83 bis AGREEMENT SUMMARY

| | | |
|----------------------------|---|---|
| Title of the Agreement: | | |
| | | |
| State of Registry: | | Focal point: |
| | | |
| State of the Operator: | | Focal point: |
| | | |
| Date of signature: | By State of Registry ¹ : | |
| | | |
| | By State of the Operator ¹ : | |
| Duration: | Start Date ¹ : | End Date (if applicable) ² : |
| | | |
| Languages of the Agreement | | |

| | | | |
|---|---|-----|--|
| | | | |
| ICAO Registration No.: | | | |
| | | | |
| Umbrella Agreement (if any) with | | | |
| ICAO Registration number: | | | |
| | | | |
| Chicago Convention | ICAO Annexes affected by the transfer of responsibility in respect of certain functions and duties to the State of the Operator | | |
| Article 12: Rules of the Air | Annex 2, all chapters | Yes | |
| | | No | |
| Article 30 a): Aircraft | Annex 2 (radio station licence) | Yes | |
| radio equipment | | No | |
| | | Yes | Annex 6: [Specify Part and paragraph] ³ |
| | | No | |
| Articles 30 b) and 32 a): Licenses of Personnel | Annex 1, Chapters 1, 2, 3 and 6; and Annex 6 Part III, section II, (composition of the flight crew (radio operator); and/or Annex 6, Part III, Section II, (qualifications) | | |

| | | | |
|---|---------------------------------|-----|---|
| Article 31: Certificates of Airworthiness | Annex 6 | Yes | [Specify Part and chapters] ³ |
| | Part III, Section II | No | |
| | Annex 6 Part III, Section II | Yes | [Specify Part and chapters] ³ |
| | | No | |
| | Annex 8 | Yes | [Specify chap- ters] ³ |
| Part II, Chapters 3 and 4 | No | | |

Aircraft affected by the transfer of responsibilities to the State of the Operator

| Aircraft make, model, series | Nationality and Registration marks | Serial No | AOC No. (Commercial air transport) | Dates of transfer of responsibilities | |
|---------------------------------------|---|--------------|--|--|---|
| | | | | From ¹ | To (if applica- ble) ² |
| | | | | | |
| | | | | | |

Notes.—

1. dd/mm/yyyy.

2. dd/mm/yyyy or N/A if not applicable.

3. Square brackets indicate information that needs to be provided.

PART B

Regulation 245(5)

ARTICLE 83 bis AGREEMENT SUMMARY
General Aviation- Helicopters

Note.— A certified true copy of the agreement summary to be carried on board.

1. Purpose and scope

The Article 83 bis agreement summary shall contain the information in the template at paragraph 3 as applicable, in a standardized format.

2. Article 83 bis agreement summary for general aviation-helicopters

ARTICLE 83 bis AGREEMENT SUMMARY

| | | |
|---|--|---|
| Title of the Agreement: | | |
| State of Registry: | | Focal point: |
| State of the Principal location of general aviation Operator: | | Focal point: |
| Date of signature: | By State of Registry ¹ : | |
| | By State of the principal location of a general aviation operator ¹ : | |
| Duration: | Start Date ¹ : | End Date (if applicable) ² : |
| Languages of the Agreement | | |
| ICAO Registration No.: | | |

| | | | |
|---|---|-----|--|
| | | | |
| Umbrella Agreement (if any) with | | | |
| ICAO Registration number: | | | |
| | | | |
| Chicago Convention | ICAO Annexes affected by the transfer of responsibility in respect of certain functions and duties to the State of the principal location of a general aviation Operator | | |
| Article 12: | Annex 2, all chapters | Yes | |
| Rules of the Air | | No | |
| Article 30 a): Aircraft radio equipment | Annex 2 (radio station licence) | Yes | |
| | | No | |
| Articles 30 b) and 32 a): Licenses of Personnel | Annex 1, Chapters 1, 2, 3 and 6; and Annex 6 Part III, section III, (composition of the flight crew (radio operator); and/or Annex 6, Part III, Section III, (qualifications)) | Yes | Annex 6: [Specify Part and paragraph] ³ |
| | | No | |
| | | | |
| | | | |
| Article 31: | Annex 6 | Yes | [Specify Part and chapters] ³ |
| | Part III, Section III | No | |

| | | | |
|-------------------------------|----------------------------------|-----|--|
| Certificates of Airworthiness | Annex 6 Part III, Section III | Yes | [Specify Part and chapters] ³ |
| | | No | |
| | Annex 8 | Yes | [Specify chapters] ³ |
| | | No | |
| | Part II, Chapters 3 and 4 | Yes | |
| | | No | |

Aircraft affected by the transfer of responsibilities to the State of principal location of a general aviation operator

| Aircraft make, model, series | Nationality and Registration marks | Serial No | AOC No. (Commercial air transport) | Dates of transfer of responsibilities | |
|------------------------------|------------------------------------|-----------|------------------------------------|---------------------------------------|---------------------------------|
| | | | | From ¹ | To (if applicable) ² |
| | | | | | |
| | | | mn | | |

- Notes.—
1. dd/mm/yyyy.
 2. dd/mm/yyyy or N/A if not applicable.
 3. Square brackets indicate information that needs to be provided.

- Notes.—
1. dd/mm/yyyy.
 2. dd/mm/yyyy or N/A if not applicable.
 3. Square brackets indicate information that needs to be provided.

SCHEDULE 10

Regulations 162, 163, 164, 170, 223, 224, 225 and 231

FLIGHT RECORDERS- HELICOPTER OPERATIONS)

The material in this Schedule concerns flight recorders intended for installation in helicopters engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following—

- (a) a flight data recorder (FDR);
- (b) a cockpit voice recorder (CVR);
- (c) an airborne image recorder (AIR);
- (d) a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following-

- (a) an aircraft data recording system (ADRS);
- (b) a cockpit audio recording system (CARS);
- (c) an airborne image recording system (AIRS);
- (d) a data link recording system (DLRS).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CARS or the ADRS.

1. GENERAL REQUIREMENTS

- (1) Non-deployable flight recorder containers shall be painted a distinctive orange colour.
- (2) Non-deployable crash-protected flight recorder containers shall—
 - (a) carry reflective material to facilitate their location; and
 - (b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practical date, but not later than 1st January 2018, this device shall operate for a minimum of 90 days.

- (3) Automatic deployable flight recorder containers shall—
 - (a) be painted a distinctive orange colour, however the surface visible from outside the helicopter may be of another colour;
 - (b) carry reflective material to facilitate their location; and
 - (c) have an integrated automatically activated ELT.
- (4) The flight recorder systems shall be installed so that—
 - (a) the probability of damage to the recordings is minimized;
 - (b) there is an aural or visual means for preflight checking that the flight recorder systems are operating properly; and
 - (c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and
 - (d) helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note.— The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.

- (5) The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads.
- (6) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.
- (7) The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

- (8) Means shall be provided for an accurate time correlation between the flight recorder systems functions.
- (9) The manufacturer usually provides the appropriate certificating authority with the following information in respect of the flight recorder systems—
 - (a) manufacturer's operating instructions, equipment limitations and installation procedures;
 - (b) parameter origin or source and equations which relate counts to units of measurement; and
 - (c) manufacturer's test reports.

2. *FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEM (ADRS)*

2.1 START AND STOP LOGIC

The FDR or ADRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power.

2.2 PARAMETERS TO BE RECORDED

- (1) The parameters that satisfy the requirements for FDRs, are listed in Table A4-1. The number of parameters to be recorded shall depend on helicopter complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of helicopter complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by helicopter systems or the flight crew to operate the helicopter. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.
- (2) The following parameters shall satisfy the requirements for flight path and speed—
 - (a) pressure altitude;
 - (b) indicated airspeed;
 - (c) outside air temperature;
 - (d) heading;

- (e) normal acceleration;
 - (f) lateral acceleration;
 - (g) longitudinal acceleration (body axis);
 - (h) time or relative time count;
 - (i) navigation data*: drift angle, wind speed, wind direction, latitude/longitude;
 - (j) radio altitude*.
- (3) Where further FDR recording capacity is available, recording of the following additional information shall be considered—
- (a) additional operational information from electronic displays, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS); and
 - (b) additional engine parameters (EPR, N_1 , fuel flow, etc.).
- (4) The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table A4-3.
- (5) Where further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A4-3 shall be considered.

2.3 ADDITIONAL INFORMATION

- (1) The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the authority.
- (2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3. *COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)*

3.1 START AND STOP LOGIC

The CVR or CARS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 SIGNALS TO BE RECORDED

- (1) The CVR shall record simultaneously on four separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the aircraft by radio;
 - (b) aural environment on the flight deck;
 - (c) voice communication of flight crew members on the flight deck using the interphone system, if installed;
 - (d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and
 - (e) voice communication of flight crew members using the passenger address system, if installed.
- (2) The CVR audio allocation should be as follows—
 - (a) pilot-in-command audio panel;
 - (b) co-pilot audio panel;
 - (c) additional flight crew positions and time reference; and
 - (d) cockpit area microphone.
- (3) The CARS shall record simultaneously on two separate channels, or more, at least the following—
 - (a) voice communication transmitted from or received in the helicopter by radio;
 - (b) aural environment on the flight deck; and

- (c) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed.
- (4) The CARS audio allocation should be as follows—
 - (a) voice communication; and
 - (b) aural environment on the flight deck.

4. AIRBORNE IMAGE RECORDER (AIR) AND AIRBORNE IMAGE RECORDING SYSTEM (AIRS)

4.1 START AND STOP LOGIC

The AIR or AIRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

4.2 CLASSES

- (1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1.— To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2.— There are no provisions for Class A AIRs or AIRS in these regulations.

- (2) A Class B AIR or AIRS captures data link message displays.
- (3) A Class C AIR or AIRS captures instruments and control panels.

Note.— A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR, or where an FDR is not required.

5. DATA LINK RECORDER (DLR)

5.1 APPLICATIONS TO BE RECORDED

- (1) Where the helicopter flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the helicopter) and downlinks (from the helicopter), shall be recorded on the helicopter. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall to be recorded.

Note.— Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.

- (2) Messages applying to the applications listed in Table A4-2 shall be recorded. Applications without the asterisk (*) are mandatory applications, which shall be recorded regardless of the system complexity. Applications with an (*) are to be recorded only as far as is practicable given the architecture of the system.

6. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

- (1) Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.
- (2) FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.
- (3) Recording inspections shall be carried out as follows—

- (a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
 - (b) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;
 - (c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
 - (d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;
 - (e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and
 - (f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.
 - (g) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.
- (4) A flight recorder system shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

- (5) A report of the recording inspection shall be made available on request to the authority for monitoring purposes.
- (6) Calibration of the FDR system—
 - (a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and
 - (b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

TABLE A4-1. PARAMETER CHARACTERISTICS FOR FLIGHT DATA RECORDERS

| Serial number | Parameter sampling and recording | Applicability | Measurement range | Maximum interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|--|--|-------------------------------|---|----------------------------|---|---|
| Serial number | | | | | | |
| 1 Time (UTC 24 hours $4 \pm 0.125\%$ /h 1 s when available, otherwise relative time count or GNSS time sync) | | | | | | |
| 2 | Pressure altitude m (5 ft) maximum certificated | | -300 m (-1 000 ft) to 1 | 1 | ± 30 m to ± 200 m | 1.5 (± 100 ft to ± 700 ft) altitude of aircraft +1 500 m (+5 000 ft) |
| 3 | Indicated airspeed measuring system | | As the installed pilot | 1 | $\pm 3\%$ | 1 kt display |
| 4 | Heading | 360° | 1 | $\pm 2^\circ$ | 0.5° | |
| 5 | Normal acceleration 0.004 g datum error of ± 0.045 g | | -3 g to +6 g | | 0.125 | ± 0.09 g excluding a |
| 6 | Pitch attitude range whichever is greater | | $\pm 75^\circ$ or 100% of | 0.5 | $\pm 2^\circ$ | 0.5° useable |
| 7 | Roll attitude | $\pm 180^\circ$ | 0.5 | $\pm 2^\circ$ | 0.5° | |
| 8 | Radio | On-off (one discrete) | 1 | — | — | transmission keying |
| 9 | Power on each range engine | | Full range 1 (per engine) | | $\pm 2\%$ | 0.1% of full |
| 10 | Main rotor: Main rotor speed | 50–130 | 0.51 | $\pm 2\%$ | 0.3% of full range | |
| | Rotor brake | Discrete | — | | | |
| 11 | Pilot input and/or position (0.25 accuracy uniquely recommended) | Full range | 0.5 $\pm 2\%$ unless higher 0.5% of operating range control surface required — primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) | | | |
| 12 | Hydraulics, each | Discrete 1 | — | — | — | system (low pressure and selection) |
| 13 | Outside air | Sensor range | | 2 | $\pm 2^\circ\text{C}$ | 0.3°C temperature |
| 14* | Autopilot/ autothrottle/AFCS mode and engagement status | A suitable combination of | discretes | 1 | — | — |
| 15* | Stability augmentation system engagement | Discrete | | 1 | — | — |
| 16* | Main gearbox oil pressure | As installed | | 1 | As installed | 6.895 kN/m ² (1 psi) |
| 17* | Main gearbox oil temperature | As installed | | 2 | As installed | 1°C |
| 18 | Yaw rate | $\pm 400^\circ/\text{second}$ | | | 0.25 $\pm 1.5\%$ maximum range excluding datum error of $\pm 5\%$ | |

| | | | | | |
|-----|---|--|------|---|---|
| 19* | Sling load force | 0 to 200% of certified load | 0.5 | $\pm 3\%$ of maximum range | 0.5% for maximum certified load |
| 20 | Longitudinal acceleration | ± 1 g | 0.25 | ± 0.015 g | 0.004 g |
| 21 | Lateral acceleration | ± 1 g | 0.25 | ± 0.015 g | 0.004 g |
| 22* | Radio altitude | -6 m to 750 m (-20 ft to 2 500 ft) | 1 | ± 0.05 g ± 0.6 m (± 2 ft) or $\pm 3\%$ whichever is greater below 150 m (500 ft) and $\pm 5\%$ above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 23* | Vertical beam deviation | Signal range | 1 | $\pm 3\%$ | 0.3% of full range |
| 24* | Horizontal beam deviation | Signal range | 1 | $\pm 3\%$ | 0.3% of full range |
| 25 | Marker beacon passage | Discrete | 1 | — | — |
| 26 | Warnings | Discrete(s) | 1 | — | — |
| 27 | Each navigation receiver frequency selection | Sufficient to determine selected frequency | 4 | As installed | — |
| 28* | DME 1 and 2 distances | 0–370 km (0–200 NM) | 4 | As installed | 1 852 m (1 NM) |
| 29* | Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction) | As installed | 2 | As installed | As installed |
| 30* | Landing gear and gear selector position | Discrete | 4 | — | — |
| 31* | Engine exhaust gas temperature (T_4) | As installed | 1 | As installed | |
| 32* | Turbine inlet temperature (TIT/ITT) | As installed | 1 | As installed | |

| | | | | | |
|-----|---|--------------|-----------------------|--------------|--|
| 33* | Fuel contents | As installed | 4 | As installed | |
| 34* | Altitude rate | As installed | 1 | As installed | |
| 35* | Ice detection | As installed | 4 | As installed | |
| 36* | Helicopter health and usage monitor system | As installed | — | As installed | — |
| 37 | Engine control modes | Discrete | 1 | — | — |
| 38* | Selected barometric setting (pilot and co-pilot) | As installed | 64 (4 recommended) | As installed | 0.1 mb (0.01 in Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42 | Selected vertical speed (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43 | Selected heading (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 44 | Selected flight path (all pilot selectable modes of operation) | As installed | 1 | As installed | Sufficient to determine crew selection |
| 45 | Selected decision height | As installed | 4 | As installed | Sufficient to determine crew selection |
| 46 | EFIS display format (pilot and co-pilot) | Discrete(s) | 4 | — | — |

| | | | | | |
|-----|---|-------------|--|-------------------------|---|
| 47* | Multi- function/ engine/ alerts display format | Discrete(s) | 4 | — | — |
| 48* | Event marker | Discrete | 1 | — | — |
| 49* | GPWS/TAWS/GCAS Application for status (selection of type terrain display mode certification is including pop-up submitted to a display status) and Contracting (terrain alerts, both State on or cautions and warnings, after 1 January and advisories) and 2023 (on/off switch position and (operational status) | Discrete(s) | 1 | As installed | |
| 50* | TCAS/ACAS (traffic Application for alert and collision type avoidance system) and certification is (operational status) submitted to a Contracting State on or after 1 January 2023 | Discrete(s) | 1 | As installed | |
| 51* | Primary flight controls Application for – pilot input forces type certification is submitted to a Contracting State on or after 1 January 2023 | Full range | 0.125 ± 3% unless higher (0.0625 accuracy is uniquely recommended) | 0.5% of operating range | |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|----------------------------|---|-------------------|---|--|----------------------|
| 52* | Computed centre of gravity | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 53* | Helicopter computed weight | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |

Table A4-1. Parameter Characteristics for Flight Data Recorders

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and | Accuracy limits (senso input compared to FDR readout) | Recording resolution |
|---------------|--|---------------|--|------------------------|---|-------------------------|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125% /h | 1 s |
| 2 | Pressure altitude | | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed | | As the installed pilot display measuring system | 1 | ±3% | 1 kt |
| 4 | Heading | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration | | -3 g to +6 g | 0.125 | ±0.09 g excluding a datum error of ±0.045 g | 0.004 g |
| 6 | Pitch attitude | | ±75° or 100% of useable range whichever is greater | 0.5 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.5 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | — | — |
| 9 | Power on each engine | | Full range | 1 (per engine) | ±2% | 0.1% of full range |
| 10 | Main rotor: | | | | | |
| | Main rotor speed | | 50-130% | 0.51 | ±2% | 0.3% of full range |
| | Rotor brake | | Discrete | | — | — |
| 11 | Pilot input and/or control surface position — primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) | | Full range | 0.5 (0.25 recommended) | ±2% unless higher accuracy uniquely required | 0.5% of operating range |
| 12 | Hydraulics, each system (low pressure and selection) | | Discrete | 1 | — | — |
| 13 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|--|---|--|---|
| 14* | Autopilot/ autothrottle/AFCS mode and engagement status | | A suitable combination of discretets | 1 | — | — |
| 15* | Stability augmentation system engagement | | Discrete | 1 | — | — |
| 16* | Main gearbox oil pressure | | As installed | 1 | As installed | 6.895 kN/m ² (1 psi) |
| 17* | Main gearbox oil temperature | | As installed | 2 | As installed | 1°C |
| 18 | Yaw rate | | ±400°/second | 0.25 | ±1.5% maximum range excluding datum error of ±5% | ±2°/s |
| 19* | Sling load force | | 0 to 200% of certified Load | 0.5 | ±3% of maximum range | 0.5% for maximum certified load |
| 20 | Longitudinal acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 21 | Lateral acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 22* | Radio altitude | | -6 m to 750 m (-20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 23* | Vertical beam deviation | | Signal range | 1 | ±3% | 0.3% of full range |
| 24* | Horizontal beam deviation | | Signal range | 1 | ±3% | 0.3% of full range |
| 25 | Marker beacon passage | | Discrete | 1 | — | — |
| 26 | Warnings | | Discrete(s) | 1 | — | — |
| 27 | Each navigation receiver frequency selection | | Sufficient to determine selected frequency | 4 | As installed | — |
| 28* | DME 1 and 2 distances | | 0-370 km (0-200 NM) | 4 | As installed | 1 852 m (1 NM) |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|---|---------------|-------------------|---|--|--|
| 29* | Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction) | | As installed | 2 | As installed | As installed |
| 30* | Landing gear and gear selector position | | Discrete | 4 | — | — |
| 31* | Engine exhaust gas temperature (T _e) | | As installed | 1 | As installed | |
| 32* | Turbine inlet temperature (TIT/ITT) | | As installed | 1 | As installed | |
| 33* | Fuel contents | | As installed | 4 | As installed | |
| 34* | Altitude rate | | As installed | 1 | As installed | |
| 35* | Ice detection | | As installed | 4 | As installed | |
| 36* | Helicopter health and usage monitor system | | As installed | — | As installed | — |
| 37 | Engine control modes | | Discrete | 1 | — | — |
| 38* | Selected barometric setting (pilot and co-pilot) | | As installed | 64 (4 recommended) | As installed | 0.1 mb (0.01 in Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |

| Serial number | Parameter | Applicability | Measurement range | Maximum sampling and recording interval (seconds) | Accuracy limits (sensor input compared to FDR readout) | Recording resolution |
|---------------|--|---|-------------------|---|--|--|
| 44* | Selected flight path (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 45* | Selected decision height | | As installed | 4 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot and co-pilot) | | Discrete(s) | 4 | — | — |
| 47* | Multi-function/engine/alerts display format | | Discrete(s) | 4 | — | — |
| 48* | Event marker | | Discrete | 1 | — | — |
| 49* | GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) and (operational status) | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s) | 1 | As installed | |
| 50* | TCAS/ACAS (traffic alert and collision avoidance system) and (operational status) | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s) | 1 | As installed | |
| 51* | Primary flight controls – pilot input forces | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Full range | 0.125 (0.0625 recommended) | ± 3% unless higher accuracy is uniquely required | 0.5% of operating range |
| 52* | Computed centre of gravity | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 53* | Helicopter computed weight | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |

Table A4-2. Description of Applications for Data Link Recorders

| Item No. | Application type | Application description | Recording content |
|----------|---------------------------------------|--|-------------------|
| 1 | Data link initiation | This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively. | C |
| 2 | Controller/pilot communication | This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances. | C |
| 3 | Addressed surveillance | This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | C |
| 4 | Flight information | This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services. | C |
| 5 | Aircraft broadcast surveillance | This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the helicopter are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | M* |
| 6 | Aeronautical operational control data | This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control). | M* |

Key:

C: Complete contents recorded.

M: Information that enables correlation to any associated records stored separately from the helicopter.

*: Applications that are to be recorded only as far as is practicable given the architecture of the system.

TABLE A4-3. PARAMETER CHARACTERISTICS FOR AIRCRAFT DATA RECORDING SYSTEMS

| N° | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|----|-------------------------------|---|---------------------------------------|--|------------------------------|--|
| 1 | Heading: | | | | | |
| | a) Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | *Heading is preferred, if not available, yaw rate shall be recorded |
| | b) Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch: | | | | | |
| | a) Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | *Pitch attitude is preferred, if not available, pitch rate shall be recorded |
| | b) Pitch rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll: | | | | | |
| | a) Roll attitude | ±180° | 0.25 | ±2° | 0.5° | *Roll attitude is preferred, if not available, roll rate shall be recorded |
| | b) Roll rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| | a) Time | 24 hours | 1 | ±0.5° | 0.1° | UTC time preferred where available |
| | b) Latitude/longitude | Latitude:±90° Longitude:±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| | c) Altitude | -300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft) | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |
| | d) Ground speed | 0-1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |
| | e) Track | 0-360° | 2 (1 if available) | As installed (± 2° recommended) | 0.5° | |
| | f) Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |

| No | Parameter Name | Minimum Recording Range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording Resolution | Remarks |
|----|---|---|---------------------------------------|---|--|--|
| 5 | Normal acceleration | -3 g to + 6 g | 0.25 (0.125 if available) | As installed (±0.09 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 hPa (1.02 in-Hg) to 310.2 hPa (9.16 in-Hg) or available sensor range | 1 | As installed (±1 hPa (0.3 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 | 0.1 hPa (0.03 in-Hg) or 1.5 m (5 ft) | |
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Main rotor speed (Nr) | 50% to 130% or available sensor range | 0.5 | As installed | 0.3% of full range | |
| 12 | Engine RPM (*) | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | *For piston- engined helicopters |
| 13 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Engine oil temperature | Full range | Each engine each second | As Installed (5% of full range recommended) | 2% of full range | |
| 15 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 16 | Manifold pressure (*) | Full range | Each engine each | As installed | 0.2% of full | *For piston- |

| N° | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|----|--|--------------------------------------|---------------------------------------|---------------------------------|------------------------------|---|
| 17 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | *Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine-engined helicopters. |
| 18 | Engine gas generator speed (Ng) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 19 | Free power turbine speed (Nf) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 20 | Collective pitch | Full range | 0.5 | As installed | 0.1% of full range | |
| 21 | Coolant temperature (*) | Full range | 1 | As installed (±5°C recommended) | 1° C | *Only for piston-engined helicopters |
| 22 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 23 | Cylinder head temperature (*) | Full range | Each cylinder each second | As installed | 2% of full range | *Only for piston-engined helicopters |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | *Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

Table A4-3. Parameter Characteristics for Aircraft Data Recording Systems

| N° | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|----|-------------------------------|--|---------------------------------------|--|------------------------------|--|
| 1 | Heading: | | | | | |
| | a) Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | *Heading is preferred, if not available, yaw rate shall be recorded |
| | b) Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 | Pitch: | | | | | |
| | a) Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | *Pitch attitude is preferred, if not available, pitch rate shall be recorded |
| | b) Pitch rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 | Roll: | | | | | |
| | a) Roll attitude | ±180° | 0.25 | ±2° | 0.5° | * Roll attitude is preferred, if not available, roll rate shall be recorded |
| | b) Roll rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 | Positioning system: | | | | | |
| | a) Time | 24 hours | 1 | ±0.5° | 0.1° | UTC time preferred where available |
| | b) Latitude/longitude | Latitude:±90° Longitude:±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| | c) Altitude | -300 m (-1000 ft) to maximum certificated altitude | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |

| | | | | | | |
|--------------------|-----------------|---|---------------------------------------|--|-------------------|--|
| | | | of aircraft +1 500 m (5 000 ft) | | | |
| d) Ground speed | 0–1 000 kt | 2 | (1 if available) | As installed (±5 kt recommen- ed) | 1 kt | |
| e) Track | 0–360° | 2 | (1 if available) | As installed (± 2° recommen- ed) | 0.5° | |
| f) Estimated error | Available range | 2 | (1 if available) | As installed | As in- stalled | Shall be recorded if readily available |

| N° | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|----|---|--|---------------------------------------|--|---|---------|
| 5 | Normal acceleration | -3 g to + 6 g | 0.25 (0.125 if available) | As installed (±0.09 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 hPa (1.02 in-Hg) to 310.2 hPa (9.16 in-Hg) or available sensor range | 1 | As installed (±1 hPa (0.3 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) | 0.1 hPa (0.03 in-Hg) or 1.5 m (5 ft) | |

| | | | | | | |
|----|--|---|-------------------------|---|---------------------------|---------------------------------|
| | | | | recommended) | | |
| 9 | Outside air temperature (or total air temperature) | -50° to +90°C or available sensor range | 2 | As installed (±2°C | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Main rotor speed (Nr) | 50% to 130% or available sensor range | 0.5 | As installed | 0.3% of full range | |
| 12 | Engine RPM (*) | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | *For piston-engined helicopters |
| 13 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 15 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 16 | Manifold pressure (*) | Full range | Each engine each second | As installed | 0.2% of full range | *For piston-engined helicopters |

| N° | Parameter name | Minimum recording range | Maximum recording interval in seconds | Minimum recording accuracy | Minimum recording resolution | Remarks |
|----|--|-------------------------|---------------------------------------|----------------------------|------------------------------|---|
| 17 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | *Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine |

| | | | | | | |
|----|-------------------------------------|--|-----------------------------|------------------------------------|--------------------|---|
| | | | | | | shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine-engined helicopters. |
| 18 | Engine gas generator speed (Ng) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 19 | Free power turbine speed (Nf) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 20 | Collective pitch | Full range | 0.5 | As installed | 0.1% of full range | |
| 21 | Coolant temperature (*) | Full range | 1 | As installed (±5°C recommended) | 1° C | *Only for piston-engined helicopters |
| 22 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 23 | Cylinder head temperature (*) | Full range | Each cylinder each second | As installed | 2% of full range | *Only for piston-engined helicopters |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or 1 each discrete position | | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | | *Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

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| 49,87,177,178,179,214,215,216 | VFR operations. | A |
| 55,93,136,177,180,214,217 | IFR Operations | A |
| 6 | Standby attitude indicator. | A |
| 78,123 | Navigation equipment for operations in minimal navigation performance specification airspace (MNPS) | B |
| 79,124 | Equipment for operations in reduced vertical separation minimum airspace (RVSM). | B |
| 75,79,120, 125, 144,199,246 | Radio equipment | A |
| 66,141, | Airborne collision avoidance system. | A |
| 67,99,142,192,239 | Altitude Reporting transponder. | A |
| 8,14,24 | Aircraft lights and instrument illumination. | A |
| 9 | Engine instruments. | A |
| 24,61,96 | Machmeter and speed warning devices. | B |
| 10 | Landing gear: aural warning device. | B |
| 62,97,181 | Ground proximity warning system. | A |
| 58,189 | Weather radar. | A |
| 37,38,39, 40,106,107,108,167,168,169,228,229,230 | Cockpit voice recorders: aircraft. | A |
| 34,35,36,103,104,105,163,164,165,166,224,225,226,227 | Flight data recorders. | A |
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| 28,46 | Exits. | A |
| 52,91,185,220 | Flights over designated land areas: all aircraft. | A |

| | | |
|-----------------------|---|---|
| 11,17 | Survival equipment. | A |
| 26,155,208 | Portable fire extinguishers. | A |
| 30,159,212 | Lavatory fire extinguisher. | A |
| 53 | Smoke detector | A |
| 13 | Crash axe. | A |
| 32,86,161,213 | Marking of break-in points. | A |
| 207 | First-aid and emergency medical kit. | A |
| 53,92,129,134,187,221 | Oxygen equipment and supply requirements. | A |
| 63,64 | Megaphones: aircraft. | A |
| 88,89,90 | Individual flotation devices. | A |
| 66,183,219 | Life rafts. | A |
| 28 | Life jackets: helicopters. | A |
| 27,156,209 | Seats, safety belts and shoulder harnesses. | A |
| 28,157,209 | Passenger information signs. | A |
| | Power supply, distribution and indication system. | A |
| 29,158,211 | Protective circuit fuses. | A |
| 14,54,135,188 | Aircrafts in icing conditions. | A |
| 15 | Pitot indication systems. | A |
| 16 | Static pressure system. | A |
| 31,160,210 | Chart | A |
| 59,139 | Cosmic radiation detection equipment. | A |
| 50,88 | Seaplanes and amphibians – miscellaneous equipment. | A |
| 113,252 | Use and retention of records. | B |
| 253,255 | Reports of violation. | B |
| 254 | Enforcement of directions | A |

Cross References

Civil Aviation (Aeronautical Communication Systems) Regulations, 2022 S.I. No. 70 of 2022

Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022 S.I. No. 66 of 2022

Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 S.I. No. 73 of 2022

Civil Aviation (Air Traffic Services) Regulations, 2022 S.I. No. 74 of 2022

Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 S.I. No. 77 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport Aeroplanes) Regulations, 2022 S.I. No. 84 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport and General Aviation Helicopters) Regulations, 2022 S.I. No. 85 of 2022

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 S.I. No. 86 of 2022

Civil Aviation (Rules of the Air) Regulations, 2020 S.I. No. 15 of 2020

Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022 S.I. No. 93 of 2022

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GEN. EDWARD KATUMBA WAMALA
Minister of Works and Transport.

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 74.

**THE CIVIL AVIATION (AIR TRAFFIC SERVICES)
REGULATIONS, 2022**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 74.

The Civil Aviation (Air Traffic Services) Regulations, 2022

*(Under sections 34 (2) and 61 of the Civil Aviation Authority Act,
Cap 354)*

IN EXERCISE of the powers conferred upon the Minister by sections 34 (2) and 61 of the Civil Aviation Authority Act, and on the recommendation of the Civil Aviation Authority, these Regulations are made this 22nd day of December, 2021.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Air Traffic Services) Regulations, 2022.

2. Application

(1) These Regulations shall apply to a person providing air traffic services within designated air spaces and at aerodromes.

(2) These Regulations do not apply to a person providing air traffic services in the course of his or her duties to State aircraft.

3. Interpretation

In these Regulations unless the context otherwise requires—

“accepting unit” means air traffic control unit next to take control of an aircraft;

“accident” means an occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft,

takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which—

- (a) a person is fatally or seriously injured as a result of—
 - (i) being in the aircraft; or
 - (ii) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or
 - (iii) direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

- (b) the aircraft sustains damage or structural failure which—
 - (i) adversely affects the structural strength, performance or flight characteristics of the aircraft; and
 - (ii) would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, including its cowlings or accessories, to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin such as small dents or puncture holes, or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike including holes in the radome; or

- (c) the aircraft is missing or is completely inaccessible—
“advisory airspace” means an airspace of defined

- dimensions, or designated route, within which air traffic advisory service is available;
- “advisory route” means a designated route along which air traffic advisory service is available;
- “aerodrome” means a defined area on land or water including any buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;
- “aerodrome control service” means an air traffic control service for aerodrome traffic;
- “aerodrome control tower” means a unit established to provide air traffic control service to aerodrome traffic;
- “aerodrome traffic” means all traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome;
- “aeronautical fixed service (AFS)” means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services;
- “Aeronautical Information Publication (AIP)” means a publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation;
- “aeronautical mobile service” means a mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies;
- “aeronautical telecommunication station” means a station in the aeronautical telecommunication service;
- “Airborne Collision Avoidance System (ACAS)” means an aircraft system based on secondary surveillance radar

(SSR) transponder signals which operates independently of ground based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface;

“air-ground communication” means two-way communication between aircraft and stations or locations on the surface of the earth;

“Air Navigation Service Provider” means a directorate in the Authority designated for the purposes of operating and managing air navigation services;

“air-taxiing” means movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kts);

“air traffic” means all aircraft in flight or operating on the manoeuvring area of an aerodrome;

“air traffic advisory service” means a service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans;

“air traffic control clearance” means authorisation for an aircraft to proceed under conditions specified by an air traffic control unit;

“air traffic controller schedule” means a plan for allocating air traffic controller duty periods and non-duty periods over a period of time, otherwise referred to as a roster;

“air traffic control service” means a service provided for the purpose of—

- (a) preventing collisions—
 - (i) between aircraft; and
 - (ii) on the manoeuvring area between aircraft and obstructions; and

(b) expediting and maintaining an orderly flow of air traffic;

“air traffic control unit” includes area control center, approach control unit or aerodrome control tower;

“air traffic flow management (ATFM)” means a service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilised to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority;

“air traffic service (ATS)” includes flight information service, alerting service, air traffic advisory service, air traffic control service area control service, approach control service or aerodrome control service;

“air traffic services airspaces” means airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified;

“air traffic services reporting office” means a unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure;

“air traffic services unit” includes air traffic control unit, flight information center or air traffic services reporting office;

“airway” means a control area or portion of the area established in the form of a corridor;

“ALERFA” means the code word used to designate an alert phase;

“alerting service” means a service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required;

“alert phase” means a situation where apprehension exists as to the safety of an aircraft and its occupants;

“alternate aerodrome” means an aerodrome to which an aircraft may proceed when it is either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use; alternate aerodromes includes—

- (a) *take-off alternate means* an alternate aerodrome at which an aircraft is able to land should landing become necessary shortly after take-off and it is not possible to use the aerodrome of departure;
- (b) *en-route alternate means* an alternate aerodrome at which an aircraft is able to land in the event that a diversion becomes necessary while en route; and
- (c) *destination alternate means* an alternate aerodrome at which an aircraft is able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing;

“altitude” means the vertical distance of a level, a point or an object considered as a point, measured from the mean sea level;

“approach control service” means air traffic control service for arriving or departing controlled flights;

“approach control unit” means a unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes;

“air traffic services (ATS) authority” means the relevant authority designated by the State responsible for providing air traffic services in the airspace concerned;

“apron” means a defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance;

- “apron management service” means a service provided to regulate the activities and the movement of aircraft and vehicles on an apron;
- “area control center” means a unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction;
- “area control service” means air traffic control service for controlled flights in control areas;
- “area navigation (RNAV)” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground or space based navigation aids or within the limits of the capability of self-contained aids, or a combination of these;
- “area navigation route” means an ATS route established for the use of aircraft capable of employing area navigation;
- “ATS route” means a specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services;
- “authority” means the Uganda Civil Aviation Authority;
- “automatic dependent surveillance - broadcast (ADS-B)” means a way by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link;
- “automatic dependent surveillance - contract (ADS-C) agreement” means a reporting plan which establishes the conditions of ADS-C data reporting, that is, data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services;

“automatic dependent surveillance - contract (ADS-C)” means a way by which the terms of an ADS-C agreement are exchanged between the ground system and the aircraft, via a data link, specifying the conditions under which ADS-C reports would be initiated, and what data would be contained in the reports;

“automatic terminal information service (ATIS)” means the automatic provision of current, routine information to arriving and departing aircraft for 24 hours or a specified portion thereof including—

- (a) “data link-automatic terminal information service (D- ATIS)” which is the provision of ATIS via data link; and
- (b) “voice-automatic terminal information service (Voice- ATIS)” which is the provision of ATIS by means of continuous and repetitive voice broadcasts;

“base turn” means a turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track and the tracks are not reciprocal;

“calendar” means a discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day;

“change-over point” means the point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omni-directional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft;

“clearance limit” means the point to which an aircraft is granted an air traffic control clearance;

- “conference communications” means communication facilities where direct speech conversation may be conducted between three or more locations simultaneously;
- “control area” means a controlled airspace extending upwards from a specified limit above the earth;
- “controlled aerodrome” means an aerodrome at which air traffic control service is provided to aerodrome traffic;
- “controlled airspace” means an airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification;
- “controlled flight” means any flight which is subject to an air traffic control clearance;
- “Controller-Pilot Data Link Communications (CPDLC)” means a mode of communication between controller and pilot, using data link for ATC communications;
- “control zone” means a controlled airspace extending upwards from the surface of the earth to a specified upper limit;
- “cruising level” means a level maintained during a significant portion of a flight;
- “cyclic redundancy checks (CRC)” means a mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data;
- “danger area” means an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times;
- “data accuracy” means a degree of conformance between the estimated or measured value and the true value;

“data integrity or data assurance level” means a degree of assurance that an aeronautical data and its value has not been lost or altered since the origination or authorised amendment;

“data integrity classification” means classification based upon the potential risk resulting from the use of corrupted data classified as —

- (a) routine data where there is a very low probability that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- (b) essential data where there is a low probability that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- (c) critical data where there is a high probability that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

“data link communications” means a form of communication intended for the exchange of messages via a data link;

“data link-VOLMET (D-VOLMET)” means provision of current aerodrome routine meteorological reports and aerodrome special meteorological reports, aerodrome forecasts, SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link;

“data quality” means a degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution and integrity or equivalent assurance level, traceability, timeliness, completeness and format;

“datum” means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities;

- “declared capacity” means a measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities; it is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace;
- “DETRESFA” means the code word used to designate a distress phase;
- “distress phase” means a situation where there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance;
- “downstream clearance” means a clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft;
- “duty” means any task that an air traffic controller is required by the air traffic services provider to perform including tasks performed during time-in-position, administrative work and training;
- “duty period” means a period which starts when an air traffic controller is required by an air traffic services provider to report for or commence a duty and ends when he or she is free from all duties;
- “emergency phase” means an uncertainty phase, alert phase or distress phase;
- “fatigue” means a physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, or workload both mental or physical activity, that can impair a person’s alertness and ability to perform safety-related operational duties;

“final approach” means that part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified—

- (a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- (b) at the point of interception of the last track specified in the approach procedure, and ends at a point in the vicinity of an aerodrome from which—
 - (i) a landing can be made; or
 - (ii) a missed approach procedure is initiated;

“flight crew member” means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period;

“flight information center” means a unit established to provide flight information service and alerting service;

“flight information region” means an airspace of defined dimensions within which flight information service and alerting service are provided;

“flight information service” means a service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights;

“flight level” means a surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals;

“flight plan” means a specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft;

“forecast” means a statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace;

- “geodetic datum” means a minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system or frame;
- “Gregorian calendar” means the calendar in general use, first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar;
- “height” means the vertical distance of a level, a point or an object considered as a point, measured from a specified datum;
- “human factor principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;
- “human performance” means a human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;
- “INCERFA” means the code word used to designate an uncertainty phase;
- “incident” means an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation; “IFR” means the instrument flight rules;
- “IFR flight” means a flight conducted in accordance with the instrument flight rules;
- “instrument flight procedure design service” means a service established for the design, documentation, validation, maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation;

- “instrument meteorological conditions (IMC)” means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions;
- “international NOTAM office” means an office designated by the authority for the exchange of NOTAM internationally;
- “level” means the vertical position of an aircraft in flight and includes, height, altitude or flight level;
- “maneuvering area” means that part of an aerodrome used for the take-off, landing and taxiing of aircraft, excluding aprons;
- “meteorological watch office” means an office designated by the meteorological service provider to provide information concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations within its specified area of responsibility;
- “meteorological service provider” means a person or entity designated under the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022, to provide or arrange for provision of meteorological services for air navigation on behalf of Uganda;
- “movement area” means that part of an aerodrome used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the aprons;
- “navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace and there are two kinds of navigation specifications —
- (a) “required navigation performance (RNP) specification” means a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, for example RNP 4, RNP APCH;

- (b) “area navigation (RNAV) specification” means a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, for example RNAV 5, RNAV 1;

“non-duty period” means a continuous and defined period of time, subsequent to or prior to duty periods, during which the air traffic controller is free of all duties;

“NOTAM” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations;

“obstacle” means all fixed, whether temporary or permanent and mobile objects, or parts that—

- (a) are located on an area intended for the surface movement of aircraft;
- (b) extend above a defined surface intended to protect aircraft in flight; or
- (c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation;

“operator” means a person, organisation or enterprise engaged in or offering to engage in an aircraft operation;

“Performance-Based Navigation (PBN)” means area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace;

“Performance-Based Communication (PBC)” means communication based on performance specifications applied to the provision of air traffic services;

- “Performance-Based Surveillance (PBS)” means surveillance based on performance specifications applied to the provision of air traffic services;
- “Pilot-In-Command (PIC)” means the pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight;
- “printed communications” means communications which automatically provide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit;
- “prohibited area” means airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited;
- “QNH” means the barometric pressure at a given location corrected to the mean sea level in the international standard atmosphere conditions;
- “radio navigation service” means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids;
- “radiotelephony” means a form of radio communication primarily intended for the exchange of information in the form of speech;
- “reporting point” means a specified geographical location in relation to which the position of an aircraft can be reported;
- “required communication performance (RCP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability and operations needed to support performance-based communication;

- “Required Communication Performance (RCP)” means a statement of the performance requirements for operational communication in support of specific ATM functions;
- “Required Surveillance Performance (RSP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability and operations needed to support performance-based surveillance;
- “rescue coordination center” means a unit responsible for promoting efficient organisation of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region;
- “restricted area” means an airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance to certain specified conditions;
- “runway” means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft;
- “Runway Visual Range (RVR)” means the range over which the pilot of an aircraft on the center line of a runway can see the runway surface markings or the lights delineating the runway or identifying its center line;
- “Safety Management System (SMS)” means a systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures;
- “SIGMET information” means information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations;

- “significant point” means a specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes;
- “special VFR flight” means a VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC or at night;
- “station declination” means an alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated;
- “strayed aircraft” means an aircraft which has deviated significantly from its intended track or which reports that it is lost;
- “taxiing” means movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing;
- “terminal control area” means a control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes;
- “time-in-position” means the period of time when an air traffic controller is exercising the privileges of the air traffic controller’s licence at an operational position;
- “track” means the projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid);
- “traffic avoidance advice” means advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision;
- “traffic information” means information issued by an air traffic services unit to alert a pilot to other known or observed air

traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision;

“transfer of control point” means a defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next;

“transferring unit” means air traffic control unit in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit along the route of flight;

“uncertainty phase” means a situation where uncertainty exists as to the safety of an aircraft and its occupants;

“unidentified aircraft” means an aircraft which has been observed or reported to be operating in a given area but whose identity has not been established;

“visual flight rules (VFR) flight” means a flight conducted in accordance with the visual flight rules;

“visual meteorological conditions (VMC)” means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima;

“VOLMET” means meteorological information for aircraft in flight;

“Volcanic Ash Advisory Center (VAAC)” means a meteorological center designated by the Africa Indian Ocean regional air navigation agreement to provide advisory information to Meteorological Watch Offices, area control centers, flight information centers, world

area forecast centers and international operational meteorological information databanks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions;

“waypoint” means a specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation and waypoints are identified as either—

- (a) “fly-by waypoint” which is a waypoint that requires turn anticipation to allow tangential interception of the next segment of a route or procedure;
- (b) “flyover waypoint” which is a waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

PART II—GENERAL

4. Air Navigation Services Provider certificate

A person who wishes to provide air traffic services shall obtain an Air Navigation Services Provider certificate in accordance with the Civil Aviation (Certification of Air Navigation Services) Regulations, 2022.

5. Establishment of ATS provider

(1) The authority shall determine portions of the airspace and aerodromes where air traffic services shall be provided including territories over which the authority has jurisdiction.

(2) Air traffic services shall be provided in accordance with these Regulations, except that, by mutual agreement, the authority

may delegate to another State the responsibility for establishing and providing air traffic services in flight information regions, control areas or control zones extending over the territory of Uganda.

(3) Information shall, where air traffic services are established, be published in the Aeronautical Information Publication to permit the utilisation of the services.

6. Objectives of air traffic services

The objectives of the ATS are—

- (a) to prevent collision between aircrafts;
- (b) to prevent collision between aircraft on the manoeuvring area and obstructions on that area;
- (c) to expedite and maintain an orderly flow of air traffic;
- (d) to provide advice and information for the safe and efficient conduct of flights; and
- (e) to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.

7. Composition of air traffic services

For the purposes of these Regulations, air traffic services shall comprise—

- (a) the air traffic control service to accomplish objectives (a), (b) and (c) of regulation (6), and the service shall be divided into three parts including—
 - (i) area control service: the provision of air traffic control service for controlled flights, except for those parts of such flights described in paragraph (b) and (c) of this regulation, in order to accomplish objectives (a) and (c) of regulation (6)

- (ii) approach control service: the provision of air traffic control service for those parts of controlled flights associated with arrival or departure, in order to accomplish objectives (a) and (c) of regulation (6); and
 - (iii) aerodrome control service: the provision of air traffic control service for aerodrome traffic, except for those parts of flights described in paragraph (b), in order to accomplish objectives paragraphs (a), (b) and (c) of regulation (6);
- (b) the flight information service, to accomplish objective (d) of regulation (6); and
 - (c) the alerting service, to accomplish objective (e) of regulation (6).

8. Determination of need for air traffic services

(1) The provision of air traffic services shall be determined by—

- (a) the types of air traffic involved;
- (b) the density of air traffic;
- (c) the meteorological conditions; and
- (d) such other factors as may be relevant to air traffic.

(2) For the avoidance of doubt, the carriage of an ACAS by aircraft in a given area shall not be a factor in determining the need for air traffic services in the area.

9. Designation of portions of airspace and controlled aerodromes where air traffic services will be provided

(1) Where the authority has determined that air traffic services shall be provided in particular portions of the airspace or at particular aerodromes, the authority shall designate those portions of the airspace or aerodromes in relation to the air traffic services that shall be provided.

(2) The designation of the particular portions of the airspace or aerodromes shall include—

- (a) flight information regions;
- (b) control areas and control zones including—
 - (i) portions of the airspace where it is determined that air traffic control services shall be provided to IFR flights designated as control areas or control zones;
 - (ii) portions of controlled airspace where it is determined that air traffic control service shall be provided to VFR flights designated as Classes B, C, or D airspace; and
 - (iii) where designated within a flight information region, control areas and control zones shall form part of that flight information region;
- (c) controlled aerodromes;
- (d) reduced vertical separation minima airspace;
- (e) a sector, where the authority considers such designation is necessary to facilitate the provision of air traffic services within the flight information region; and
- (f) air traffic services routes and significant points along the routes.

(3) The authority may designate portions of the airspace as special use airspace where it considers such airspace necessary in the interest of safety, national security or public interest.

(4) Subject to subregulation (3), special use airspace may be designated as—

- (a) restricted areas;
- (b) prohibited areas;
- (c) danger areas;

- (d) low flying zone; and
- (e) flight training areas.

(5) The lateral limits of the airspaces designated under this regulation shall be defined by—

- (a) geographical coordinates;
- (b) prominent geographical lines, circles or any part of a circle of a specified radius or great circle between two points or a parallel of latitude.

(6) The vertical limits of airspaces designated under these Regulations shall be defined by heights, altitudes or flights levels.

(7) The authority shall publish the designation of particular portions of the airspace in the Aeronautical Information Publication.

10. Classification of airspaces

(1) The authority shall classify designated controlled airspace as specified in Schedule 1 to these Regulations.

(2) The authority shall select airspace classes in accordance with the needs of Uganda.

(3) The requirements for flights within each class of airspace are specified in Schedule 1 to these Regulations.

11. Performance-Based Navigation operations

(1) ATS provider shall implement performance based navigation within designated airspaces and aerodromes in accordance with requirements prescribed by the authority.

(2) The authority shall prescribe navigation specification requirements for performance-based navigation operations on the basis of Africa and Indian Ocean Regional Air Navigation Agreements.

(3) In prescribing navigation specification requirements for performance-based navigation operations, the authority shall consider any limitations arising from navigation infrastructure constraints or specific navigation functionality requirements.

(4) The prescribed navigation specification requirements shall be appropriate to the level of communications, navigation and air traffic services provided in the airspace of Uganda.

12. Performance-based communication operations

(1) The authority shall prescribe required communication performance specifications when applying performance-based communication.

(2) Where applicable, the required communication performance specifications shall be prescribed on the basis of Africa and Indian Ocean regional air navigation agreements.

(3) The prescribed communication performance specification shall be appropriate to the air traffic services provided in the airspace.

13. Performance-Based Surveillance operations

(1) The authority shall prescribe the required surveillance performance specifications when applying performance-based surveillance.

(2) Where applicable, the required surveillance performance specifications shall be prescribed on the basis of Africa and Indian Ocean Regional Air Navigation Agreements.

(3) The prescribed required surveillance performance specifications shall be appropriate to the air traffic services provided.

(4) The ATS units shall be provided with equipment capable of performance consistent with the prescribed required surveillance performance specifications, where applicable.

14. Establishment and designation of units providing ATS

The ATS shall be provided by units established and designated as —

- (a) flight information centers that shall provide flight information services and alerting services within flight information regions;
- (b) air traffic control units shall provide air traffic control service, flight information services and alerting services within control areas, control zones and at controlled aerodromes; or
- (c) where there is no flight information center, an air traffic control unit having adequate facilities shall be assigned the responsibility of providing the flight information services and alerting services within flight information regions.

15. Specifications for flight information regions, control areas and control zones

(1) The delineation of airspace, where air traffic services are to be provided, shall be related to the nature of the route structure and the need for efficient service rather than to national boundaries.

(2) Flight information regions shall be delineated to cover the whole of the air route structure to be served by the regions.

(3) A flight information region shall include all airspace within its lateral limits except where limited by an upper flight information region.

(4) Where a flight information region is limited by an upper flight information region, the lower limit specified for the upper flight information region shall constitute the upper vertical limit of the flight information region and shall coincide with a VFR cruising level prescribed in the Civil Aviation (Rules of the Air) Regulations, 2020.

(5) The control areas including, airways and terminal control areas shall be delineated so as to encompass sufficient airspace to contain the flight paths of the IFR flights or portions to which it is desired, to provide the applicable air traffic control service, taking into account the capabilities of the navigation aids normally used in that area.

(6) A lower limit of a control area shall be established at a height above the ground or water of not less than 200 m or 700 ft.

(7) Where practicable and desirable in order to allow freedom of action for VFR flights below the control area, the lower limit of a control area shall be established at a greater height than the minimum specified in subregulation (6).

(8) When the lower limit of a control area is above 900 m (3 000 ft) above Mean Sea Level it shall coincide with a VFR cruising level prescribed in the Civil Aviation (Rules of the Air) Regulations, 2020.

(9) An upper limit of a control area shall be established where—

- (a) air traffic control service will not be provided above such upper limit; or
- (b) the control area is situated below an upper control area, in which case the upper limit shall coincide with the lower limit of the upper control area.

(10) Where established, the upper limit referred to in subregulation (9), shall coincide with a VFR cruising level prescribed in the Civil Aviation (Rules of the Air) Regulations, 2020.

16. Flight information regions or control areas in upper airspace

Where it is desirable to limit the number of flight information regions or control areas through which high flying aircraft would otherwise have to operate, a flight information region or control area,

as appropriate, shall be delineated to include the upper airspace within the lateral limits of a number of lower flight information regions or control areas.

17. Control zones

(1) The lateral limits of control zones shall encompass at least the portions of the airspace, which are not within control areas, containing the paths of IFR flights arriving at and departing from aerodromes to be used under instrument meteorological conditions.

(2) The lateral limits of a control zone shall extend to at least 9.3 km (5 NM) from the center of the aerodrome or aerodromes concerned in the directions from which approaches may be made.

(3) Where a control zone is located within the lateral limits of a control area, it shall extend upwards from the surface of the earth to at least the lower limit of the control area.

(4) Where a control zone is located outside of the lateral limits of a control area, an upper limit shall be established.

(5) Where it is desired to establish the upper limit of a control zone at a level higher than the lower limit of the control area established above it, or where the control zone is located outside of the lateral limits of a control area, its upper limit shall be established at a level which can easily be identified by pilots.

(6) Where the limit in subregulation (5) is above 900m or 3 000ft above Mean Sea Level, it shall coincide with a VFR cruising level prescribed in the Civil Aviation (Rules of the Air) Regulations 2020.

18. Identification of air traffic services units and airspaces

(1) An area control center or flight information center shall be identified by the name of a nearby town or city or geographic feature.

(2) An aerodrome control tower or approach control unit shall be identified by the name of the aerodrome at which it is located.

(3) A control zone, control area or flight information region shall be identified by the name of the unit having jurisdiction over such airspace.

19. Establishment and identification of ATS routes

(1) Where the ATS routes are established, a protected airspace along each air traffic services route and a safe spacing between adjacent air traffic services routes shall be provided.

(2) Where warranted by density, complexity or nature of the traffic, special routes shall be established for use by low-level traffic.

(3) When determining the lateral spacing between routes in subregulation (1), account shall be taken of the navigational means available and the navigation equipment carried on board helicopters.

(4) Air Navigation Services Provider shall ensure that the ATS routes are identified by designators specified in Schedule 2 to these Regulations.

(5) The designators for ATS routes other than standard departure and arrival routes shall be selected in accordance with the principles specified in Schedule 2 to these Regulations.

(6) Standard departure and arrival routes and associated procedures shall be identified in accordance with the principles specified in Schedule 3 to these Regulations.

20. Establishment of change-over points

(1) Air Navigation Services Provider shall establish change-over points on ATS route segments defined by reference to very high frequency omni-directional radio ranges where this will assist accurate navigation along the route segments.

(2) The establishment of change-over points referred to in subregulation (1) shall be limited to route segments of 110 km or 60 NM or more, except where the complexity of air traffic services routes, the density of navigation aids or other technical and operational reasons warrant the establishment of change-over points on shorter route segments.

(3) Unless otherwise established in relation to the performance of the navigation aids or frequency protection criteria, the change-over point on a route segment shall be the mid-point between the facilities in the case of a straight route segment or the intersection of radials in the case of a route segment which changes direction between the facilities.

21. Establishment and identification of significant points

(1) Air Navigation Services Provider shall establish significant points for the purpose of defining an ATS route or instrument approach procedure or in relation to the requirements of ATS for information regarding the progress of aircraft in flight.

(2) Significant points referred to in subregulation (1) shall be identified by designators and established in accordance with the principles specified in the Schedule 4 to these Regulations.

22. Coordination between the operator and ATS

(1) The ATS units shall adhere to the requirements of the operators specified in the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022, the Civil Aviation (Operation of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022 and the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022.

(2) The ATS units shall make available to the operators or their designated representatives such information as may be available.

(3) The air traffic services units shall provide the operator or a designated representative whenever requested, with messages including position reports, in so far as practicable in accordance with agreed procedures.

23. Coordination between military authorities and air traffic services

(1) Air Navigation Services Provider shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft.

(2) The coordination of activities potentially hazardous to civil aircraft shall be effected in accordance with regulation 24.

(3) Air Navigation Services Provider shall make arrangements to permit information relevant to the safe and expeditious conduct of flights of civil aircraft to be promptly exchanged between air traffic services units and appropriate military units.

(4) ATS units shall in accordance with agreed procedures provide appropriate military units with pertinent flight plan and other data concerning flights of civil aircraft.

(5) Air Navigation Services Provider shall designate areas or routes where the requirements of the Civil Aviation (Rules of the Air) Regulations, 2020 concerning flight plans, two-way communications and position reporting apply to all flights to facilitate identification of civil aircraft.

(6) Air Navigation Services Provider shall establish procedures to ensure that—

- (a) ATS units are notified if a military unit observes that an aircraft which is, or might be, a civil aircraft is approaching, or has entered any area in which interception might become necessary; and

- (b) all possible efforts are made to confirm the identity of the aircraft and to provide the aircraft with the navigational guidance necessary to avoid the need for interception.

24. Coordination of activities potentially hazardous to civil aircraft

(1) The arrangements for activities potentially hazardous to civil aircraft over the territory of Uganda shall be coordinated with the appropriate ATS authorities.

(2) The coordination shall be effected to permit timely promulgation of information regarding the activities referred to in subregulation (1) in accordance with the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

(3) The initial coordination shall, if the organisation planning the activities is located in another State, be effected through the ATS authority responsible for the airspace over the State where the organisation is located.

(4) The objective of the coordination shall be to achieve the best arrangements which may avoid hazards to civil aircraft and minimise interference with the normal operations of such aircraft.

(5) In determining the arrangements in subregulation (4), the appropriate ATS authorities shall apply the following conditions—

- (a) the locations or areas, times and durations for the activities shall be selected to avoid closure or realignment of established air traffic services routes, blocking of the most economic flight levels or delays of scheduled aircraft operations, unless no other options exist;
- (b) the size of the airspace designated for the conduct of the activities shall be kept as small as possible; and

(c) direct communication between the appropriate ATS authority or ATS unit and the organisation or unit conducting the activities shall be provided for use in the event that civil aircraft emergencies or other unforeseen circumstances require discontinuation of the activities.

(6) The appropriate ATS authorities shall be responsible for initiating the promulgation of information regarding the activities.

(7) Air Navigation Services Provider shall establish special committees, as necessary, where activities potentially hazardous to civil aircraft take place on a regular or continuing basis, to ensure that the requirements of all parties concerned are adequately coordinated.

(8) Air Navigation Services Provider shall take adequate steps to prevent emission of laser beams from adversely affecting flight operations.

(9) Air Navigation Services Provider shall establish procedures providing for a flexible use of airspace reserved for military or other special activities in order to provide added airspace capacity and to improve efficiency and flexibility of aircraft operations.

(10) The procedures referred to in subregulation (9) shall permit all airspace users to have safe access to such reserved airspace.

(11) Air Navigation Services Provider shall ensure that a safety risk assessment is conducted as soon as practicable for activities potentially hazardous to civil aircraft and that appropriate risk mitigation measures are implemented.

(12) Air Navigation Services Provider shall establish procedures to enable the organisation or unit conducting or identifying activities potentially hazardous to civil aircraft and contribute to the safety risk assessment to facilitate consideration of all relevant safety-significant factors.

25. Aeronautical data

(1) The determination and reporting of ATS related aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end user of aeronautical data.

(2) Digital data error detection techniques shall be used during the transmission and storage of aeronautical data and digital data sets.

26. Coordination between meteorological and air traffic services authorities

(1) The meteorological service provider and Air Navigation Services Provider shall make arrangements to ensure that aircraft receive the most up-to-date meteorological information for aircraft operations.

(2) The meteorological service provider and Air Navigation Services Provider shall make arrangements where necessary for air traffic personnel to—

- (a) report if observed by ATS personnel or communicated by aircraft, such other meteorological elements as may be agreed upon in addition to using indicating instruments;
- (b) report as soon as possible to the associated meteorological office meteorological phenomena of operational significance, if observed by ATS personnel or communicated by aircraft, which have not been included in the aerodrome meteorological report; and
- (c) report as soon as possible to the associated meteorological office pertinent information concerning pre-eruption volcanic activity, volcanic eruptions and information concerning volcanic ash cloud.

(3) Area Control Centers and Flight Information Centers shall report the information referred to in subregulation (2) (c) to the Associated Meteorological Watch Office and VAAC.

(4) Area Control Centers, Flight Information Centers and Associated Meteorological Watch Offices shall maintain close coordination to ensure that information on volcanic ash included in NOTAM and SIGMET messages is consistent.

27. Coordination between aeronautical information services and air navigation services provider

(1) Aeronautical information services and consistency provider shall make arrangements to ensure aeronautical information services units obtain information to enable units to provide up-to-date pre-flight information and to meet the need for in-flight information.

(2) Arrangements shall be made between aeronautical information services and air traffic services departments responsible for air traffic services to report to the responsible aeronautical information services unit, with a minimum of delay on—

- (a) information on aerodrome conditions;
- (b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
- (c) the occurrence of volcanic activity observed by air traffic services personnel or reported by aircraft; and
- (d) any other information considered to be of operational significance.

(3) Before introducing changes to the air navigation system, the responsible departments shall—

- (a) take into account the time needed by the aeronautical information service for the preparation, production and issuance of relevant material for promulgation; and

(b) ensure close coordination for timely provision of the information to the aeronautical information service.

(4) The responsible departments referred to in subregulation (3) shall ensure that the changes to aeronautical information that affect charts or computer based navigation systems which qualify to be notified by the Aeronautical Information Regulation and Control system comply with the requirements specified in the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

(5) Subject to subregulation (4) the AIRAC effective dates shall be observed by the responsible air traffic services when submitting the raw information or data to aeronautical information services.

(6) The ATS responsible for the provision of raw aeronautical information or data to the aeronautical information services shall take into account the accuracy and integrity requirements for aeronautical data prescribed in the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

28. Minimum flight altitudes

(1) The authority shall determine and promulgate minimum flight altitudes for each ATS route and control area.

(2) The minimum flight altitudes determined in subregulation (1) shall provide a minimum clearance above the controlling obstacle located within the areas concerned.

29. Service to aircraft in event of an emergency

(1) An aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference, shall be given maximum consideration, assistance and priority over other aircraft as necessitated by the circumstances.

(2) An aircraft equipped with an appropriate data link capability or a secondary surveillance radar transponder to indicate

that the aircraft is in a state of emergency, shall operate the equipment as follows—

- (a) on Mode A, Code 7700;
- (b) on Mode A, Code 7500, to indicate specifically that it is being subjected to unlawful interference;
- (c) activate the appropriate emergency or urgency capability of ADS-B or ADS-C; or
- (d) transmit the appropriate emergency message via CPDLC.

(3) Human factors principles shall be observed in communications between ATS units and aircraft in the event of an emergency.

(4) The ATS units shall promptly attend to requests by an aircraft when an occurrence of unlawful interference with the aircraft takes place or is suspected.

(5) Information pertinent to the safe conduct of the flight referred to in subregulation (4) shall be transmitted and the necessary action taken to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft.

(6) The ATS units shall, in accordance with agreed procedures, immediately inform the appropriate authority designated by the State and exchange necessary information with the operator or its designated representative where an occurrence of unlawful interference with an aircraft takes place or is suspected.

30. Strayed and unidentified aircraft

(1) An ATS unit shall take all necessary steps specified in subregulations (2) and (3) to assist strayed aircraft and to safeguard its flight as soon as the unit becomes aware of the strayed aircraft.

(2) The ATS unit shall, where the position of the aircraft is not known—

- (a) attempt to establish two-way communication with the aircraft, unless such communication already exists;
- (b) use all available means to determine its position;
- (c) inform other ATS units into whose area the aircraft may have strayed or may stray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;
- (d) inform, in accordance with agreed procedures, appropriate military units and provide them with pertinent flight plan and other data concerning strayed aircraft; and
- (e) request from the units referred to in paragraphs (c) and (d) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position.

(3) The ATS unit shall, when the position of an aircraft is established—

- (a) advise the aircraft of its position and corrective action to be taken; and
- (b) provide, as necessary, other ATS units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft.

(4) Where an ATS unit becomes aware of an unidentified aircraft in its area, the ATS unit shall endeavour to establish the identity of the aircraft in accordance with agreed procedures.

(5) Subject to subregulation (4), the ATS unit shall take the following steps to identify the unidentified aircraft—

- (a) attempt to establish two-way communication with the aircraft;
- (b) inquire of other ATS units within the flight information region about the flight and request their assistance in establishing two-way communication with the aircraft;
- (c) inquire of ATS units serving the adjacent flight information regions about the flight and request their assistance in establishing two-way communication with the aircraft; and
- (d) attempt to obtain information from other aircraft in the area.

(6) The ATS unit shall, inform the appropriate military unit as soon as the identity of the aircraft is established.

(7) The appropriate security agency shall immediately be informed, in accordance with agreed procedures where the ATS unit considers that a strayed or unidentified aircraft may be the subject of unlawful interference.

31. Interception of civil aircraft

(1) The ATS unit shall, where the unit learns that an aircraft is intercepted in its area of responsibility, take the following steps as are appropriate in the circumstances—

- (a) attempt to establish two-way communication with the intercepted aircraft via any means available, including the emergency radio frequency 121.5 MHz, unless such communication already exists;
- (b) inform the pilot of the intercepted aircraft of the interception;
- (c) establish contact with the intercept control unit maintaining two-way communication with the intercepting aircraft and provide it with available information concerning the aircraft;

- (d) relay messages between the intercepting aircraft or the intercept control unit and the intercepted aircraft, as necessary;
- (e) in close coordination with the intercept control unit take all necessary steps to ensure the safety of the intercepted aircraft;
- (f) inform ATS units serving adjacent flight information regions if it appears that the aircraft has strayed from such adjacent flight information regions.

(2) The ATS unit shall, when it learns that an aircraft is being intercepted outside its area of responsibility, take the following steps that are appropriate in the circumstances—

- (a) inform the ATS unit serving the airspace in which the interception is taking place, providing the unit with available information that will assist in identifying the aircraft and request it to take action in accordance with subregulation (1);
- (b) relay messages between the intercepted aircraft and the appropriate ATS unit, the intercept control unit or the intercepting aircraft.

32. Time in air traffic services

(1) The ATS units shall use Coordinated Universal Time and shall express the time in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

(2) The ATS units shall be equipped with clocks indicating the time in hours, minutes and seconds, clearly visible from each operating position in the unit concerned.

(3) The ATS unit clocks and other time recording devices shall be checked as necessary to ensure correct time to within plus or minus 30 seconds of Coordinated Universal Time.

(4) When data link communications are utilised by an ATS unit, clocks and other time-recording devices shall be checked as necessary to ensure correct time to within 1 second of Coordinated Universal Time.

(5) The correct time shall be obtained from a standard time station or, if not possible, from another unit which has obtained the correct time from the station.

(6) Aerodrome control towers shall, prior to an aircraft taxiing for take-off, provide the pilot with the correct time, unless arrangements have been made for the pilot to obtain it from other sources.

(7) ATS units shall provide aircraft with the correct time on request and time checks shall be given to the nearest half minute.

33. Establishment of requirements for carriage and operation of pressure-altitude reporting transponders

The authority shall establish requirements for carriage and operation of pressure-altitude reporting transponders within defined portions of airspace.

34. Safety management

(1) Air Navigation Services Provider shall establish a safety management system in accordance with the Civil Aviation (Safety Management) Regulations 2022.

(2) Air Navigation Services Provider shall document all activities undertaken in an ATS safety management system and shall retain all documentation for a period of time as specified by the authority.

(3) Air Navigation Services Provider shall ensure that any significant safety-related change to the ATS system are effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted.

(4) An Air Navigation Service provider shall systematically review safety-related reports concerning—

- (a) the operation of ATS, including air traffic incident reports, in order to detect any adverse trend in the number and types of incidents which occur; and
- (b) the serviceability of ATS facilities and systems, such as failures and degradations of communications, surveillance and other safety significant systems and equipment in order to detect any trend in the operation of such systems which may have an adverse effect on safety.

(5) Air Navigation Services Provider shall ensure that the safety reviews of ATS units are conducted on a regular and systematic basis by personnel qualified through training, experience and expertise and having a full understanding of the relevant regulations, procedures for air navigation services, safe operating practices and human factors principles.

(6) Air Navigation Services Provider shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.

(7) Air Navigation Services Provider shall carry out safety assessment in respect of proposals for significant airspace reorganisations, significant changes in the provision of ATS procedures applicable to an airspace or an aerodrome and for the introduction of new equipment, systems or facilities, including—

- (a) a reduced separation minimum to be applied within an airspace or at an aerodrome;
- (b) a new operating procedure, including departure and arrival procedures, to be applied within an airspace or at an aerodrome;
- (c) a reorganisation of the ATS route structure;

- (d) a re-sectorisation of an airspace;
- (e) physical changes to the layout of runways or taxiways at an aerodrome; and
- (f) implementation of new communications, surveillance or other safety-significant systems and equipment, including those providing new functionality or capabilities.

(8) The proposals referred to in subregulation (7) shall be implemented only where the assessment has shown that an acceptable level of safety will be met.

(9) The safety assessment referred to in subregulation (7) shall consider all relevant factors determined to be safety-significant, including—

- (a) the types of aircraft and their performance characteristics, including aircraft navigation capabilities and navigation performance;
- (b) the traffic density and distribution;
- (c) the airspace complexity, ATS route structure and classification of the airspace;
- (d) the aerodrome layout, including runway configurations, runway lengths and taxiway configurations;
- (e) the type of air-ground communications and time parameters for communication dialogues, including controller intervention capability;
- (f) the type and capabilities of surveillance system and the availability of systems providing controller support and alert functions;
- (g) where ADS-B implementation envisages reliance upon a common source for surveillance or navigation, the safety

assessment shall take account of adequate contingency measures to mitigate the risk of either degradation or loss of this common source; and

(h) any significant local or regional weather phenomena.

(10) Air Navigation Services Provider shall assess and classify for its risk acceptability any actual or potential hazard related to the provision of ATS within an airspace or at an aerodrome, whether identified through an ATS safety management activity or by any other means.

(11) Air Navigation Services Provider shall, as a matter of priority and as far as practicable, implement appropriate measures to eliminate the risk or reduce the risk to a level that is acceptable.

(12) Air Navigation Services Provider shall, as a matter of priority and as far as practicable, implement appropriate remedial measures if it becomes apparent that the level of safety applicable to an airspace or an aerodrome is not, or may not be achieved.

(13) The implementation of any remedial measure referred to in subregulation (12) shall be followed by an evaluation of the effectiveness of the measure in eliminating or mitigating a risk.

(14) Any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted.

(15) Air Navigation Services Provider, shall provide adequate post-implementation monitoring to verify that the defined level of safety continues to be met.

(16) Air Navigation Services Provider shall participate in runway safety programmes established by aerodrome operators to

enhance runway safety using collaborative approach that involves safety inspectors of the authority, aircraft operators, aerodrome operators.

35. Fatigue management

Air Navigation Services Provider shall manage fatigue in accordance with the requirements set out in the Civil Aviation (Fatigue Management) Regulations, 2022.

36. Horizontal reference system

(1) The Air Navigation Services provider shall use World Geodetic System-1984 as the horizontal - reference system for air navigation.

(2) The Air Navigation Services provider shall ensure that the reported aeronautical geographical coordinates indicating latitude and longitude are expressed in terms of the World Geodetic System -1984 geodetic reference datum.

37. Vertical reference system

The air navigation services provider shall ensure that mean sea level datum, which gives the relationship of gravity-related height or elevation to a surface known as the geoids are used as the vertical reference system for air navigation.

38. Temporal reference system

(1) The Air Navigation Services provider shall use the Gregorian calendar and Coordinated Universal Time as the temporal reference system for air navigation.

(2) Where the Air Navigation Services provider uses a different temporal reference system, the temporal reference system used shall be indicated in the Aeronautical Information Publication.

39. Language proficiency

(1) An air navigation services provider shall ensure that air traffic controllers speak and understand the languages used

for radiotelephony communication as specified in Civil Aviation (Personnel Licensing) Regulations, 2022.

(2) The English language shall be used for communications between air traffic control units except when conducted in a mutually agreed language.

40. Contingency arrangements

(1) The Air Navigation Services provider shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of ATS and related supporting services in the airspace for which they are responsible for the provision of the services.

(2) The contingency plans shall be developed with the assistance of International Civil Aviation Organisation in coordination with the ATS authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

41. Identification and delineation of prohibited, restricted and danger areas

(1) The authority shall establish prohibited, restricted or danger areas and promulgate their identification and full details in the Aeronautical Information Publication.

(2) The identification referred to in subregulation (1) shall be used to identify the area in all subsequent notifications pertaining to that area.

(3) The identification referred to in subregulation (1) shall be composed of a group of letters and figures as follows —

- (a) nationality letters for location indicators assigned to Uganda;

- (b) a letter **P** for prohibited area, **R** for restricted area and **D** for danger area as appropriate; and
- (c) a number, unduplicated within Uganda.

(4) Identification numbers shall not be reused for a period of at least one year after cancellation of the area to which the identification numbers refer to avoid confusion.

(5) Where a prohibited, restricted or danger area is established, the area shall be as small as practicable and be contained within simple geometrical limits, to permit ease of reference.

42. Instrument flight procedure design service

The authority shall ensure that an instrument flight procedure design service is in place in accordance with Schedule 5 to these Regulations.

PART III— AIR TRAFFIC CONTROL SERVICE

43. Application of air traffic control service

The Air Navigation Services provider shall provide air traffic control service to—

- (a) IFR flights in airspace Classes A, B, C, D and E;
- (b) VFR flights in airspace Classes B, C and D;
- (c) special VFR flights; and
- (d) aerodrome traffic at controlled aerodromes.

44. Provision of air traffic control service

The parts of air traffic control service referred to in regulation 7 shall be provided by the following units—

- (a) area control service shall be provided by—
 - (i) an area control center; or

- (ii) the unit providing approach control service in a control zone or in a control area of limited extent which is designated primarily for the provision of approach control service and where no area control center is established;
- (b) approach control service shall be provided by—
 - (i) an aerodrome control tower or area control center where it is necessary or desirable to combine under the responsibility of one unit the functions of the approach control service with those of the aerodrome control service or the area control service;
 - (ii) an approach control unit where it is necessary or desirable to establish a separate unit; and
- (c) aerodrome control service shall be provided by an aerodrome control tower.

45. Operation of air traffic control service

- (1) An air traffic control unit shall—
 - (a) be provided with information on the intended movement of each aircraft or variations and with current information on the actual progress of each aircraft;
 - (b) determine from the information received, the relative positions of known aircraft to each other;
 - (c) issue clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic;
 - (d) coordinate clearances as necessary with other units—
 - (i) whenever an aircraft might otherwise conflict with traffic operated under the control of such other units; and

- (ii) before transferring control of an aircraft to the other units.

(2) The air traffic control units shall display information on aircraft movements, together with a record of air traffic control clearances issued to the aircraft, to permit ready analysis and to maintain an efficient flow of air traffic with adequate separation between aircraft.

(3) Air traffic control units shall be equipped with devices that record background communication and the aural environment at air traffic controller work stations, capable of retaining the information recorded during at least the last twenty-four hours of operation.

(4) Clearances issued by air traffic control units shall provide separation between—

- (a) all flights in airspace Classes A and B;
- (b) IFR flights in airspace Classes C, D and E;
- (c) IFR flights and VFR flights in airspace Class C;
- (d) IFR flights and special VFR flights;
- (e) special VFR flights when so prescribed by the appropriate air traffic services authority.

(5) A flight may be cleared without separation being provided in respect of a specific portion of the flight conducted in visual meteorological conditions when requested by an aircraft and if so prescribed by the appropriate air traffic services authority for the cases listed under subregulation (4) (b) in airspace Classes D and E.

(6) Separation by an air traffic control unit shall be obtained by at least one of the following—

- (a) vertical separation, obtained by assigning different levels selected from—

- (i) the appropriate table of cruising levels prescribed in the Civil Aviation (Rules of the Air) Regulations, 2020; or
- (ii) a modified table of cruising levels, when so prescribed in accordance with the Civil Aviation (Rules of the Air) Regulations, 2020 for flight above flight level 410,

except that the correlation of levels to track as prescribed in this paragraph shall not apply whenever otherwise indicated in appropriate Aeronautical Information Publications or air traffic control clearances;

- (b) horizontal separation, obtained by providing—
 - (i) longitudinal separation, by maintaining an interval between aircraft operating along the same, converging or reciprocal tracks, expressed in time or distance; or
 - (ii) lateral separation, by maintaining aircraft on different routes or in different geographical areas;
- (c) composite separation, consisting of a combination of vertical separation and one of the other forms of separation contained in the paragraph(b) using minima for each which may be lower than, but not less than half of, those used for each of the combined elements when applied individually.

(7) Composite separation referred to in subregulation (6)(c) shall only be applied on the basis of Africa and Indian Ocean regional air navigation agreements.

(8) The air navigation services provider shall institute a programme in coordination with the region, to monitor the height-keeping performance of aircraft operating at a reduced vertical separation minimum of 300 m (1000ft) as applied between flight level 290 and flight level 410 inclusive, to ensure that the continued

application of the vertical separation minimum meets the safety objectives.

(9) The scope of regional monitoring programmes referred to in subregulation (8) shall be adequate to conduct analyses of aircraft group performance and evaluate the stability of altimetry system error.

(10) Where Required Communication Performance or Required Surveillance Performance specifications are applied, programmes shall be instituted for monitoring the performance of the infrastructure and the participating aircraft against the appropriate RCP or RSP specifications, to ensure that operations in the applicable airspace continue to meet safety objectives.

(11) The scope of monitoring programmes shall be adequate to evaluate communication or surveillance performance.

46. Separation minima

(1) The selection of separation minima for application within a given portion of airspace shall be as follows—

- (a) the separation minima shall be selected from those prescribed by the provisions of the Procedures of Air Navigation Services Air Traffic Management and the Regional Supplementary Procedures under the prevailing circumstances except, where types of aids are used or circumstances prevail which are not covered by these Regulations, other separation minima shall be established as necessary by the appropriate air traffic services authority following consultation with operators, for routes or portions of routes contained within the sovereign airspace of Uganda;
- (b) the selection of separation minima shall be made in consultation between the appropriate air traffic services authorities responsible for the provision of air traffic services in neighbouring airspace when—

- (i) traffic passes from one into the other of the neighbouring airspaces;
- (ii) routes are closer to the common boundary of the neighbouring airspaces than the separation minima applicable in the circumstances.

(2) Details of the selected separation minima and their areas of application shall be notified—

- (a) to the air traffic services units concerned; and
- (b) to pilots and operators through aeronautical information publications, where separation is based on the use by aircraft of specified navigation aids or specified navigation techniques.

47. Responsibility for control

(1) A controlled flight shall be under the control of only one air traffic control unit at any given time.

(2) Responsibility for the control of all aircraft operating within a given block of airspace shall be vested in a single air traffic control unit.

(3) The control of an aircraft or groups of aircraft may be delegated to other air traffic control units provided that coordination between all air traffic control units concerned is assured.

48. Place or time of transfer of responsibility for control

The responsibility for the control of an aircraft shall be transferred from one air traffic control unit in the manner set out in Schedule 6 to these Regulations.

49. Coordination of transfer of responsibility for control

(1) The responsibility for control of an aircraft shall not be transferred from one air traffic control unit to another air traffic control

unit without the consent of the accepting control unit, which shall be obtained in accordance with subregulations (2), (3), (4) and (5).

(2) The transferring control unit shall communicate to the accepting control unit the appropriate parts of the current flight plan and any control information pertinent to the transfer requested.

(3) Where transfer of control is to be effected using radar or ADS-B data, the control information pertinent to the transfer shall include information regarding the position and, if required, the track and speed of the aircraft, as observed by radar or ADS-B immediately prior to the transfer.

(4) Where transfer of control is to be effected using ADS-C data, the control information pertinent to the transfer shall include the four-dimensional position and other information as necessary.

(5) The accepting control unit shall—

(a) indicate its ability to accept control of the aircraft on the terms specified by the transferring control unit, unless by prior agreement between the two units concerned, the absence of any such indication is understood to signify acceptance of the terms specified, or indicate any necessary changes; and

(b) specify any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer.

(6) The accepting control unit shall notify the transferring control unit when it has established two-way voice or data link communications with and assumed control of the aircraft concerned, unless otherwise specified by agreement between the two control units concerned.

(7) Applicable coordination procedures, including transfer of control points, shall be specified in letters of agreement and air traffic services unit instructions as appropriate.

50. Air traffic control clearances

Air traffic control clearances shall be based solely on the requirements for providing air traffic control service.

51. Contents of clearances

(1) An air traffic control clearance shall indicate—

- (a) aircraft identification as shown in the flight plan;
- (b) clearance limit;
- (c) route of flight;
- (d) levels of flight for the entire route or part of the route and changes of levels where required; and
- (e) any necessary instructions or information on other matters such as approach or departure manoeuvres, communications and the time of expiry of the clearance.

(2) Standard departure and arrival routes and associated procedures shall be established where necessary to facilitate—

- (a) the safe, orderly and expeditious flow of air traffic; and
- (b) the description of the route and procedure in air traffic control clearances.

52. Clearances for transonic flight

(1) The air traffic control clearance relating to the transonic acceleration phase of a supersonic flight shall extend at least to the end of that phase.

(2) The air traffic control clearance relating to the deceleration and descent of an aircraft from supersonic cruise to subsonic flight shall provide for uninterrupted descent, at least during the transonic phase.

53. Read-back of clearances and safety-related information

(1) The flight crew shall read back to the air traffic controller safety-related parts of air traffic control clearances and instructions which are transmitted by voice.

(2) The flight crew shall always read back the following items of Air Traffic Control clearances and instructions—

- (a) air traffic control route clearances;
- (b) clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway; and
- (c) runway-in-use, altimeter settings, secondary surveillance radar codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in ATIS broadcasts, transition levels.

(3) Other clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.

(4) The air traffic controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.

(5) The voice read-back of Controller Pilot Data Link Communication messages shall not be required unless specified by the appropriate air traffic services authority.

(6) Vehicle drivers who operate or intend to operate on the maneuvering area shall read back to the air traffic controller safety-related parts of instructions which are transmitted by voice like instructions to enter, hold short of, cross and operate, on any operational runway or taxiway.

(7) The air traffic controller shall listen to the read-back to ascertain that the instruction has been correctly acknowledged by the vehicle driver and shall take immediate action to correct any discrepancies revealed by the read-back.

54. Coordination of clearances

(1) An air traffic control clearance shall be coordinated between air traffic control units to cover the entire route of an aircraft or a specified portion of the route.

(2) An aircraft shall be cleared for the entire route to the aerodrome of first intended landing—

- (a) where it has been possible to coordinate the clearance between all the units under whose control the aircraft will come, prior to departure; or
- (b) where there is reasonable assurance that prior coordination will be effected between those units under whose control the aircraft will subsequently come.

(3) Where coordination referred to in subregulation (2) has not been achieved or is not anticipated, the aircraft shall be cleared only to that point where coordination is reasonably assured prior to reaching such point or at such point, the aircraft shall receive further clearance or holding instructions.

(4) Where authorised by the appropriate air traffic services authority, the aircraft shall contact a downstream air traffic control unit for the purpose of receiving a downstream clearance prior to the transfer of control point.

(5) Aircraft shall maintain the necessary two-way communication with the current air traffic control unit while obtaining a downstream clearance.

(6) A clearance issued as a downstream clearance shall be clearly identifiable as such to the pilot.

(7) Downstream clearances shall not affect the original flight profile of an aircraft in any airspace, other than that of the air traffic control unit responsible for the delivery of the downstream clearance unless the downstream clearance has been coordinated.

(8) The two-way voice communications between the pilot and the air traffic control unit providing the downstream clearance shall be available where data link communications are used to facilitate downstream clearance delivery.

(9) Where an aircraft intends to depart from an aerodrome within a control area to enter another control area within a period of thirty minutes, or such other specific period of time as has been agreed between the area control centers concerned, coordination with the subsequent area control center shall be effected prior to issuance of the departure clearance.

(10) When an aircraft intends to leave a control area for flight outside controlled airspace, and re-enter the same or another control area, a clearance from point of departure to the aerodrome of first intended landing shall be issued.

(11) Clearance or revisions referred to in subregulation (10) shall apply only to those portions of the flight conducted within controlled airspace.

55. ATS system capacity and air traffic flow management

(1) The Air Navigation Services provider shall determine and declare the capacity of the ATS system.

(2) The Air Navigation Services provider shall implement an air traffic flow management for airspace where air traffic demand at times exceeds or is expected to exceed, the declared capacity of the air traffic control services concerned.

(3) The air traffic flow management referred to in subregulation (2) shall be implemented on the basis of Africa and Indian Ocean regional air navigation agreements or, if appropriate, through multilateral agreements and the agreements shall make provision for common procedures and common methods of capacity determination.

(4) Where it becomes apparent to an air traffic control unit that traffic additional to that already accepted cannot be accommodated within a given period of time at a particular location or in a particular area, or can only be accommodated at a given rate, the air traffic control unit shall advise the air traffic flow management unit, where established, and where appropriate, the air traffic services units concerned.

(5) The flight crews of aircraft destined to the location or area and operators concerned shall be advised of the delays expected or the restrictions that will be applied under subregulation (4).

56. Control of persons and vehicles at aerodromes

(1) The movement of persons or vehicles including towed aircraft on the manoeuvring area of an aerodrome shall be controlled by the aerodrome control tower to avoid hazard to them or to aircraft landing, taxiing or taking off.

(2) In conditions where low visibility procedures are in operation the air navigation services provider shall ensure that—

- (a) persons and vehicles operating on the manoeuvring area of an aerodrome are restricted to the essential minimum, and particular regard is given to the requirements to protect the Instrument Landing System sensitive areas when Category II or Category III precision instrument operations are in progress;
- (b) subject to the provisions in subregulation (3), the minimum separation between vehicles and taxiing aircraft are as prescribed by the appropriate air traffic service authority taking into account the aids available;
- (c) when mixed Instrument Landing System Category II or Category III precision instrument operations are used on the same runway continuously, the more restrictive Instrument Landing System critical and sensitive areas are protected.

(3) The Air Navigation Services provider shall ensure that emergency vehicles proceeding to the assistance of an aircraft in distress are afforded priority over all other surface movement traffic.

(4) Subject to subregulation (3), vehicles on the manoeuvring area shall be required to comply with the following rules—

- (a) vehicles and vehicles towing aircraft shall give way to aircraft which are landing, taking off or taxiing;
- (b) vehicles shall give way to other vehicles towing aircraft;
- (c) vehicles shall give way to other vehicles in accordance with air traffic services unit instructions;
- (d) notwithstanding subparagraphs (a), (b) and (c), vehicles and vehicles towing aircraft shall comply with instructions issued by the aerodrome control tower.

57. Provision of radar and ADS-B service

The air navigation services provider shall ensure that radar and ADS-B ground systems provide for the display of safety-related alerts and warnings, including conflict alert, conflict prediction, minimum safe altitude warning and unintentionally duplicated secondary surveillance radar codes.

58. Use of surface movement radar

In the absence of visual observation of all or part of the manoeuvring area or to supplement visual observation, surface movement radar provided in the Civil Aviation (Aerodromes) Regulations, 2022 or other suitable surveillance equipment, shall be utilised by the aerodrome control tower to—

- (a) monitor the movement of aircraft and vehicles on the manoeuvring area;
- (b) provide directional information to pilots and vehicle drivers as necessary; and

- (c) provide advice and assistance for the safe and efficient movement of aircraft and vehicles on the manoeuvring area.

PART IV—FLIGHT INFORMATION SERVICE

59. Application of flight information service

(1) The ATS unit shall provide flight information services to all aircraft which are likely to be affected by the information and which are—

- (a) required to be provided with air traffic control service; or
- (b) otherwise known to the relevant air traffic services units.

(2) Where ATS units provide both flight information service and air traffic control service, the provision of air traffic control service shall have precedence over the provision of flight information service.

60. Scope of flight information service

(1) Flight information service shall include the provision of pertinent—

- (a) SIGMET information;
- (b) information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash clouds;
- (c) information concerning the release into the atmosphere of radioactive materials or toxic chemicals;
- (d) information on changes in the availability of radio navigation services;
- (e) information on changes in condition of aerodromes and associated facilities, including information on the state of the aerodrome movement areas when they are affected by significant depth of water;

- (f) information on unmanned free balloons; and
- (g) of any other information likely to affect safety.

(2) Flight information service provided to flights shall include, in addition to that outlined in subregulation (1), the provision of information concerning—

- (a) weather conditions reported or forecast at departure, destination and alternate aerodromes;
- (b) collision hazards, to aircraft operating in airspace classes C, D, E, F and G as specified in Schedule 1 to these Regulations;
- (c) for flight over water areas, in so far as practicable and when requested by a pilot, any available information such as radio call sign, position, true track or speed of surface vessels in the area.

(3) Air traffic services units shall transmit, as soon as practicable, special air-reports to other aircraft concerned, to the associated

meteorological office, and to other air traffic services units concerned for a period to be determined by agreement between the meteorological service provider and the Air Navigation Services provider concerned.

(4) Flight information service provided to VFR flights shall include, in addition to information set out in subregulation (1), the information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable.

61. Operational flight information service broadcasts

(1) The Air Navigation Services provider shall ensure that the meteorological information and operational information concerning radio navigation services and aerodromes included in

the flight information service is, whenever available, provided in an operationally integrated form.

(2) Where integrated operational flight information messages are to be transmitted to aircraft, they shall be transmitted with the content and, where specified, in the sequence indicated, for the various phases of flight.

(3) The Air Navigation Services provider shall ensure that here operational flight information service broadcasts is provided, consist of messages containing integrated information regarding selected operational and meteorological elements appropriate to the various phases of flight.

(4) The broadcasts referred to in subregulation (3) are of the following types—

- (a) high frequency;
- (b) very high frequency; and
- (c) automatic terminal information service.

(5) The applicable operational flight information service messages shall be transmitted by the appropriate air traffic services unit when requested by the pilot.

62. High frequency operational flight information service broadcasts

(1) The Air Navigation Services provider shall provide high frequency operational flight information service broadcasts where it has been determined by Africa Indian Ocean regional air navigation agreements.

(2) Whenever the high frequency operational flight information service broadcasts are provided—

- (a) the information shall be in accordance with regulation 61(5), as applicable, subject to the Africa and Indian Ocean regional air navigation agreements;
- (b) the aerodromes for which reports and forecasts are to be included shall be as determined by the Africa and Indian Ocean regional air navigation agreements;
- (c) the time-sequencing of stations participating in the broadcast shall be as determined by the Africa and Indian Ocean regional air navigation agreements;
- (d) the high frequency operational flight information service broadcast message shall take into consideration human performance;
- (e) the broadcast message shall not exceed the length of time allocated for the broadcast by the Africa and Indian Ocean regional air navigation agreements, care being taken that the readability is not impaired by the speed of the transmission;
- (f) each aerodrome message shall be identified by the name of the aerodrome to which the information applies;
- (g) when information has not been received in time for a broadcast, the latest available information shall be included together with the time of that observation;
- (h) the full broadcast message shall be repeated if this is feasible within the remainder of the time allotted to the broadcasting station;
- (i) the broadcast information shall be updated immediately a significant change occurs; and
- (j) the high frequency operational flight information service message shall be prepared and disseminated by the most appropriate units as designated by the authority.

(3) High frequency operational flight information service broadcast messages shall contain the following information in the sequence indicated—

- (a) significant en-route weather information as prescribed in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022;
- (b) aerodrome information including—
 - (i) name of aerodrome;
 - (ii) time of observation;
 - (iii) essential operational information;
 - (iv) surface wind direction and speed; if appropriate, maximum wind speed;
 - (v) visibility and, when applicable, runway visual range;
 - (vi) present weather;
 - (vii) cloud below 1 500m (5 000ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available; and
 - (viii) aerodrome forecast; or as determined by Africa Indian Ocean regional air navigation agreements.

63. VHF operational flight information service broadcasts.

(1) The Air Navigation Services provider shall provide very high frequency operational flight information service broadcasts as determined by Africa and Indian Ocean Regional Air Navigation Agreements.

(2) Whenever very high frequency operational flight information service broadcasts referred to in subregulation (1) are provided—

- (a) the aerodromes for which reports and forecasts are to be included shall be as determined by Africa and Indian Ocean Regional Air Navigation Agreements;
- (b) each aerodrome message shall be identified by the name of the aerodrome to which the information applies;
- (c) when information has not been received in time for a broadcast, the latest available information shall be included together with the time of that observation;
- (d) the broadcasts shall be continuous and repetitive;
- (e) the very high frequency operational flight information service broadcast message shall take into consideration human performance;
- (f) the broadcast message shall, whenever practicable, not exceed five minutes, care being taken that the readability is not impaired by the speed of the transmission;
- (g) the broadcast message shall be updated on a scheduled basis as determined by the Africa and Indian Ocean Regional Air Navigation Agreements and shall be updated immediately a significant change occurs; and
- (h) the very high frequency operational flight information service message shall be prepared and disseminated by the most appropriate units as designated by the authority.

(3) Very high frequency operational flight information service broadcast messages shall contain the following information in the sequence indicated —

- (a) name of aerodrome;
- (b) time of observation;

- (c) landing runway;
- (d) significant runway surface conditions and, if appropriate, braking action;
- (e) changes in the operational state of the radio navigation services, if appropriate;
- (f) holding delay, if appropriate;
- (g) surface wind direction and speed; if appropriate, maximum wind speed;
- (h) visibility and, when applicable, runway visual range;
- (i) present weather;
- (j) cloud below 1 500m or 5 000ft or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility, when available;
- (k) air temperature;
- (l) dew point temperature;
- (m) QNH altimeter setting;
- (n) supplementary information on recent weather of operational significance and, where necessary, wind shear;
- (o) trend forecast, when available; and
- (p) notice of current significant meteorological information messages.

64. Voice-automatic terminal information service broadcasts

(1) The Air Navigation Services provider shall provide voice-automatic terminal information service broadcasts at aerodromes where there is a requirement to reduce the communication load on the air traffic service very high frequency air-ground communication channels.

(2) Where provided, the voice-automatic terminal information service broadcasts referred to in subregulation (1) shall comprise—

- (a) one broadcast serving arriving aircraft;
- (b) one broadcast serving departing aircraft;
- (c) one broadcast serving both arriving and departing aircraft; or
- (d) two broadcasts serving arriving and departing aircraft respectively at those aerodromes where the length of a broadcast serving both arriving and departing aircraft would be excessively long.

(3) A discrete very high frequency shall, whenever practicable, be used for Voice-ATIS broadcasts.

(4) Where a discrete frequency is not available, the transmission may be made on the voice channels of the most appropriate terminal navigation aids, preferably a very high frequency omni-directional radio range, provided the range and readability are adequate and the identification of the navigation aid is sequenced with the broadcast so that the very high frequency omni-directional radio range is not obliterated.

(5) The voice-automatic terminal information service broadcasts shall not be transmitted on the voice channel of an instrument landing system.

(6) Whenever a voice-automatic terminal information service is provided, the broadcast shall be continuous and repetitive.

(7) The information contained in the current broadcast shall immediately be made known to the air traffic services units concerned with the provision to aircraft of information relating to approach, landing and take-off, whenever the message has not been prepared by that unit.

(8) The voice-automatic terminal information service broadcasts provided at designated aerodromes for use by international air services shall be available in the English language as a minimum.

(9) Where voice-automatic terminal information service broadcasts are available in more than one language, a discrete channel shall be used for each language.

(10) The voice-automatic terminal information service broadcast message shall, whenever practicable, not exceed 30 seconds, care being taken that the readability of the automatic terminal information service message is not impaired by the speed of the transmission or by the identification signal of a navigation aid used for transmission of automatic terminal information service and the broadcast message shall take into consideration human performance.

65. Data link-automatic terminal information service

(1) Where a data link-automatic terminal information service supplements the existing availability of voice-automatic terminal information service referred to in regulation 64, the information shall be identical in both content and format to the applicable voice-automatic terminal information service broadcast.

(2) The content referred to in subregulation (1), for the purpose of maintaining the same designator, shall be considered identical where real-time meteorological information is included but the data shall remain within the parameters of the significant change criteria.

(3) Voice-automatic terminal information service and data link-automatic terminal information service shall be updated simultaneously where a data link-automatic terminal information service supplements the existing availability of voice-automatic terminal information service and the automatic terminal information service requires updating.

66. Automatic terminal information service for voice or data link

(1) Whenever voice-automatic terminal information service or Data link-automatic terminal information service is provided—

- (a) the information communicated shall relate to a single aerodrome;

- (b) the information communicated shall be updated immediately a significant change occurs;
- (c) the preparation and dissemination of the automatic terminal information service message shall be the responsibility of the air traffic services;
- (d) individual automatic terminal information service messages shall be identified by a designator in the form of a letter of the International Civil Aviation Organisation spelling alphabet and designators assigned to consecutive automatic terminal information service messages shall be in alphabetical order;
- (e) aircraft shall acknowledge receipt of the information upon establishing communication with the ATS unit providing approach control service or the aerodrome control tower, as appropriate;
- (f) the appropriate air traffic services unit shall, when replying to the message in paragraph (e) or, in the case of arriving aircraft, at such other time as may be prescribed by the appropriate ATS authority, provide the aircraft with the current altimeter setting; and
- (g) the meteorological information shall be extracted from the local meteorological routine or special report.

(2) The automatic terminal information service messages shall indicate that the relevant weather information will be given on initial contact with the appropriate ATS unit where rapidly changing meteorological conditions make it inadvisable to include a weather report in the automatic terminal information service.

(3) Where an aircraft concerned acknowledges receipt of information contained in a current automatic terminal information service, that information shall not be included in a directed transmission to the aircraft, with the exception of the altimeter setting, which shall be provided in accordance with subregulation (1) (f).

(4) Where an aircraft acknowledges receipt of an automatic terminal information service that is no longer current, any element of information that needs updating shall be transmitted to the aircraft without delay.

(5) The contents of the automatic terminal information service shall be kept as brief as possible and information additional to that specified in regulations 63, 64 and 65, shall only be included when justified in exceptional circumstances.

67. Automatic terminal information service for arriving and departing aircraft

The automatic terminal information service messages containing both arrival and departure information shall in the order listed contain the—

- (a) name of the aerodrome;
- (b) arrival or departure indicator;
- (c) contract type, if communication is via data link-automatic terminal information service;
- (d) designator;
- (e) time of observation, if appropriate;
- (f) type of approaches to be expected;
- (g) the runways in use and status of arresting system constituting a potential hazard, if any;
- (h) significant runway surface conditions and, if appropriate, braking action;
- (i) holding delay, if appropriate;
- (j) transition level, if applicable;
- (k) other essential operational information;
- (l) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runways in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;

- (m) visibility and when applicable, RVR;
- (n) present weather;
- (o) cloud below 1500m or 5000ft or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- (p) air temperature;
- (q) dew point temperature;
- (r) altimeter settings;
- (s) any available information on significant meteorological phenomena in the approach and climb-out areas including wind shear, and information on recent weather of operational significance;
- (t) trend forecast, when available; and
- (u) specific automatic terminal information service instructions.

68. Automatic terminal information service for arriving aircraft

The automatic terminal information service messages containing arrival information only shall contain the following elements of information in the order listed the —

- (a) name of aerodrome;
- (b) arrival indicator;
- (c) contract type, if communication is via data link-automatic terminal information service;
- (d) designator;
- (e) time of observation, if appropriate;
- (f) type of approaches to be expected;
- (g) main landing runways and status of arresting system constituting a potential hazard, if any;
- (h) significant runway surface conditions and, if appropriate, braking action;

- (i) holding delay, if appropriate;
- (j) transition level, if applicable;
- (k) other essential operational information;
- (l) surface wind direction and speed, including significant variations and, where surface wind sensors related specifically to the sections of runways in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- (m) visibility and, when applicable, RVR;
- (n) present weather;
- (o) cloud below 1500m or 5000ft or below the highest minimum sector altitude, whichever is greater, cumulonimbus, where the sky is obscured, vertical visibility when available;
- (p) air temperature;
- (q) dew point temperature;
- (r) altimeter settings;
- (s) any available information on significant meteorological phenomena in the approach area including wind shear, and information on recent weather of operational significance;
- (t) trend forecast, when available; and
- (u) specific automatic terminal information service instructions.

69. Automatic terminal information service for departing aircraft

Automatic terminal information service messages containing departure information only shall contain the following elements of information in the order listed—

- (a) name of aerodrome;
- (b) departure indicator;
- (c) contract type, if communication is via data link-automatic terminal information service;
- (d) designator;
- (e) time of observation, if appropriate;
- (f) runways to be used for take-off and the status of arresting system constituting a potential hazard, if any;
- (g) significant surface conditions of runways to be used for take-off and, if appropriate, braking action;
- (h) departure delay, if appropriate;
- (i) transition level, if applicable;
- (j) other essential operational information;
- (k) surface wind direction and speed, including significant variations and, where surface wind sensors related specifically to the sections of runways in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- (l) visibility and, when applicable, RVR;
- (m) present weather;
- (n) cloud below 1500m or 5000ft or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- (o) air temperature;
- (p) dew point temperature;

- (q) altimeter settings;
- (r) any available information on significant meteorological phenomena in the climb-out area including wind shear;
- (s) trend forecast, when available; and
- (t) specific automatic terminal information service instructions.

70. VOLMET broadcasts and D-VOLMET service

(1) High frequency or very high frequency VOLMET broadcasts or D-VOLMET service shall be provided by Air Navigation Services Provider, where determined by the Africa and Indian Ocean regional air navigation agreements.

(2) VOLMET broadcasts shall use standard radiotelephony phraseologies.

PART V—ALERTING SERVICE

71. Application of alerting service

(1) ATS units shall provide alerting service—

- (a) for all aircraft provided with air traffic control service;
- (b) in so far as practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic services; and
- (c) to any aircraft known or believed to be the subject of unlawful interference.

(2) The flight information centers or area control centers shall serve as the central point for collecting all information relevant to a state of emergency of an aircraft operating within the flight information region or control area concerned and for forwarding such information to the Entebbe Rescue Coordination Center.

(3) In the event of a state of emergency arising to an aircraft while it is under the control of an aerodrome control tower or approach control unit, such unit shall notify immediately the flight information center or area control center which shall in turn notify the Entebbe Rescue Coordination Center.

(4) The notification referred to in subregulation (3) shall not be required where the nature of the emergency is such that the notification would be unnecessary.

(5) Where the urgency of the situation requires, the aerodrome control tower or approach control unit responsible shall first alert and take other necessary steps to set in motion all appropriate local rescue and emergency organisations which can give the immediate assistance required.

72. Notification of rescue coordination centers

(1) Without prejudice to any other circumstances that may render the notification referred to in regulation 71 advisable, ATS units shall, except as prescribed in regulation 75, notify rescue coordination centers immediately an aircraft is considered to be in a state of emergency in accordance with the—

- (a) uncertainty phase where—
 - (i) no communication has been received from an aircraft within a period of thirty minutes after the time the communication should have been received, or from the time an unsuccessful attempt to establish communication with such aircraft was first made, whichever is the earlier, or
 - (ii) an aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by ATS units, whichever is the later, except when no doubt exists as to the safety of the aircraft and its occupants;

- (b) alert phase where—
 - (i) following the uncertainty phase in paragraph (a), subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft;
 - (ii) an aircraft has been cleared to land and fails to land within five minutes of the estimated time of landing and communication has not been re-established with the aircraft;
 - (iii) information has been received which indicates that the operating efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely;
 - (iv) except where evidence exists that would allay apprehension as to the safety of the aircraft and its occupants; or
 - (v) an aircraft is known or believed to be the subject of unlawful interference;
- (c) distress phase where—
 - (i) following the alert phase in paragraph (b), further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraft is in distress;
 - (ii) the fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safely;
 - (iii) information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely; or

- (iv) information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing, except where there is reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.

(2) The notification shall contain the following information where available, in the order listed —

- (a) INCERFA, ALERFA or DETRESFA, as appropriate to the phase of the emergency;
- (b) agency and person calling;
- (c) nature of the emergency;
- (d) significant information from the flight plan;
- (e) unit which made last contact, time and means used;
- (f) last position report and how determined;
- (g) colour and distinctive marks of aircraft;
- (h) dangerous goods carried as cargo;
- (i) any action taken by reporting office; and
- (j) other pertinent remarks.

(3) The information specified in subregulation (2), which is not available at the time the notification is made to the rescue coordination center, shall be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

(4) In addition to the notification in subregulation (1), the rescue coordination center shall, without delay, be furnished with—

- (a) any useful additional information, especially on the development of the state of emergency through subsequent phases; or
- (b) information that the emergency situation no longer exists.

73. Use of communication facilities

ATS units shall use all available communication facilities to establish and maintain communication with an aircraft in a state of emergency and to request news of the aircraft.

74. Plotting aircraft in state of emergency

(1) When a state of emergency is considered to exist, the flight of the aircraft involved shall be plotted on a chart by the rescue coordination center, in order to determine the probable future position of the aircraft and its maximum range of action from its last known position.

(2) The flights of other aircraft known to be operating in the vicinity of the aircraft involved shall be plotted in order to determine their probable future positions and maximum endurance.

75. Information to operator

(1) Where an area control or a flight information center decides that an aircraft is in the uncertainty or the alert phase, the area control or a flight information center shall, where practicable, advise the operator prior to notifying the rescue coordination center.

(2) All information notified to the rescue coordination center by an area control or flight information center under subregulation (1) shall, whenever practicable, be communicated, without delay, to the operator.

76. Information to aircraft operating in vicinity of an aircraft in state of emergency

(1) Where it has been established by an ATS unit that an aircraft is in a state of emergency, other aircraft known to be in the vicinity of

the aircraft involved shall, except as provided in subregulation (2) be informed of the nature of the emergency as soon as practicable.

(2) Where an ATS unit knows or believes that an aircraft is being subjected to unlawful interference, no reference shall be made in air traffic service air-ground communications to the nature of the emergency unless the unlawful interference has first been referred to in communications from the aircraft involved and there is certainty that such reference will not aggravate the situation.

PART VI—AIR TRAFFIC SERVICES REQUIREMENTS
FOR COMMUNICATIONS

77. Aeronautical mobile service for air-ground communications

(1) Air Navigation Services Provider shall ensure that radiotelephony or data link are used in air-ground communications for ATS purposes.

(2) Where a required communication performance specification has been prescribed by the authority for performance-based communication, ATS units shall, in addition to the requirements specified in subregulation (1), have communication equipment which will enable them to provide ATS in accordance with the prescribed required communication performance specifications.

(3) Recording facilities shall be provided on all the air-ground communication channels where direct pilot-controller two-way radiotelephony or data link communications are used for the provision of air traffic control service.

(4) The recordings of communications channels referred to in subregulation (3) shall be retained for a period of not less than thirty days.

(5) The air-ground communication facilities shall enable two-way communications to take place between the unit providing flight information service and appropriately equipped aircraft flying anywhere within the flight information region.

(6) The air-ground communication facilities for flight information service shall permit direct, rapid, continuous and static-free two-way communications whenever practicable.

(7) The air-ground communication facilities shall enable two-way communications to take place between a unit providing area control service and appropriately equipped aircraft flying anywhere within the control area.

(8) The air-ground communication facilities for area control service shall permit direct, rapid, continuous and static-free two-way communications whenever practicable.

(9) Where air-ground voice communication channels are used for area control service and are operated by air-ground communicators, suitable arrangements shall be made to permit direct pilot-controller voice communications, as and where required.

(10) The air-ground communication facilities shall enable direct, rapid, continuous and static-free two-way communications to take place between the unit providing approach control service and appropriately equipped aircraft under its control.

(11) Where the unit providing approach control service functions as a separate unit, air-ground communications shall be conducted over communication channels provided for its exclusive use.

(12) The air-ground communication facilities shall enable direct, rapid, continuous and static-free two-way communications to take place between an aerodrome control tower and appropriately

equipped aircraft operating at any distance within 45km or 25 NM of the aerodrome concerned.

(13) Separate communication channels shall be provided for the control of traffic operating on the manoeuvring area where conditions warrant.

78. General application of aeronautical fixed service in ground-ground communications

Air Navigation Services Provider shall use direct-speech or data link communications in ground-ground communications for air traffic services purposes.

79. Communications between ATS units within flight information region

(1) A flight information center shall have facilities for communications with the following units providing a service within its area of responsibility—

- (a) the area control center, unless collocated;
- (b) approach control units; and
- (c) aerodrome control towers.

(2) An area control center, in addition to being connected to the flight information center prescribed in subregulation (1), shall have facilities for communications with the following units providing a service within its area of responsibility the—

- (a) approach control units;
- (b) aerodrome control towers; and
- (c) air traffic services reporting offices, where separately established.

(3) An approach control unit, in addition to being connected to the flight information center and the area control center as prescribed

in subregulations (1) and (2) shall have facilities for communications with the associated aerodrome control towers and, where separately established, the associated ATS reporting offices.

(4) An aerodrome control tower, in addition to being connected to the flight information center, the area control center and the approach control unit prescribed in subregulations (1), (2) and (3) shall have facilities for communications with the associated air traffic services reporting office, where separately established.

80. Communications between ATS units and other units within flight information region

(1) A flight information center and an area control center shall have facilities for communications with the following units providing a service within their respective area of responsibility—

- (a) appropriate military units;
- (b) the meteorological office serving the center;
- (c) the aeronautical telecommunications station serving the center;
- (d) appropriate operator's offices;
- (e) the rescue coordination center or, in the absence of such center, any other appropriate emergency service; and
- (f) the international NOTAM office serving the center.

(2) An approach control unit and an aerodrome control tower shall have facilities for communications with the following units providing a service within their respective area of responsibility—

- (a) the appropriate military units;
- (b) the rescue and emergency services;
- (c) the meteorological office serving the unit concerned;

- (d) the aeronautical telecommunications station serving the unit concerned;
- (e) the unit providing apron management service, when separately established.

(3) The communication facilities referred to in subregulations (1)(a) and (2)(a) shall include provisions for rapid and reliable communications between the ATS unit concerned and the military units responsible for control of interception operations within the area of responsibility of the ATS.

81. Description of communication facilities

(1) The communication facilities required in regulations 79, 80 (1)(a) and 80 (2) (a), (b) and (c) shall include provisions for—

- (a) communications by direct speech alone, or in combination with data link communications, where, for the purpose of transfer of control using radar or Automatic Dependent Surveillance-Broadcast, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen seconds; and
- (b) printed communications, when a written record is required; the message transit time for such communications being no longer than five minutes.

(2) The communication facilities in all cases not covered in subregulation (1), shall include provisions for—

- (a) communications by direct speech alone, or in combination with data link communications, where the communications can normally be established within fifteen seconds; and
- (b) printed communications, where a written record is required; the message transit time for the communications shall not be more than five minutes.

(3) The ATS units shall provide suitable facilities for automatic recording in all cases where automatic transfer of data to or from ATS computers is required.

(4) The communication facilities required in accordance with regulations 79 and 80 shall be supplemented, where necessary, by facilities for other forms of visual or audio communications.

(5) The communication facilities required in regulation 80 (2) (a), (b) and (c) shall include provisions for communications by direct speech arranged for conference communications.

(6) The communication facilities required under regulation 80 (2) (d) shall include provisions for communications by direct speech arranged for conference communications, where the communications can normally be established within fifteen seconds.

(7) All facilities for direct-speech or data link communications between ATS units and between ATS units and other units described under regulations 80 (1) and (2) shall be provided with automatic recording.

(8) Recordings of data and communications as required in subregulations (3) and (7) shall be retained for a period of at least thirty days.

82. Communications between flight information regions

(1) Flight information centers and area control centers shall have facilities for communications with all adjacent flight information centers and area control centers.

(2) The communication facilities referred to in subregulation (1) shall in all cases include provisions for messages in a form suitable for retention as a permanent record, and delivery in accordance with transit times specified by the Africa and Indian Ocean Regional Air Navigation Agreements.

(3) Unless otherwise prescribed on the basis of Africa and Indian Ocean Regional Air Navigation Agreements, facilities for communications between area control centers serving contiguous control areas shall, include provisions for direct speech and, where applicable, data link communications, with automatic recording.

(4) For the purpose of transfer of control using radar, ADS-B or Automatic Dependent Surveillance-Contract data, the communications referred to in subregulation (3) shall be established instantaneously and for other purposes the communications shall be established within fifteen seconds.

(5) Where required by agreement between the military authorities and the air navigation services provider, in order to eliminate or reduce the need for interceptions in the event of deviations from assigned track, facilities for communications between adjacent flight information centers or area control centers other than those mentioned in subregulation (3) shall include provisions for direct speech alone, or in combination with data link communications.

(6) The communication facilities referred to in subregulation (5) shall be provided with automatic recording to allow communications to be established within fifteen seconds.

(7) Where conditions are such that it is necessary to clear aircraft into an adjacent control area prior to departure, an approach control unit or aerodrome control tower shall be connected with the area control center serving the adjacent area.

(8) The communication facilities referred to in subregulation (7) shall include provisions for communications by direct speech alone, or in combination with data link communications, with automatic recording.

(9) For the purpose of transfer of control using radar, ADS-B or Automatic Dependent Surveillance-Contract data, the communications referred to in subregulation (8) shall be established instantaneously

and for other purposes the communications shall be established within fifteen seconds.

(10) Suitable facilities for automatic recording shall be provided in all cases where automatic exchange of data between air traffic services computers is required and shall be retained for a period of at least thirty days.

83. Procedures for direct-speech communications

The air navigation services provider shall develop procedures for direct speech communications to permit immediate connections to be made for very urgent calls concerning the safety of aircraft and the interruption, if necessary, of less urgent calls in progress at the time.

84. Communications for control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes

(1) The ATS shall provide aerodrome control service with two-way radiotelephony communication facilities for the control of vehicles on the manoeuvring area, except where communication by a system of visual signals is deemed to be adequate.

(2) Separate communication channels shall be provided for the control of vehicles on the manoeuvring area where conditions warrant.

(3) Automatic recording facilities shall be provided on all separate communication channels provided for the control of vehicles on the manoeuvring area and shall be retained for a period of at least thirty days.

85. Automatic recording of surveillance data

(1) The Air Navigation Services provider shall automatically record surveillance data from primary and secondary radar equipment or other systems, used as an aid to air traffic services, for use in accident and incident investigations, search and rescue, air traffic control and surveillance systems evaluation and training.

(2) Automatic recordings shall be retained for a period of not less than thirty days.

(3) Recordings pertinent to accident and incident investigations shall be retained for longer periods until it is evident that they will no longer be required.

PART VII—AIR TRAFFIC SERVICES REQUIREMENTS
FOR INFORMATION

86. General meteorological information

(1) The meteorological service provider shall supply the ATS units with up-to-date information on existing and forecast meteorological conditions for the performance of their respective functions.

(2) The information referred to in subregulation (1) shall be supplied in such a format and frequency prescribed in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022.

(3) The ATS units shall be supplied with available detailed information on the location, vertical extent, direction and rate of movement of meteorological phenomena in the vicinity of the aerodrome, and particularly in the climb-out and approach areas, which could be hazardous to aircraft operations.

(4) Where computer processed upper air data is made available to ATS units in digital form for use by ATS computers, the contents, format and transmission arrangements shall be as agreed between the meteorological service provider and the appropriate ATS authority.

87. Flight information centers and area control centers

(1) The meteorological service provider shall provide flight information centers and area control centers with meteorological

information as prescribed in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022.

(2) The meteorological information referred to in subregulation (1) shall cover the flight information region or control area and such other areas as may be determined on the basis of Africa and Indian Ocean Regional Air Navigation Agreements.

(3) The meteorological service provider shall provide to the flight information centers and area control centers, current pressure data for setting altimeters, at suitable intervals, for locations specified by the flight information center or area control center concerned.

88. Meteorological information to be provided to units providing approach control service

(1) The meteorological service provider shall supply units providing approach control service for the airspace and the aerodromes with which they are concerned, with meteorological information as prescribed in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022.

(2) The meteorological service provider shall communicate special reports and amendments to forecasts to the units providing approach control service as soon as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast.

(3) Where multiple anemometers are used, the meteorological service provider shall ensure that the indicators to which multiple anemometers are related are clearly marked to identify the runway and section of the runway monitored by each anemometer.

(4) The meteorological service provider shall supply units that provide approach control service with current pressure data for setting altimeters for the locations specified by the unit providing approach control service.

(5) Air Navigation Services Provider shall ensure that the units that provide approach control service for final approach, landing and take-off are equipped with surface wind displays.

(6) The displays referred to in subregulation (5) shall be related to the same locations of observation and be fed from the same sensors as the corresponding displays in the aerodrome control tower and in the meteorological station, where such a station exists.

(7) Air Navigation Services Provider shall provide units that provide approach control service for final approach, landing and take-off at aerodromes where runway visual range values are assessed by instrumental means with displays permitting read-out of the current runway visual range values.

(8) The displays referred to in subregulation (7) shall be related to the same locations of observation and be fed from the same sensors as the corresponding displays in the aerodrome control tower and in the meteorological station, where such a station exists.

(9) Air Navigation Services Provider shall provide units that provide approach control service for final approach, landing and take-off at aerodromes where the height of cloud base is assessed by instrumental means, with displays permitting read-out of the current values of the height of cloud base.

(10) The displays referred to in subregulation (9) shall be related to the same locations of observations and be fed from the same sensors as the corresponding displays in the aerodrome control tower and in the meteorological station, where such a station exists.

(11) The meteorological service provider shall provide units that provide approach control service for final approach, landing and take-off with information on wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach.

89. Meteorological information to be provided to aerodrome control towers

(1) The meteorological service provider shall supply aerodrome control towers with meteorological information as prescribed in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022, for the aerodrome with which they are concerned.

(2) The meteorological service provider shall communicate special reports and amendments to forecasts to the aerodrome control towers as soon as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast.

(3) The meteorological service provider shall provide aerodrome control towers with current pressure data for setting altimeters for the aerodrome concerned.

(4) Air Navigation Services Provider shall provide aerodrome control towers with surface wind displays.

(5) The surface wind displays referred to in subregulation (4) shall be related to the same locations of observation and be fed from the same sensors as the corresponding displays in the meteorological station, where such a station exists.

(6) Where multiple sensors are used, the meteorological service provider shall ensure that the surface wind displays to which multiple sensors are related are clearly marked to identify the runway and section of the runway monitored by each sensor.

(7) Air Navigation Services Provider shall provide aerodrome control towers at aerodromes where runway visual range values are measured by instrumental means with displays permitting read-out of the current runway visual range values.

(8) The displays referred to in subregulation (7) shall be related to the same locations of observation and be fed from the same

sensors as the corresponding displays in the meteorological station, where such a station exists.

(9) Air Navigation Services Provider shall provide aerodrome control towers at aerodromes where the height of cloud base is assessed by instrumental means, with displays permitting read-out of the current values of the height of cloud base.

(10) The displays referred to in subregulation (9) shall be related to the same locations of observations and be fed from the same sensors as the corresponding displays in the meteorological station, where such a station exists.

(11) The meteorological service provider shall provide aerodrome control towers with information on wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach and aircraft on the runway during the landing roll or take-off run.

(12) The meteorological service provider shall provide aerodrome warnings to the aerodrome control towers or other appropriate units.

90. Meteorological information to be provided to communication stations

The meteorological service provider shall supply current meteorological reports and forecasts to communication stations for flight information purposes and a copy of the information shall be forwarded to the flight information center or the area control center.

91. Information on aerodrome conditions and operational status of associated facilities

The Air Navigation Services provider shall keep the aerodrome control towers and units providing approach control service informed of the operationally significant conditions of the movement area, including the existence of temporary hazards, and the operational status of any associated facilities at the aerodromes with which they are concerned.

92. Information on operational status of radio navigation services and visual aids

(1) The Air Navigation Services provider shall keep the ATS units informed of the operational status of radio navigation services and visual aids essential for take-off, departure, approach and landing procedures within their area of responsibility and the radio navigation services and visual aids essential for surface movement.

(2) Information on the operational status and any changes of radio navigation services and visual aids referred to in subregulation (1) shall be received by the appropriate ATS units on a timely basis consistent with the use of the services and aids involved.

93. Information on unmanned free balloons

The operators of unmanned free balloons shall keep the appropriate air traffic services units informed of details of flights of unmanned free balloons in accordance with the provisions of the Civil Aviation (Rules of the Air) Regulations, 2020.

94. Information concerning volcanic activity

(1) The meteorological service provider shall inform the ATS units of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud which could affect airspace used by flights within their area of responsibility.

(2) The meteorological service provider shall provide the area control centers and flight information centers with volcanic ash advisory information issued by the associated VAAC.

95. Information concerning radioactive materials and toxic chemical “clouds”

The meteorological service provider shall inform ATS units of the release into the atmosphere of radioactive materials or toxic chemicals which could affect airspace used by flights within their area of responsibility.

96. Requirements for application for exemption

(1) A person may apply to the authority for an exemption from any provision of these Regulations.

(2) Unless in case of emergency, a person requiring exemptions from any of these Regulations shall apply to the authority in writing, at least sixty days prior to the proposed effective date, stating—

- (a) name and contact address of the applicant including electronic mail and fax if any;
- (b) telephone number;
- (c) a citation of the specific requirement from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of operations to be conducted under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) an explanation of how the exemption would be in the public interest;
- (h) a detailed description of the alternative means by which the applicant will ensure a level of safety equivalent to that established by the regulation in question;
- (i) a safety risk assessment carried out in respect of the exemption applied for;
- (j) if the applicant handles international operations and seeks to operate under the proposed exemption, an indication whether the exemption would contravene any provision of these Regulations; and
- (k) any other information that the authority may require.

(3) Where the applicant seeks emergency processing of an application for exemption, the application shall contain supporting facts and reasons for not filing the application within the time specified in subregulation (2) and satisfactory reason for considering the application an emergency.

(4) The authority may, in writing, refuse an application made under subregulation (3), where in the opinion of the authority, the reasons given for emergency processing are not satisfactory.

(5) The application for exemption shall be accompanied by a fee prescribed by the authority.

97. Review and publication

(1) The authority shall review the application for exemption made under regulation 96 for accuracy and compliance and where the application is satisfactory, the authority shall publish a detailed summary of the application for comments, within a prescribed time, in either—

- (a) the Gazette;
- (b) aeronautical information circular; or
- (c) a daily newspaper with national circulation.

(2) Where application requirements have not been fully complied with, the authority shall request the applicant in writing, to comply prior to publication or making a decision under regulation 98(2).

98. Evaluation of request

(1) Where the application requirements are satisfactory, the authority shall conduct an evaluation of the request to include—

- (a) determination of whether an exemption would be in the public interest;

- (b) a determination, after a technical evaluation of whether the applicant’s proposal would provide a level of safety equivalent to that established by the regulation, although where the authority decides that a technical evaluation of the request would impose a significant burden on the authority’s technical resources, the authority may deny the exemption on that basis;
- (c) a determination of whether a grant of the exemption would contravene these Regulations; and
- (d) a recommendation based on the preceding elements, of whether the request should be granted or denied, and of any conditions or limitations that should be part of the exemption.

(2) The authority shall notify the applicant in writing, the decision to grant or deny the request and publish a detailed summary of its evaluation and decision.

(3) The summary referred to in subregulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(4) Where the request is for emergency relief, the authority shall publish the decision after processing the application.

(5) Where the exemption affects a significant population of the aviation community of Uganda, the authority shall publish the summary in the aeronautical information circular.

PART IX—REVOCATION, SAVINGS AND TRANSITIONAL

99. Revocation of S.I. No. 20 of 2020, savings and transitional

(1) The Civil Aviation (Air Traffic Services) Regulations, 2020 are revoked.

(2) A certificate, authorisation, exemption or any approval granted by the authority under the regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any certificate, authorisation, exemption or any approval under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) (4) Notwithstanding regulation 100, a person granted a certificate, authorisation, exemption or any approval continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the certificate or approval cancelled by the authority.

PART X— OFFENCES AND PENALTIES

100. Contravention of Regulations

A person who contravenes any provision of these Regulations may have his or her certificate or exemption cancelled or suspended.

101. Penalties

A person who contravenes any provision of these Regulations commits an offence and is on conviction liable to a fine not exceeding fifty currency points or imprisonment not exceeding twelve months or both, and in the case of a continuing contravention, a fine not exceeding twenty five currency points for each day or part of day that the contravention continues.

102. Appeal

A person aggrieved by any decision made under these Regulations may, within twenty one days of the decision, appeal against the decision to the Appeals Tribunal.

SCHEDULES
SCHEDULE 1

Regulations 10(1), (3) and 60(2)(b)

AIR TRAFFIC SERVICES AIRSPACE CLASSES — SERVICES PROVIDED AND FLIGHT REQUIREMENTS

| Class | Type of flight | Separation provided | Service provided | Speed limitation* | Radio communication requirement | Subject to an ATC clearance |
|-------|----------------|----------------------------------|--|---|---------------------------------|-----------------------------|
| A | IFR only | All aircraft | Air traffic control service | Not applicable | Continuous two-way | Yes |
| B | IFR | All aircraft | Air traffic control service | Not applicable | Continuous two-way | Yes |
| | VFR | All aircraft | Air traffic control service | Not applicable | Continuous two-way | Yes |
| C | IFR | IFR from IFR IFR from VFR | Air traffic control service | Not applicable | Continuous two-way | Yes |
| | VFR | VFR from IFR | 1) Air traffic control service for separation from IFR 2) VFR/VFR traffic information (and traffic avoidance advice on request) | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | Yes |
| D | IFR | IFR from VFR | Air traffic control service, traffic information about VFR flights (and traffic avoidance advice on request) | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | Yes |
| | VFR | Nil | IFR/VFR and VFR/VFR traffic information (and traffic avoidance advice on request) | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | Yes |

| | | | | | | |
|--|-----|----------------------------------|--|---|--------------------|-----|
| E | IFR | IFR from IFR | Air traffic control service and, as far as practical, traffic information about VFR flight | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | Yes |
| | VFR | Nil | Traffic information as far as practical | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | No | No |
| F | IFR | IFR from IFR as far as practical | Air traffic advisory service; flight information service | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | No |
| | VFR | Nil | Flight information service | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | No | No |
| G | IFR | Nil | Flight information service | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | Continuous two-way | No |
| | VFR | Nil | Flight information service | 250 Kt IAS below 3,050 m (10,000 ft) AMSL | No | No |
| *When the height of the transition altitude is lower than 3 050m (10 000 ft) AMSL, FL 100 should be used in lieu of 10,000ft | | | | | | |

SCHEDULE 2

Regulation 19 (4) and (5)

PRINCIPLES GOVERNING THE IDENTIFICATION OF NAVIGATION

SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES

1. Designators for ATS routes and navigation specifications

(1) The purpose of a system of route designators and navigation specifications applicable to specified ATS route segments, routes or area is to allow both pilots and ATS, taking into account automation requirements—

- (a) to make unambiguous reference to any ATS route without the need to resort to the use of geographical coordinates or other means in order to describe it;
- (b) to relate an ATS route to a specific vertical structure of the airspace, as applicable;
- (c) to indicate a required level of navigation performance accuracy, when operating along an ATS route or within a specified area; and
- (d) to indicate that a route is used primarily or exclusively by certain types of aircraft.

(2) In order to meet this purpose, the designation system shall—

- (a) permit the identification of any ATS route in a simple and unique manner;
- (b) avoid redundancy;
- (c) be usable by both ground and airborne automation systems;
- (d) permit utmost brevity in operational use; and
- (e) provide sufficient possibility of extension to cater for any future requirements without the need for fundamental changes.

(3) Controlled, advisory and uncontrolled ATS routes, with

the exception of standard arrival and departure routes, shall therefore be identified as specified in this Schedule.

2. Composition of designator

(1) The ATS route designator shall consist of a basic designator supplemented, if necessary, by—

- (a) one prefix as prescribed in (6); and subparagraph (7) or paragraph 1(7);
- (b) one additional letter as prescribed in (7).

(2) The number of characters required to compose the designator shall not exceed six characters.

(3) The number of characters required to compose the designator should, whenever possible, be kept to a maximum of five characters.

(4) The basic designator shall consist of one letter of the alphabet followed by a number from 1 to 999.

(5) Selection of the letter shall be made from the following—

- (a) A, B, G, R for routes which form part of the regional networks of ATS routes and are not area navigation routes;
- (b) L, M, N, P for area navigation routes which form part of the regional networks of ATS routes;
- (c) H, J, V, W for routes which do not form part of the regional networks of ATS routes and are not area navigation routes;
- (d) Q, T, Y, Z for area navigation routes which do not form part of the regional networks of ATS routes.

(6) Where applicable, one supplementary letter shall be added as a prefix to the basic designator in accordance with the following—

- (a) K to indicate a low-level route established for use primarily by
- (b) helicopters;
- (c) U to indicate that the route or portion of the route is established in the upper airspace;

- (c) S to indicate a route established exclusively for use by supersonic aircraft during acceleration, deceleration and while in supersonic flight.

(7) Where prescribed by the appropriate air navigation service provider or on the basis of Africa Indian regional air navigation agreements, a supplementary letter may be added after the basic designator of the ATS route in question in order to indicate the type of service provided in accordance with the following—

- (a) the letter F to indicate that on the route or portion of the route advisory service only is provided;
- (b) the letter G to indicate that on the route or portion of the route flight information service only is provided.

Note 1.- Due to limitations in the display equipment on board aircraft, the supplementary letters “F” or “G” may not be displayed to the pilot.

Note 2.- Implementation of a route or a portion of the route as controlled route, advisory route or flight information route is indicated in aeronautical charts and aeronautical information publications in accordance with the provisions in the Civil Aviation (Aeronautical Charts) Regulations, 2022 and AIS Technical Standards.

3. Assignment of basic designators

(1) Basic ATS route designators shall be assigned in accordance with the following principles—

- (a) the same basic designator shall be assigned to a main trunk route throughout its entire length, irrespective of terminal control areas, States or regions traversed;

Note.- This is of particular importance where automated ATS data processing and computerised airborne navigation equipment is used.

- (b) where two or more trunk routes have a common segment, the segment in question shall be assigned each of the designators of the routes concerned, except where this would present

difficulties in the provision of air traffic service, in which case, by common agreement, one designator only shall be assigned;

- (c) a basic designator assigned to one route shall not be assigned to any other route;
- (d) Uganda's requirements for designators shall be notified to the Regional Offices of ICAO for coordination.

4. Use of designators in communications

(1) In printed communications, the designator shall be expressed at all times by not less than two and not more than six characters.

(2) In voice communications, the basic letter of a designator shall be spoken in accordance with the ICAO spelling alphabet.

(3) Where the prefixes K, U or S specified in paragraph 1 (6) are used, they shall, in voice communications, be spoken as follows—

K — KOPTER

U — UPPER

S — SUPERSONIC

where the word “kopter” shall be pronounced as in the word “helicopter” and the words “upper” and “supersonic” as in the English language.

(4) Where the letters “F” or “G” specified in paragraph 1(7) are used, the flight crew shall not be required to use them in voice communications.

SCHEDULE 3

Regulation 19 (6)

PRINCIPLES GOVERNING THE IDENTIFICATION OF STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES

1. Designators for standard departure and arrival routes and associated procedures

Note.— In the following text the term “route” is used in the meaning of “route and associated procedures”.

- (1) The system of designators shall—
 - (a) permit the identification of each route in a simple and unambiguous manner;
 - (b) make a clear distinction between—
 - (i) departure routes and arrival routes;
 - (i) departure or arrival routes and other ATS routes;
 - (iii) routes requiring navigation by reference to ground based radio aids or self-contained airborne aids, and routes requiring navigation by visual reference to the ground;
 - (c) be compatible with ATS and aircraft data processing and display requirements;
 - (d) be of utmost brevity in its operational application;
 - (e) avoid redundancy;
 - (f) provide sufficient possibility for extension to cater for any future requirements without the need for fundamental changes.
- (2) Each route shall be identified by a plain language designator and a corresponding coded designator.
- (3) The designators shall, in voice communications, be easily recognisable as relating to a standard departure or arrival route and shall not create any difficulties in pronunciation for pilots and ATS personnel.

2. Composition of designators

The following apply to composition designators.

- (1) Plain language designator
 - (a) The plain language designator of a standard departure or arrival route shall consist of—
 - (i) a basic indicator; followed by
 - (ii) a validity indicator; followed by
 - (iii) a route indicator, where required; followed by
 - (iv) the word “departure” or “arrival”; followed by
 - (v) the word “visual”, if the route has been established for use by aircraft operating in accordance with the visual flight rules (VFR).
 - (b) The basic indicator shall be the name or name-code of the significant point where a standard departure route terminates or a standard arrival route begins.
 - (c) The validity indicator shall be a number from 1 to 9.
 - (d) The route indicator shall be one letter of the alphabet and the letters “I” and “O” shall not be used.
- (2) Coded designator
 - (a) The coded designator of a standard departure or arrival route, instrument or visual, shall consist of—
 - (b) the coded designator or name-code of the significant point described in subparagraph (1) (a); followed by
 - (c) the validity indicator in subparagraph (1) (b); followed by the route indicator in subparagraph (1) (c), where required.

3. Assignment of designators

- (1) Each route shall be assigned a separate designator.
- (2) To distinguish between two or more routes which relate to the same significant point and therefore are assigned the same basic indicator, a separate route indicator as described in paragraph 2 (1) (d) shall be assigned to each route.

4. Assignment of validity indicators

(1) A validity indicator shall be assigned to each route to identify the route which is currently in effect.

(2) The first validity indicator to be assigned shall be the number “1”.

(3) Whenever a route is amended, a new validity indicator, consisting of the next higher number, shall be assigned and the number “9” shall be followed by the number “1”.

5. Examples of plain language and coded designators

(1) Example 1: Standard departure route — instrument-

- | | |
|-----------------------|------------|
| (a) Plain language | BRECON ONE |
| designator: | DEPARTURE |
| (b) Coded designator: | BCN 1 |

(2) Meaning: The designator identifies a standard instrument departure route which terminates at the significant point BRECON (basic indicator). BRECON is a radio navigation facility with the identification BCN (basic indicator of the coded designator). The validity indicator ONE (1 in the coded designator) signifies either that the original version of the route is still in effect or that a change has been made from the previous version NINE (9) to the now effective version.

ONE (1) (see 4 (3)). The absence of a route indicator (see paragraphs 2 (1) (d) and 3 (2)) signifies that only one route, in this case a departure route, has been established with reference to BRECON.

(3) Example 2: Standard arrival route — instrument—

- | | |
|-----------------------|-----------------|
| (a) Plain language: | KODAP TWO ALPHA |
| designator: | ARRIVAL |
| (b) Coded designator: | KODAP 2 A |

(4) Meaning: This designator identifies a standard instrument arrival route which begins at the significant point KODAP (basic indicator). KODAP is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-letter name-code in accordance with

Schedule 4. The validity indicator TWO (2) signifies that a change has been made from the previous version ONE (1) to the now effective version TWO (2). The route indicator ALPHA (A) identifies one of several routes established with reference to KODAP and is a specific character assigned to this route.

(5) Example 3: Standard departure route — visual:

(a) Plain language: ADOLA FIVE BRAVO

Designator: DEPARTURE VISUAL

(b) Coded designator: ADOLA 5 B

(6) Meaning: This designator identifies a standard departure route for controlled VFR flights which terminates at ADOLA, a significant point not marked by the site of a radio navigation facility. The validity indicator FIVE (5) signifies that a change has been made from the previous version FOUR (4) to the now effective version FIVE (5). The route indicator BRAVO (B) identifies one of several routes established with reference to ADOLA.

6. Composition of designators for MLS/RNAV approach procedures

(1) Plain language designator

(a) the plain language designator of an MLS/RNAV approach procedure shall consist of—

(i) “MLS”; followed by

(ii) a basic indicator; followed by

(iii) a validity indicator; followed by

(iv) a route indicator; followed by

(v) the word “approach”; followed by

(vi) the designator of the runway for which the procedure is designed.

(b) the basic indicator shall be the name or name-code of the significant point where the approach procedure begins.

(c) the validity indicator shall be a number from 1 to 9.

(d) the route indicator shall be one letter of the alphabet. The letters “I” and “O” shall not be used.

- (e) The designator of the runway shall be in accordance with the Civil Aviation (Aerodromes) Regulations, 2022.
- (2) Coded designator
 - (a) The coded designator of an MLS/RNAV approach procedure shall consist of—
 - (b) “MLS”; followed by
 - (c) the coded designator or name-code of the significant point described in paragraph 6 (1)(a)(ii); followed by
 - (d) the validity indicator in paragraph 6 (1)(a)(iii); followed by
 - (e) the route indicator in paragraph 6 (1)(a)(iv); followed by the runway designator in paragraph 6 (1)(a)(vi).
 - (3) Assignment of designators
 - (a) The assignment of designators for MLS/RNAV approach procedures shall be in accordance with paragraph 3 and procedures with identical tracks but different flight profiles shall be assigned separate route indicators.
 - (b) The route indicator letter for MLS/RNAV approach procedures shall be assigned uniquely to all approaches at an airport until all (c) the letters have been used; only then shall the route indicator letter be repeated. The use of the same route indicator for two routes using the same MLS ground facility shall not be permitted.
 - (c) The assignment of validity indicator for approach procedures shall be in accordance with paragraph 4.
 - (4) Example of plain language and coded designators
 - (a) Example:
 - (i) Plain language MLS HAPPY ONE ALPHA
designator: APPROACH RUNWAY ONE
 EIGHT LEFT
 - (ii) Coded designator: MLS HAPPY 1 A 18L
 - (b) Meaning: The designator identifies an MLS/RNAV approach procedure which begins at the significant point HAPPY (basic indicator). HAPPY is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-

letter name-code in accordance with Appendix 2. The validity indicator ONE (1) signifies that either the original version of the route is still in effect or a change has been made from the previous version NINE (9) to the now effective version ONE (1). The route indicator ALPHA (A) identifies one of several routes established with reference to HAPPY and is a specific character assigned to this route.

7. Use of designators in communications

(1) In voice communications, only the plain language designator shall be used.

Note.— For the purpose of identification of routes, the words “departure”, “arrival” and “visual” described in subparagraphs (1)(a)(iv) and (1)(a)(v) are considered to be an integral element of the plain language designator.

(2) In printed or coded communications, only the coded designator shall be used.

8. Display of routes and procedures to air traffic control

(1) A detailed description of each currently effective standard departure or arrival route, or approach procedure, including the plain language designator and the coded designator, shall be displayed at the working positions at which the routes or procedures are assigned to aircraft as part of an ATC clearance, or are otherwise of relevance in the provision of air traffic control services.

(2) Whenever possible, a graphic portrayal of the routes or procedures shall also be displayed.

SCHEDULE 4

Regulation 21 (2)

PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

1. Establishment of significant points

(1) Significant points should, whenever possible, be established with reference to ground-based or space-based radio navigation aids, preferably VHF or higher frequency aids.

(2) Where the ground-based or space-based radio navigation aids do not exist, significant points shall be established at locations which can be determined by self-contained airborne navigation aids, or, where navigation by visual reference to the ground is to be effected, by visual observation. Specific points may be designated as “transfer of control” points by agreement between adjacent air traffic control units or control positions concerned.

2. Designators for significant points marked by the site of a radio navigation aid

(1) Plain language name for significant points marked by the site of a radio navigation aid—

(a) Whenever practicable, significant points shall be named with reference to an identifiable and preferably prominent geographical location.

(b) In selecting a name for the significant point, care shall be taken to ensure that the following conditions are met—

(i) the name shall not create difficulties in pronunciation for pilots or ATS personnel when speaking in the language used in ATS communications. Where the name of a geographical location in the national language selected for designating a significant point gives rise to difficulties in pronunciation, an abbreviated or contracted version of this name, which retains as much of its geographical significance as possible, shall be selected;

Example: FUERSTENFELDBRUCK = FURSTY

- (ii) the name shall be easily recognisable in voice communications and shall be free of ambiguity with those of other significant points in the same general area. In addition, the name shall not create confusion with respect to other communications exchanged between air traffic services and pilots;
- (iii) the name should, if possible, consist of at least six letters and form two syllables and preferably not more than three; and
- (iv) the selected name shall be the same for both the significant point and the radio navigation aid marking it.

(2) Composition of coded designators for significant points marked by the site of a radio navigation aid—

- (a) The coded designator shall be the same as the radio identification of the radio navigation aid and shall be so composed, if possible, as to facilitate association with the name of the point in plain language.
- (b) Coded designators shall not be duplicated within 1 100 km (600 NM) of the location of the radio navigation aid concerned, except as noted in this Schedule.

(3) Uganda's requirements for coded designators shall be notified to the Regional Offices of ICAO for coordination.

3. Designators for significant points not marked by the site of a radio navigation aid

(1) Where a significant point is required at a position not marked by the site of a radio navigation aid, and is used for ATC purposes, it shall be designated by a unique five-letter pronounceable "name-code" and the name- code designator shall then serve as the name as well as the coded designator of the significant point.

(2) The name-code designator shall be selected so as to avoid any difficulties in pronunciation by pilots or ATS personnel when speaking in the language used in ATS communications.

Examples: ADOLA, KODAP

(3) The name-code designator shall be easily recognisable in voice communications and shall be free of ambiguity with those used for other significant points in the same general area.

(4) The unique five-letter pronounceable name-code designator assigned to a significant point shall not be assigned to any other significant point. When there is a need to relocate a significant point, a new name-code designator shall be chosen. In cases where Uganda wishes to keep the allocation of specific name-codes for reuse at a different location, the name-codes shall not be used until after a period of at least six months.

(5) Uganda's requirements for unique five-letter pronounceable name-code designators shall be notified to the Eastern and Southern African Regional Offices of ICAO for coordination.

(6) In areas where no system of fixed routes is established or where the routes followed by aircraft vary depending on operational considerations, significant points shall be determined and reported in terms of World Geodetic System-1984 (WGS-84) geographical coordinates, except that permanently established significant points serving as exit or entry points into such areas shall be designated in accordance with the applicable provisions in paragraphs 2 or 3.

4. Use of designators in communications

(1) Normally the name selected in accordance with paragraphs 2 or 3 shall be used to refer to the significant point in voice communications. If the plain language name for a significant point marked by the site of a radio navigation aid selected in accordance with paragraph 2 (1) is not used, it shall be replaced by the coded designator which, in voice communications, shall be spoken in accordance with the ICAO spelling alphabet.

(2) In printed and coded communications, only the coded designator or the selected name-code shall be used to refer to a significant point.

5. Significant points used for reporting purposes

In order to permit ATS to obtain information regarding the progress of aircraft in flight, selected significant points may need to be designated as reporting points.

(2) In establishing such points, consideration shall be given to the following factors—

- (a) the type of air traffic services provided;
- (b) the amount of traffic normally encountered;
- (c) the accuracy with which aircraft are capable of adhering to the current flight plan;
- (d) the speed of the aircraft;
- (e) the separation minima applied;
- (f) the complexity of the airspace structure;
- (g) the control methods employed;
- (h) the start or end of significant phases of a flight climb, descent, change of direction, etc.;
- (i) transfer of control procedures;
- (j) safety and search and rescue aspects; and
- (k) the cockpit and air-ground communication workload.

(3) Reporting points shall be established either as “compulsory” or as “on-request”.

(4) In establishing “compulsory” reporting points the following principles shall apply—

- (a) compulsory reporting points shall be limited to the minimum necessary for the routine provision of information to air traffic services units on the progress of aircraft in flight, bearing in mind the need to keep cockpit and controller workload and air-ground communications load to a minimum;
- (b) the availability of a radio navigation aid at a location should not necessarily determine its designation as a compulsory reporting point;
- (c) compulsory reporting points should not necessarily be established at flight information region or control area boundaries.

(5) “On-request” reporting points may be established in relation to the requirements of air traffic services for additional position reports when traffic conditions so demand.

(6) The designation of compulsory and on-request reporting points shall be reviewed regularly with a view to keeping the requirements for routine position reporting to the minimum necessary to ensure efficient air traffic services.

(7) Routine reporting over compulsory reporting points should not systematically be made mandatory for all flights in all circumstances and in applying this principle, particular attention shall be given to the following—

- (a) high-speed, high-flying aircraft should not be required to make routine position reports over all reporting points established as compulsory for low-speed, low-flying aircraft;
- (b) aircraft transiting through a terminal control area should not be required to make routine position reports as frequently as arriving and departing aircraft.

(8) In areas where the principles in subparagraph (7) regarding the establishment of reporting points would not be practicable, a reporting system with reference to meridians of longitude or parallels of latitude expressed in whole degrees may be established.

SCHEDULE 5

Regulation 42

INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE

1. Air Navigation Services Provider shall—
 - (a) provide an instrument flight procedure design service;
 - (b) agree with one or more Air Navigation Service providers to provide a joint service; or
 - (c) delegate the provision of the service to external agencies.
2. In all cases in paragraph 1, the Authority shall approve and remain responsible for all instrument flight procedures for aerodromes and airspace under its authority.
3. Instrument flight procedures shall be designed in accordance with design criteria approved by the Authority.
4. The Authority shall ensure that an instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace under its authority meets the requirements established by the relevant regulations.
5. The Authority shall ensure that an instrument flight procedure design service provider utilizes a quality management system at each stage of the instrument flight procedure design process.
6. The Authority shall ensure that maintenance and periodic review of instrument flight procedures for aerodromes and airspace under its authority are conducted.
7. The Authority shall establish an interval for periodic review of instrument flight procedures not exceeding five years.

SCHEDULE 6

Regulation 48

PROCEDURE FOR TRANSFER OF CONTROL

Division of Responsibility for Control Between Air Traffic Control Units

1. General

The appropriate ATS authority shall designate the area of responsibility for each air traffic control unit and, when applicable, for individual control sectors within an air traffic control unit. Where there is more than one air traffic control working position within a unit or sector, the duties and responsibilities of the individual working positions shall be defined.

2. Division between a unit providing aerodrome control service and a unit providing approach control service

Except for flights which are provided aerodrome control service only, the control of arriving and departing controlled flights shall be divided between units providing aerodrome control service and units providing approach control service as follows—

- (a) arriving aircraft. Control of an arriving aircraft shall be transferred from the unit providing approach control service to the unit providing aerodrome control service when the aircraft—
 - (i) is in the vicinity of the aerodrome, and
 - (aa) it is considered that approach and landing will be completed in visual reference to the ground,
 - (ab) has reached uninterrupted visual meteorological conditions,
 - (ii) is at a prescribed point or level, or
 - (iii) has landed, as specified in letters of agreement or ATS unit instructions.
- (b) transfer of communications to the aerodrome controller should be effected at such a point, level or time that clearance to land or alternative instructions, as well as information on essential local traffic, can be issued in a timely manner.

Note.- Even though there is an approach control unit, control of certain flights may be transferred directly from an ACC to an aerodrome control tower and vice versa, by prior arrangement between the units concerned for the relevant part of approach control service to be provided by the ACC or the aerodrome control tower, as applicable.

- (c) Departing aircraft. Control of a departing aircraft shall be transferred from the unit providing aerodrome control service to the unit providing approach control service—
 - (i) where visual meteorological conditions prevail in the vicinity of the aerodrome—
 - (aa) prior to the time the aircraft leaves the vicinity of the aerodrome,
 - (bb) prior to the aircraft entering instrument meteorological conditions, or
 - (cc) when the aircraft is at a prescribed point or level, as specified in letters of agreement or ATS unit instructions;
 - (ii) where instrument meteorological conditions prevail at the aerodrome—
 - (aa) immediately after the aircraft is airborne; or
 - (bb) where the aircraft is at a prescribed point or level, as specified in letters of agreement or local instructions.

Note.- See Note following paragraph 2 (1) (b).

3. Between a unit providing approach control service and a unit providing area control service

(1) When area control service and approach control service are not provided by the same air traffic control unit, responsibility for controlled flights shall rest with the unit providing area control service except that a unit providing approach control service shall be responsible for the control of—

- (a) arriving aircraft that have been released to it by the ACC;
- (b) departing aircraft until such aircraft are released to the ACC.

(2) A unit providing approach control service shall assume control of arriving aircraft, provided the aircraft have been released to it, upon arrival of the aircraft at the point, level or time agreed for transfer of control, and shall maintain control during approach to the aerodrome.

4. Between two units providing area control service

The responsibility for the control of an aircraft shall be transferred from a unit providing area control service in a control area to the unit providing area control service in an adjacent control area at the time of crossing the common control area boundary as estimated by the ACC having control of the aircraft or at such other point, level or time as has been agreed between the two units.

5. Between control sectors or positions within the same air traffic control unit

The responsibility for the control of an aircraft shall be transferred from one control sector or position to another control sector or position within the same ATC unit at a point, level or time, as specified in local instructions.

6. Transfer of control where an ATS surveillance service is being provided

(1) Where an ATS surveillance service is being provided, transfer of control should be effected, whenever practicable, so as to enable the uninterrupted provision of the ATS surveillance service.

(2) Where SSR and or ADS-B or MLAT is used and the display of position indications with associated labels is provided for, transfer of control of aircraft between adjacent control positions or between adjacent ATC units may be effected without prior coordination, provided that—

- (a) updated flight plan information on the aircraft about to be transferred, including the discrete assigned SSR code or, with respect to Mode S and ADS-B, the aircraft identification, is provided to the accepting controller prior to transfer;
- (b) the ATS surveillance system coverage provided to the accepting controller is such that the aircraft concerned is presented on the situation display before the transfer is effected and is identified on, but preferably before, receipt of the initial call;

- (c) when the controllers are not physically adjacent, two-way direct speech facilities, which permit communications to be established instantaneously, are available between them at all times;

Note. — “Instantaneous” refers to communications which effectively provide for immediate access between controllers.

- (d) the transfer point or points and all other conditions of application, such as direction of flight, specified levels, transfer of communication points, and especially an agreed minimum separation between aircraft, including that applicable to succeeding aircraft on the same route, about to be transferred as observed on the situation display, have been made the subject of specific instructions (for intra-unit transfer) or of a specific letter of agreement between two adjacent ATC units;
- (e) the instructions or letter of agreement specify explicitly that the application of this type of transfer of control may be terminated at any time by the accepting controller, normally with an agreed advance notice;
- (f) the accepting controller is informed of any level, speed or vectoring instructions given to the aircraft prior to its transfer and which modify its anticipated flight progress at the point of transfer.

(3) The minimum agreed separation between aircraft about to be transferred as prescribed in paragraph 6 (2) (d) and the advance notice required in paragraph 6 (2) (e) shall be determined taking into account all relevant technical, operational and other circumstances; if circumstances arise in which these agreed conditions can no longer be satisfied, air traffic controllers shall revert to the procedure in paragraph 6 (4) until the situation is resolved.

(4) Where primary radar is being used, and where another type of ATS surveillance system is employed but the provisions of paragraph 6 (2) are not applied, the transfer of control of aircraft between adjacent control positions or between two adjacent ATS units may be effected, provided that—

- (a) identification has been transferred to or has been established directly by the accepting controller;
- (b) when the controllers are not physically adjacent, two-way direct-speech facilities between them are at all-time available which permit communications to be established instantaneously;
- (c) separation from other controlled flights conforms to the minima authorised for use during transfer of control between the sectors or units concerned;
- (d) the accepting controller is informed of any level, speed or vectoring instructions applicable to the aircraft at the point of transfer;
- (e) radio communication with the aircraft is retained by the transferring controller until the accepting controller has agreed to assume responsibility for providing the ATS surveillance service to the aircraft and thereafter, the aircraft should be instructed to change over to the appropriate channel and from that point is the responsibility of the accepting controller.

7. Coordination of transfer

(1) Responsibility for control of an aircraft shall not be transferred from one air traffic control unit to another without the consent of the accepting control unit, which shall be obtained in accordance with this paragraph.

(2) The transferring control unit shall communicate to the accepting control unit the appropriate parts of the current flight plan and any control information pertinent to the transfer requested—

- (a) where transfer of control is to be effected using radar or ADS-B data, the control information pertinent to the transfer shall include information regarding the position and, if required, the track and speed of the aircraft, as observed by radar or ADS-B immediately prior to the transfer.
- (b) where transfer of control is to be effected using ADS-C data, the control information pertinent to the transfer shall include the four dimensional position and other information as necessary.

- (3) The accepting control unit shall—
- (a) indicate its ability to accept control of the aircraft on the terms specified by the transferring control unit, unless by prior agreement between the two units concerned, the absence of any such indication is understood to signify acceptance of the terms specified, or indicate any necessary changes thereto; and
 - (b) specify any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer.

(4) The accepting control unit shall notify the transferring control unit when it has established two-way voice or data link communications with and assumed control of the aircraft concerned, unless otherwise specified by agreement between the two control units concerned.

(5) Applicable coordination procedures, including transfer of control points, shall be specified in letters of agreement and ATS unit instructions as appropriate.

Cross References

Civil Aviation (Aerodromes) Regulations, 2022 S.I. No. 94 of 2022

Civil Aviation (Aeronautical Charts) Regulations, 2022 S.I. No. 68 of 2022

Civil Aviation (Aeronautical Information Services) Regulations, 2022 S.I. No. 71 of 2022

Civil Aviation (Certification of Air Navigation Services) Regulations, 2022 S.I. No. 80 of 2022

Civil Aviation (Fatigue Management) Regulations, 2022 S.I. No. 82 of 2022

Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022 S.I. No. 83 of 2022

Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022 S.I. No. 85 of 2022

Civil Aviation (Operation of Aircraft-Commercial Air Transport Aeroplanes) Regulations, 2022 S.I. No. 84 of 2022

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022 S.I. No. 86 of 2022

Civil Aviation (Personnel Licensing) Regulations, 2022 S.I. No. 89 of 2022

Civil Aviation (Rules of the Air) Regulations, 2020 S.I. No. 15 of 2020

Civil Aviation (Safety Management) Regulations, 2022 S.I. No. 91 of 2022

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S T A T U T O R Y I N S T R U M E N T S

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**THE CIVIL AVIATION (AERONAUTICAL COMMUNICATION
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STATUTORY INSTRUMENTS

2022 No. 70.

The Civil Aviation (Aeronautical Communication Systems)

Regulations, 2022

(Under sections 34(2) (c) and 61 of the Civil Aviation Authority Act, Cap 354)

IN EXERCISE of the powers conferred on the Minister by section 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 11th day of July, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aeronautical Communication Systems) Regulations, 2022.

2. Application

These Regulations apply to a person who provides communication, navigation and surveillance within designated air spaces and at aerodromes.

3. Interpretation

In these Regulations unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“aeronautical administrative communications (AAC)” means communications necessary for the exchange of aeronautical administrative messages;

“aeronautical operational control (AOC)” means communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons;

“aeronautical telecommunication network (ATN)” means a global internet work architecture that allows ground, air-ground and avionic data sub-networks to exchange digital data for the safety of air navigation and for the regular, efficient and economic operation of air traffic services;

“air traffic service” includes flight information service, alerting service, air traffic advisory service and air traffic control service;

“aircraft address” means a unique combination of 24 bits available for assignment to an aircraft for air-ground communications, navigation and surveillance;

“ADCE” means an aircraft specific data circuit-terminating equipment that is associated with an airborne data link processor (ADLP) and operates a protocol unique to Mode S data link for data transfer between air and ground;

“ADLP” means an aircraft-resident processor that is specific to an air-ground data link such as Mode S and which provides channel management, segments or reassembles messages for transfer; is connected to one side of aircraft elements common to all data link systems and on the other side to the air-ground link itself;

“aircraft earth station (AES)” means a mobile earth station in the aeronautical mobile-satellite service located on board an aircraft;

“air-initiated protocol” means a procedure initiated by a Mode S aircraft installation for delivering a standard length or extended length downlink message to the ground;

“Air Navigation Services” means services provided to air traffic during all phases of operations including air traffic management, communication, navigation and surveillance,

meteorological services for air navigation, search and rescue, aeronautical information services and construction of instrument flight procedures;

“air navigation services provider” means an entity responsible for the provision of navigation services;

“ATN end-system” means an ATN host in Internet Protocol Suites;

“ATN host” means an ATN end-system in Open System Interconnection model;

“ATN/IPS” means Aeronautical Telecommunication Network/ Internet Protocol Suite;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;

“automatic dependent surveillance — contract (ADS-C)” means ways by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports;

“automatic dependent surveillance-broadcast (ADS-B)” means ways by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link;

“automatic terminal information service (ATIS)” means the automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion;

“BDS Comm-B data selector” means the 8-bit BDS code that determines the register whose contents are to be transferred in the MB-Comm-B field and is expressed in two groups of 4 bits each, BDS1 (most significant 4 bits) and BDS2 (least significant 4 bits);

“Bit error rate (BER)” means the number of bit errors in a sample divided by the total number of bits in the sample, generally averaged over many such samples;

“broadcast” means—

- (a) a transmission of information relating to air navigation that is not addressed to a specific station or stations; or
- (b) the protocol within the Mode S system that permits uplink messages to be sent to all aircrafts in coverage area and downlink messages to be made available to all interrogators that have the aircraft wishing to send the message under surveillance;

“burst” means a time-defined, contiguous set of one or more related signal units which may convey user information and protocols, signalling, and any necessary preamble;

“capability report” means information identifying whether the transponder has a data link capability as reported in the capability field of an all-call reply or squitter transmission;

“close-out” means a command from a Mode S interrogator that terminates a Mode S link layer communication transaction;

“cluster of interrogators” means two or more interrogators with the same interrogator identifier (II) code, operating cooperatively to ensure that there is no interference to the

required surveillance and data link performance of each of the interrogators, in areas of common coverage;

“coded chip” means a “1” or “0” output of the rate $\frac{1}{2}$ or $\frac{1}{4}$ convolutional code encoder;

“Comm-A” means a 112-bit interrogation containing the 56-bit MA message field and is used by the uplink standard length message (SLM) and broadcast protocols;

“Comm-B” means a 112-bit reply containing the 56-bit MB message field and is used by the downlink SLM, ground-initiated and broadcast protocols;

“Comm-C” means a 112-bit interrogation containing the 80-bit MC message field and is used by the uplink extended length message (ELM) protocol;

“Comm-D” means a 112-bit reply containing the 80-bit MD message field. This field is used by the downlink ELM protocol;

“connection” means a logical association between peer-level entities in a communication system;

“connection establishment delay” means connection establishment delay, as defined in ISO 8348, includes a component, attributable to the called subnetwork (SN) service user, which is the time between the SN-CONNECT indication and the SN-CONNECT response: this user component is due to actions outside the boundaries of the satellite subnetwork and is therefore excluded from the AMS(R)S specifications;

“controller pilot data link communications (CPDLC)” means a means of communication between controller and pilot, using data link for ATC communications;

“COSPAS-SARSAT” means Space System for Search of vessels in distress) – (Search and Rescue Satellite-Aided Tracking);

“data circuit-terminating equipment (DCE)” means a DCE is a network provider equipment used to facilitate communications between DTEs;

“data link capability report” means information in a Comm-B reply identifying the complete Mode S communications capabilities of the aircraft installation;

“data link entity (DLE)” means a protocol State machine capable of setting up and managing a single data link connection;

“data link flight information services (D-FIS)” means the provision of FIS via data link;

“data link service (DLS) sublayer” means the sublayer that resides above the MAC sublayer: for VDL Mode 4, the DLS sublayer resides above the VSS sublayer; the DLS manages the transmit queue, creates and destroys DLEs for connection oriented communications, provides facilities for the LME to manage the DLS, and provides facilities for connectionless communications;

“data link-automatic terminal information service (D-ATIS) means the provision of ATIS via data link;

“data signalling rate” means the passage of information per unit of time and is expressed in bits/second and is given by the formula:

$$\sum_{i=1}^{i=m} \frac{1}{T_i} \log_2 n_i$$

where m is the number of parallel channels, T_i is the minimum interval for the i th channel expressed in

seconds, n_i is the number of significant conditions of the modulation in the i th channel;

“data terminal equipment (DTE)” means an endpoint of a subnetwork connection;

“data transfer delay (95th percentile)” means the 95th percentile of the statistical distribution of delays for which transit delay is the average;

“data transit delay” means in accordance with ISO 8348, the average value of the statistical distribution of data delays: this delay represents the subnetwork delay and does not include the connection establishment delay;

“degree of standardised test distortion” means the degree of distortion of the restitution measured during a specific period of time when the modulation is perfect and corresponds to a specific text;

“designated operational coverage (DOC) area” means the area in which a particular service is provided and in which the service is afforded frequency protection;

“direct link service (DLS)” means a data communications service which makes no attempt to automatically correct errors, detected or undetected, at the link layer of the air-ground communications path;

“doppler shift” means the frequency shift observed at a receiver due to any relative motion between transmitter and receiver;

“downlink ELM (DELM)” means extended length downlink communication by means of 112-bit Mode S Comm-D replies, each containing the 80-bit Comm-D message field (MD);

“downlink” means the transmission of data from an aircraft to the ground: mode S air-to-ground signals are transmitted on the 1 090 MHz reply frequency channel;

“end-to-end” means in relation to an entire communication path, from the interface between the information source and the communication system at the transmitting end to the interface between the communication system and the information user or processor or application at the receiving end;

“end-user” means an ultimate source or consumer of information;

“extended Golay Code” means an error correction code capable of correcting multiple bit errors;

“extended length message (ELM)” means a series of Comm-C interrogations (uplink ELM) transmitted without the requirement for intervening replies, or a series of Comm-D replies (downlink ELM) transmitted without intervening interrogations;

“flight information service (FIS)” means a service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights;

“forward error correction (FEC)” means the process of adding redundant information to the transmitted signal in a manner which allows correction, at the receiver, of errors incurred in the transmission;

“frame” means—

- (a) a link layer frame composed of a sequence of address, control, FCS and information fields: for VDL Mode 2, these fields are bracketed by opening and closing flag sequences, and a frame may or may not include a variable-length information field;

- (b) the basic unit of transfer at the link level;
- (c) in the context of Mode S subnetwork, includes from one to four Comm-A or Comm-B segments, from two to sixteen Comm-C segments, or from one to sixteen Comm-D segments;

“Gaussian filtered frequency shift keying (GFSK)” means a continuous-phase, frequency shift keying technique using two tones and a Gaussian pulse shape filter;

“global signalling channel (GSC)” means a channel available on a worldwide basis which provides for communication control;

“ground data circuit-terminating equipment (GDCE)” means a ground specific data circuit-terminating equipment associated with a ground data link processor (GDLP) and operates a protocol unique to Mode S data link for data transfer between air and ground;

“ground data link processor (GDLP)” means a ground-resident processor that is specific to an air-ground data link (e.g. Mode S), and which provides channel management, and segments or reassembles messages for transfer connected on one side (by means of its DCE) to ground elements common to all data link systems, and on the other side to the air-ground link itself;

“ground earth station (GES)” means an earth station in the fixed satellite service, or, in some cases, in the aeronautical mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the aeronautical mobile satellite service;

“ground-initiated Comm-B (GICB)” means the ground-initiated Comm-B protocol that allows the interrogator to extract

Comm-B replies containing data from a defined source in the MB field;

“HF DL” means high frequency data link;

“HF NPDU” means high frequency network protocol data unit;

“high frequency network protocol data unit” means user data packet;

“link” means a link that connects an aircraft DLE and a ground DLE and is uniquely specified by the combination of aircraft DLS address and the ground DLS address: a different subnetwork entity resides above every link endpoint;

“link layer” means the layer that lies immediately above the physical layer in the open systems interconnection protocol model;

“link management entity (LME)” means a protocol State machine capable of acquiring, establishing and maintaining a connection to a single peer system: the link establishes data link and subnetwork connections, “hands-off” those connections, manages the media access control sublayer and physical layer, and is deleted when communication with the peer system is no longer viable;

“link protocol data unit (LPDU)” means data unit which encapsulates a segment of an HFNPDU;

“low modulation rates” means modulation rates up to and including 300 bauds;

“M burst” means a management channel data block of bits used in VDL Mode 3 and contains signalling information needed for media access and link status monitoring;

- “margin” means the maximum degree of distortion of the circuit at the end of which the apparatus is situated which is compatible with the correct translation of all the signals which it may possibly receive;
- “M-ary phase shift keying (M-PSK) modulation” means a digital phase modulation that causes the phase of the carrier waveform to take on one of a set of M values;
- “media access control (MAC)” means the sublayer that acquires the data path and controls the movement of bits over the data path;
- “media access protocol data unit (MPDU)” means data unit which encapsulates one or more LPDUs;
- “Mode 2” means a data-only VDL mode that uses D8PSK modulation and a carrier sense multiple access (CSMA) control scheme;
- “Mode 3” means a voice and data VDL mode that uses D8PSK modulation and a TDMA media access control scheme;
- “Mode 4” means a data-only VDL mode using a GFSK modulation scheme and self-organizing time division multiple access (STDMA);
- “Mode S packet” means a packet conforming to the Mode S subnetwork standard, designed to minimise the bandwidth required from the air-ground link: ISO 8208 packets may be transformed into Mode S packets and vice-versa;
- “Mode S specific protocol (MSP)” means a protocol that provides restricted datagram service within the Mode S subnetwork;

- “Mode S specific services entity (SSE)” means an entity resident within an XDLP to provide access to the Mode S specific services;
- “Mode S specific services” means a set of communication services provided by the Mode S system which are not available from other air-ground subnetworks, and therefore not interoperable;
- “Mode S subnetwork” means a mode of performing an interchange of digital data using secondary surveillance radar (SSR) Mode S interrogators and transponders in accordance with defined protocols;
- “modulation rate” means the reciprocal of the unit interval measured in seconds and the rate is expressed in bauds;
- “M-PSK symbol” means one of the M possible phase shifts of the M-PSK modulated carrier representing a group of $\log_2 M$ coded chips;
- “optimum sampling point” means the optimum sampling point of a received UAT bit stream is at the nominal centre of each bit period, when the frequency offset is either plus or minus 312.5 kHz;
- “packet” means the basic unit of data transfer among communication devices within the network layer;
- “peak envelope power (PEP)” means the peak power of the modulated signal supplied by the transmitter to the antenna transmission line;
- “physical layer” means the lowest level layer in the open systems interconnection protocol model: the physical layer is concerned with the transmission of binary information over the physical medium such as VHF radio;

- “physical layer protocol data unit (PPDU)” means data unit passed to the physical layer for transmission or decoded by the physical layer after reception;
- “point-to-point” means the interconnection of two devices, particularly end-user instruments: a communication path of service intended to connect two discrete end-users; as distinguished from broadcast or multipoint service;
- “power measurement point (PMP)” means a point at the end of a cable that is attached to an antenna for an antenna to UAT equipment connection: all power measurements are considered as being made at the PMP unless otherwise specified and the cable connecting the UAT equipment to the antenna is assumed to have 3 dB of loss;
- “pseudorandom message data block” means a performance testing requirement for UAT which has statistical properties that are nearly indistinguishable from those of a true random selection of bits for instance each bit should have (nearly) equal probability of being a one or a zero independent of its neighbouring bits: there should be a large number of such pseudorandom message data blocks for each message type (Basic ADS-B, Long ADS-B or Ground Uplink) to provide sufficient independent data for statistical performance measurement;
- “quality of service (QOS)” means the information relating to data transfer characteristics used by various communications protocols to achieve various levels of performance for network users;
- “reed-Solomon code” means an error correction code capable of correcting symbol errors: since symbol errors are collections of bits, these codes provide good burst error correction capabilities;

“reliable link service (RLS)” means a data communications service provided by the subnetwork which automatically provides for error control over its link through error detection and requested retransmission of signal units found to be in error;

“residual error rate” means the ratio of incorrect, lost and duplicate subnetwork service data units (SNSDUs) to the total number of SNSDUs that were sent;

“segment” means a portion of a message that can be accommodated within a single MA/MB field in the case of a standard-length message, or MC/MD field in the case of an extended length message;

“SELCAL” means Selective Calling System;

“self-organizing time division multiple access (STDMA)” means a multiple access scheme based on time-shared use of a radio frequency (RF) channel employing—

- (a) discrete contiguous time slots as the fundamental shared resource; and
- (b) a set of operating protocols that allows users to mediate access to these time slots without reliance on a master control station;

“service volume” means a part of the facility coverage where the facility provides a particular service in accordance with relevant SARPs and within which the facility is afforded frequency protection;

“slot” means one of a series of consecutive time intervals of equal duration: each burst transmission starts at the beginning of a slot;

“squitter protocol data unit (SPDU)” means data packet which is broadcast every 32 seconds by an HF DL ground station on each of its operating frequencies, and which contains link management information;

“standard length message (SLM)” means an exchange of digital data using selectively addressed Comm-A interrogations or Comm-B replies;

“standard UAT receiver” means a general purpose UAT receiver satisfying the minimum rejection requirements of interference from adjacent frequency distance measuring equipment (DME);

“subnetwork” means—

- (a) an implementation of a data network that employs a homogeneous protocol and addressing plan, and is under the control of a single authority; or
- (b) network (N) in ISO 8348 whenever it appears in relation to the sub network layer packet data performance;

“subnetwork service data unit (SNSDU)” means an amount of sub network user data, the identity of which is preserved from one end of a sub network connection to the other;

“subnetwork connection” means a long-term association between an aircraft DTE and a ground DTE using successive virtual calls to maintain context across link handoff;

“subnetwork dependent convergence function (SND CF)” means a function that matches the characteristics and services of a subnetwork to those characteristics and services required by the internetwork facility;

“subnetwork entity” means a packet layer entity as defined in ISO 8208 and includes—

- (a) “ground DCE”: the subnetwork entity in a ground station communicating with an aircraft;
- (b) “ground DTE”: the subnetwork entity in a ground router communicating with an aircraft station; and
- (c) “aircraft DTE”: the subnetwork entity in an aircraft communicating with the station;

“subnetwork layer” means a layer that establishes, manages and terminates connections across a subnetwork;

“subnetwork management entity (SNME)” means an entity resident within a GDLP that performs subnetwork management and communicates with peer entities in intermediate or end-systems;

“successful message reception (SMR)” means the function within the UAT receiver for declaring a received message as valid for passing to an application that uses received UAT messages;

“synchronous operation” means operation in which the time interval between code units is a constant;

“system” means a VDL-capable entity that comprises one or more stations and the associated VDL management entity and may either be an aircraft system or a ground system;

“time division multiple access (TDMA)” means a multiple access scheme based on time-shared use of an RF channel employing—

- (a) discrete contiguous time slots as the fundamental shared resource; and
- (b) a set of operating protocols that allows users to interact with a master control station to mediate access to the channel;

“time division multiplex (TDM)” means a channel sharing strategy in which packets of information from the same source but with different destinations are sequenced in time on the same channel;

“timeout” means the cancellation of a transaction after one of the participating entities has failed to provide a required response within a pre-defined period of time;

“transit delay” means in packet data systems, the elapsed time between a request to transmit an assembled data packet and an indication at the receiving end that the corresponding packet has been received and is ready to be used or forwarded;

“UAT ADS-B message” means a message broadcasted once per second by each aircraft to convey state vector and other information and can be in one of two forms depending on the amount of information to be transmitted in a given second; the Basic UAT ADS-B Message or the Long UAT ADS-B Message: UAT ground stations can support traffic information service-broadcast (TIS-B) through transmission of individual ADS-B messages in the ADS-B segment of the UAT frame;

“UAT ground uplink message” means a message broadcasted by ground stations, within the ground segment of the UAT frame, to convey flight information such as text and graphical weather data, advisories, and other aeronautical

information, to aircraft that are in the service volume of the ground station;

“Universal access transceiver (UAT)” means a broadcast data link operating on 978 MHz, with a modulation rate of 1.041667 Mbps;

“Uplink” means the transmission of data from the ground to an aircraft;

“Uplink ELM (UELM)” means extended length uplink communication by means of 112-bit Mode S Comm-C interrogations, each containing the 80-bit Comm-C message field (MC);

“UTC” means Coordinated Universal Time;

“user group” means a group of ground or aircraft stations which share voice or data connectivity in VDL: for voice communications, all members of a user group can access all communications whereas for data, communications include point-to-point connectivity for air-to-ground messages, and point-to-point and broadcast connectivity for ground-to-air messages;

“VDL” means Very High Frequency Digital Link;

“VDL management entity (VME)” means a VDL-specific entity that provides the quality of service requested by the ATN-defined SN_SME;

“VHF” means Very High Frequency;

“VHF digital link (VDL)” means a constituent mobile subnetwork of the aeronautical telecommunication network (ATN), operating in the aeronautical mobile VHF frequency band;

“vocoder” means a low bit rate voice encoder or decoder;

“voice unit” means device that provides a simplex audio and signalling interface between the user and VDL;

“VSS user” means a user of the VDL Mode 4 specific services;

“XDCE” means ADCE and the GDCE;

“XDLP” means ADLP and the GDLP.

PART II—GENERAL REQUIREMENTS

4. Requirements for communication, navigation and surveillance facility

The installation, commissioning, operation and maintenance of communication, navigation and surveillance facilities shall conform to these Regulations.

5. Certification

A person shall not provide communication, navigation and surveillance services or operate a facility to support air traffic services without an air navigation services provider certificate issued in accordance with the Civil Aviation (Certification of Air Navigation Services) Regulations, 2022.

6. Application for approval

A person who wishes to provide communication, navigation and surveillance systems or to operate communication, navigation and surveillance facility in designated airspace and aerodromes shall apply to the authority for approval.

7. Siting and installation

(1) An Air Navigation Services Provider shall determine the site for installation of a new facility based on operational requirements, construction aspects and maintainability.

(2) A facility referred to in subregulation (1) shall be installed by maintenance personnel who are qualified in the area of

air navigation facilities and who have knowledge of the operations, testing and maintenance of the communication, navigation and surveillance facilities.

8. Installation, operation and maintenance of communication, navigation and surveillance

An Air Navigation Services Provider shall establish procedures to ensure that the communication, navigation and surveillance systems—

- (a) are operated, maintained, available and reliable in accordance with the requirements prescribed by the authority;
- (b) are designed to meet the applicable operational specifications for that facility;
- (c) are installed and commissioned as prescribed by the authority; and
- (d) conform to the applicable system characteristics and specifications.

9. Commissioning of facility

(1) The authority shall be involved in the commissioning of communication, navigation and surveillance facilities to confirm that the facilities meet the standard operating parameters and the requirements of these Regulations before the commencement of operations.

(2) The Air Navigation Services Provider shall establish procedures to ensure that each new facility is commissioned to meet the required specifications for that facility and is in compliance with these Regulations.

(3) The Air Navigation Services Provider shall, at the time of commissioning a facility under subregulation (1), validate the system performance for the new facility by carrying out the necessary tests.

(4) The procedures referred to in subregulation (2), shall include documentation of tests conducted on the facility prior to

commissioning, including those that test the compliance of the facility with the applicable standards and any flight check required in compliance with these Regulations.

10. Inspections and audits

(1) The authority shall carry out safety inspections and audits on communication, navigation and surveillance facilities, and on the documents and records of the communication, navigation and surveillance facilities to determine compliance with these Regulations.

(2) An inspector designated by the authority shall have unrestricted access to the communication, navigation and surveillance facilities, records and documents of a facility approved under these Regulations in order to determine compliance with these Regulations.

11. Availability and reliability

A communication, navigation and surveillance facilities provider shall provide a protected power supply system, battery back-up, reliable connectivity and air conditioning.

12. Test equipment

(1) An Air Navigation Services Provider shall provide the appropriate tools and test equipment for personnel to maintain the operation of equipment.

(2) An Air Navigation Services Provider shall establish a procedure to control, calibrate, and maintain all the equipment.

(3) The maintenance plan or operating and maintenance instructions for each facility shall specify the test equipment requirements for all the levels of operation and maintenance undertaken.

(4) An Air Navigation Services Provider shall use the documented procedures established under subregulation (2), to control, calibrate and maintain test equipment.

13. Record keeping

An Air Navigation Services Provider shall establish procedures to identify, collect, index, store, maintain and dispose of records relating to —

- (a) the performance and maintenance history of a facility;
- (b) the establishment of the periodic test programmes for each facility;
- (c) the test equipment required for the measurement of critical performance parameters;
- (d) a reported or detected facility malfunction;
- (e) the internal quality assurance review; and
- (f) persons authorised to place facilities into operational service.

14. Documentation

An Air Navigation Services Provider shall—

- (a) keep copies of relevant equipment, manuals, technical standards, practices, instructions, maintenance procedures, site logbooks and any other documents that are necessary for the provision and operation of a facility;
- (b) record all occurrences and actions relating to operation, maintenance, modification, failure, faults and removal from and restoration to service in the log books; and
- (c) establish a procedure for the control of the documentation required under this regulation.

15. Periodic inspection and testing

(1) An Air Navigation Services Provider shall establish a procedure for the periodic inspection and testing of the communication, navigation and surveillance systems to verify that each facility meets the performance specifications for that facility.

(2) Periodic inspection referred to in subregulation (1) includes—

- (a) security of the facility and site;
- (b) adherence to the approved maintenance programme;
- (c) upkeep of the equipment, building, site and site services;
and
- (d) adequacy of facility records and documentation.

16. Flight inspection

An Air Navigation Services Provider shall ensure that the radio navigation aids prescribed under these Regulations are available for use by aircraft engaged in air navigation and are subjected to periodic ground and flight inspection.

17. Operation and maintenance plan

(1) An Air Navigation Services Provider shall establish an operation and maintenance plan for the communication, navigation and surveillance facilities to meet the safety requirements prescribed in these Regulations.

(2) The operation and maintenance plan established under subregulation (1) shall provide for the timely and appropriate detection and warning of system failures and degradations.

18. Training requirements for communication, navigation and surveillance personnel

(1) An Air Navigation Services Provider shall ensure that all its personnel possess the skills and competencies required in the provision of the communication navigation and surveillance services.

(2) An Air Navigation Services Provider shall —

- (a) develop a training policy and programme for the organisation;

- (b) maintain training records and plans for the staff; and
- (c) conduct periodic reviews of the training plan.

19. Communication, navigation and surveillance personnel requirements

(1) An Air Navigation Services Provider shall employ a sufficient number of competent personnel to perform the installation, operation and maintenance of communication, navigation and surveillance systems in the designated airspace and aerodromes.

(2) An Air Navigation Services Provider shall provide, in the Manual of Air Navigation Services Operations, an analysis of the personnel required to perform the communication navigation and surveillance services for each facility, taking into account the duties and workload required.

(3) A person shall not perform a function related to the installation, operation or maintenance of any communication, navigation and surveillance system unless —

- (a) that person has successfully completed training in the performance of that function;
- (b) the Air Navigation Services Provider is satisfied that the technical person is competent in performing that function; and
- (c) that the technical person has been certified in accordance with these Regulations.

PART III—AERONAUTICAL TELECOMMUNICATION NETWORK

20. Support of aeronautical telecommunication network application

(1) The aeronautical telecommunication network shall specifically and exclusively be used to provide digital data communications services to air navigation services organisations and operators in support of—

- (a) air traffic services communications with aircraft;
- (b) air traffic services communications between air traffic service units;
- (c) aeronautical operational control communications; and
- (d) aeronautical administrative communications.

(2) The air traffic service communication services referred to in subregulation (1) shall be supported by aeronautical telecommunication network applications.

21. Implementation of aeronautical telecommunication network

(1) The Implementation of the aeronautical telecommunication network shall be based on Afi Regional Air Navigation Agreements.

(2) The aeronautical telecommunication network shall either use the International Organisation for Standardisation communication standards for open systems interconnection or the Internet Society communications standards for the internet protocol suite.

(3) The aeronautical fixed telecommunication network or aeronautical message handling system gateway shall ensure the interoperability of aeronautical fixed telecommunication network stations and networks with the aeronautical telecommunication network.

(4) An authorised path for the aeronautical fixed telecommunication network shall be defined based on a predefined routing policy.

- (5) The aeronautical telecommunication network shall —
 - (a) transmit, relay and deliver messages in accordance with the priority classifications and without discrimination or undue delay;
 - (b) provide means to define data communications that can be carried only over authorised paths for the traffic type and category specified by the user;

- (c) provide communication in accordance with the Technical Guidance Manual on Required Communication Performance Doc 9869;
- (d) operate in accordance with the communication priorities specified in Table 1 and Table 2 of Schedule 1 to these Regulations;
- (e) enable exchange of application information when one or more authorised paths exist;
- (f) notify the appropriate application processes when no authorised path exists;
- (g) make provisions for the efficient use of limited bandwidth sub-networks;
- (h) enable an aircraft intermediate system to connect to a ground intermediate system via different sub-networks;
- (i) enable an aircraft intermediate system to connect to different ground intermediate systems;
- (j) enable the exchange of address information between applications; and
- (k) be accurate to within 1 second of UTC where the absolute time of day is used.

22. Aeronautical telecommunication network applications requirements

(1) The aeronautical telecommunication network shall support the data link initiation capability applications when air-ground data links are implemented.

(2) The aeronautical telecommunication network open system interconnection end-system shall support the following directory services application functions when aeronautical message handling system and security protocols are implemented—

- (a) directory information retrieval; and
- (b) directory information modification.

23. Air-ground applications

The aeronautical telecommunication network shall support one or more of the following applications—

- (a) automatic dependent surveillance-contract;
- (b) controller pilot data link communication; and
- (c) flight information service, including automatic terminal information service and meteorological reports.

24. Ground-ground applications

The aeronautical telecommunication network shall support the following applications—

- (a) air traffic service inter facility data communication; and
- (b) air traffic service message handling services applications.

25. Aeronautical telecommunication network communications service requirements

An aeronautical telecommunication network host shall support the aeronautical telecommunication network or internet protocol suite upper layers, including an application layer.

26. Aeronautical telecommunication network or open system interconnection upper layer communications service

An aeronautical telecommunication network or open system interconnection end-system shall support the open system interconnection upper layer communications service including session, presentation and application layers.

27. Aeronautical telecommunication network or internet protocol suite communications service

(1) An aeronautical telecommunication network host shall support the aeronautical telecommunication network or internet protocol suite including—

- (a) transport layer in accordance with the transmission control protocol and the user data ground protocol; and
- (b) network layer in accordance with internet protocol version 6.

(2) An internet protocol suite router shall support the aeronautical telecommunication network layer in accordance with internet protocol version 6, broader gateway protocol and broader gateway protocol multiprotocol extensions.

28. Aeronautical telecommunication network or open system interconnection communications service

(1) An aeronautical telecommunication network or open system interconnection end-system shall support the aeronautical telecommunication network including—

- (a) the transport layer in accordance with ISO/IEC 8073 (TP4) and optionally ISO/IEC 8602 (CLTP); and
- (b) the network layer in accordance with ISO/IEC 8473 (CLNP).

(2) An ATN intermediate system shall support the aeronautical telecommunication network layer in accordance with ISO/IEC 8473 (CLNP) and ISO/IEC 10747 (IDRP).

29. Aeronautical telecommunication network naming and addressing requirements

(1) The aeronautical telecommunication network shall make provisions for clear application, identification and addressing.

(2) The aeronautical telecommunication network shall provide means to unambiguously address all aeronautical telecommunication network end-systems and intermediate systems.

(3) The aeronautical telecommunication network addressing and naming plans shall allow the authority to assign addresses and names.

30. Aeronautical telecommunication network security requirements

- (1) The aeronautical telecommunication network shall—
- (a) make provisions where only the controlling air traffic services unit within the Air Navigation Services Provider may provide air traffic control instructions to operators in Uganda’s airspace;
 - (b) enable the recipient of a message to identify the originator of that message; and
 - (c) be protected against service attacks to a level consistent with the application service requirements.

(2) Aeronautical telecommunication network end-systems supporting aeronautical telecommunication network security services shall be capable of authenticating the identity of peer end-systems, authenticating the source of messages and ensuring the data integrity of the messages.

PART IV — AERONAUTICAL MOBILE-SATELLITE (ROUTE) SERVICE

31. Aeronautical mobile-satellite (route) service

(1) A mobile-satellite system intended to provide aeronautical mobile-satellite (route) service shall conform to the requirements of these Regulations.

(2) An aeronautical mobile-satellite (route) service system shall support packet data service, voice service or both.

(3) The requirements for mandatory carriage of aeronautical mobile-satellite (route) service system equipment including the level of system capability shall be made on the basis of AFI Regional Air Navigation Agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment and the level of system capability.

(4) Notwithstanding subregulation (3), an operator shall be given at least two years notice to change the mandatory carriage of airborne systems.

(5) The authority shall coordinate with Government ministries, departments and agencies of Government in the implementation aspects of an aeronautical mobile-satellite (route) service system that permit worldwide interoperability and optimum use, as appropriate.

32. RF characteristics

(1) When providing aeronautical mobile-satellite (route) service communications, an aeronautical mobile-satellite (route) service system shall operate only in frequency bands which are appropriately allocated to aeronautical mobile-satellite (route) service and which are protected by the International Telecommunications Union Radio Regulations.

(2) The total emissions of the aircraft earth station necessary to meet designed system performance shall be controlled to avoid harmful interference to other systems necessary to support safety and regularity of air navigation, installed on the same or other aircraft.

(3) Emissions from an aeronautical mobile-satellite (route) service system aircraft earth station shall not cause harmful interference to an aircraft earth station that provides aeronautical mobile-satellite (route) service on a different aircraft.

(4) The aircraft earth station equipment shall operate properly in an interference environment that causes a cumulative relative change in its receiver noise temperature ($\Delta T/T$) of 25 per cent.

33. Priority and pre-emptive access

(1) Every aircraft earth station and ground earth station shall be designed to ensure that messages are transmitted in accordance with the Civil Aviation (Communication Procedures) Regulations, 2022 including their order of priority and are not delayed by the transmission and reception of other types of messages.

(2) The message types not defined in the Civil Aviation (Communication Procedures) Regulations, 2022 shall be terminated even without warning, to allow messages specified in the Civil Aviation (Communication Procedures) Regulations, 2022 to be transmitted and received.

(3) All aeronautical mobile-satellite (route) service data packets and all aeronautical mobile-satellite (route) service voice calls shall be identified as to their associated priority.

(4) The system shall provide voice communications priority over data communications within the same message category.

34. Signal acquisition and tracking

(1) The aircraft earth station, ground earth station and satellites shall acquire and track service link signals when the aircraft is moving at a ground speed of up to 1500 km/h (800 knots) along any heading.

(2) The aircraft earth station, ground earth station and satellites shall acquire and track service link signals when the component of the aircraft acceleration vector in the plane of the satellite orbit is up to 0.6 g.

Performance Requirements

35. Designated operational coverage

An aeronautical mobile-satellite (route) service system shall provide aeronautical mobile-satellite (route) service throughout its designated operational coverage.

36. Failure notification

An aeronautical mobile-satellite (route) service system shall—

- (a) provide timely predictions of the time, location and duration of any resultant outages until full service is restored in the event of a service failure; and
- (b) announce a loss of communications capability within 30 seconds of the time when it detects such a loss.

37. AES requirements

The aircraft earth station shall meet the relevant performance requirements specified in regulations 36 and 39 for aircraft—

- (a) in straight and level flight throughout the designated operational coverage of the satellite system; or
- (b) attitudes of $+20/-5$ degrees of pitch and $+/-25$ degrees of roll throughout the designated operational coverage of the satellite system.

38. Packet data service performance

Where an aeronautical mobile-satellite (route) service system provides packet data service, it shall be capable of operating as a constituent mobile sub network of the aeronautical telecommunication network.

39. Delay parameters

(1) Connection establishment delay of Aeronautical Mobile Satellite (Route) Service (AMS(R) S) systems shall not be greater than 70 seconds.

(2) Data transit delay values shall be based on a fixed sub-network service data unit length of 128 octets in accordance with ISO 8348 and shall be defined as average values.

(3) Data transit delay from aircraft shall not be greater than 40 seconds for the highest priority data service.

(4) Data transit delay from aircraft shall not be greater than 28 seconds for the lowest priority data service.

(5) Data transit delay to aircraft shall not be greater than 12 seconds for the highest priority data service

(6) Data transit delay to aircraft shall not be greater than 28 seconds for the lowest priority data service.

(7) Data transfer delay (95th percentile), shall not be greater than 80 seconds for the highest priority data service.

(8) Data transfer delay (95th percentile) from-aircraft, shall not be greater than 60 seconds for the lowest priority data service.

(9) Data transfer delay (95th percentile) to-aircraft shall not be greater than 15 seconds for the highest priority data service.

(10) Data transfer delay (95th percentile) to-aircraft shall not be greater than 30 seconds for the lowest priority data service.

(11) The connection release delay (95th percentile) shall not be greater than 30 seconds in either direction.

40. Integrity

(1) The residual error rate from-aircraft direction shall not be greater than 10⁻⁴ per sub-network service data unit.

(2) The residual error rate to-aircraft direction shall not be greater than 10⁻⁶ per sub-network service data unit.

(3) The probability of a sub-network connection provider-invoked sub-network connection release shall not be greater than 10⁻⁴ over any one-hour interval.

(4) The probability of a sub-network connection provider-invoked reset shall not be greater than 10⁻¹ over any one-hour interval.

41. Voice service performance

The system that provides aeronautical mobile-satellite (route) service voice service shall meet the requirements in regulations 42, 43 and 44.

42. Call processing delay

(1) The 95th percentile of the time delay for a GES to present a call origination event to the terrestrial network interworking interface after a call origination event has arrived at the AES interface shall not be greater than 20 seconds.

(2) The 95th percentile of the time delay for an AES to present a call origination event at its aircraft interface after a call origination

event has arrived at the terrestrial network interworking interface shall not be greater than 20 seconds.

43. Voice quality

(1) The voice transmission shall provide overall intelligibility performance suitable for the intended operational and ambient noise environment.

(2) The total allowable transfer delay within an aeronautical mobile-satellite (route) service sub-network shall not be greater than 0.485 seconds.

44. Voice capacity

The aeronautical mobile-satellite (route) service system shall have sufficient available voice traffic channel resources to ensure that an aircraft earth station or ground earth station originated aeronautical mobile-satellite (route) service voice call presented to the system experiences a probability of blockage of no more than 10^{-2} .

45. Security

The aeronautical mobile-satellite (route) service system shall provide features for the protection—

- (a) of messages in transit from tampering;
- (b) against denial of service, degraded performance characteristics, or reduction of system capacity when subjected to external attacks; or
- (c) of unauthorised entry.

46. System interfaces

An aeronautical mobile-satellite (route) service system shall allow sub-network users to address aeronautical mobile-satellite (route) service communications to specific aircraft by means of the ICAO twenty four - bit aircraft address.

47. Packet data service interfaces

A system that provides aeronautical mobile-satellite (route) service packet data service shall provide an interface to the aeronautical telecommunication network and a connectivity notification function.

PART V—SECONDARY SURVEILLANCE RADAR MODE S AIR-GROUND DATA LINK

48. Air ground data link communication

The following shall be implemented where air ground data link communication is used by the SSR Mode S —

- (a) the Mode S characteristics shall be as specified in Schedule 2 to these Regulations;
- (b) the DCE and XDCE state tables shall be as specified in Schedule 3 to these Regulations; and
- (c) the Mode S packet formats shall be as specified in Schedule 4 to these Regulations.

PART VI — VERY HIGH FREQUENCY AIR-GROUND DIGITAL LINK (VDL)

49. Radio channels and functional channels

(1) An aircraft station shall be capable of tuning to any of the channels in the range specified in regulation 51 within 100 milliseconds after the receipt of an auto tune command.

(2) An aircraft station for VDL Mode 3, shall be able to tune to any channel in the range specified in regulation 51 within 100 milliseconds after the receipt of any tuning command.

(3) A ground station shall be capable of operating on its assigned channel within the radio frequency range prescribed in this regulation 49.

(4) Frequency 136.975MHz shall be reserved as a worldwide common signalling channel for VHF air-ground digital link Mode 2.

50. System capabilities

(1) The VHF air-ground digital link system shall provide code-independent and byte-independent transfer of data.

(2) The VHF air-ground digital link system shall provide link layer data broadcast services Mode 2 or voice and data broadcast services Mode 3.

(3) The data broadcast service shall support network multicasting capability originating from the ground, for VHF air-ground digital link Mode 3.

(4) The VHF air-ground digital link system shall establish and maintain a reliable communications path between the aircraft and the ground system while allowing but not requiring manual intervention.

(5) A VHF air-ground digital link -equipped aircraft shall transition from one ground station to another when circumstances dictate.

(6) The VHF air-ground digital link Mode 3 system shall support a transparent, simplex voice operation based on a “Listen-Before-Push-To-Talk” channel access.

51. Air-ground VHF digital link communications system characteristics

(1) The radio frequencies used for air-ground VHF digital link communications shall be selected from the radio frequencies in the band 117.975–137 MHz.

(2) The lowest assignable frequency used for Air-ground VHF digital link communications shall be 118.000 MHz, and the highest assignable frequency shall be 136.975 MHz and the separation between assignable frequencies shall be 25 kHz.

(3) The design polarisation of emissions shall be vertical.

52. System characteristics of ground installations for VHF air-ground digital link

The VHF Air ground digital link system characteristics for ground installation shall be as specified in Schedule 5.

53. System characteristics of aircraft installation

The VHF air ground digital link system characteristics for aircraft installation shall be as specified in Schedule 6.

54. Physical layer protocols and services

The VHF air ground digital link systems physical layer protocols and services shall—

- (a) be as specified in Schedule 7 for aircraft and ground stations; and
- (b) be as specified in Schedule 8 for both mobile and ground stations of Mode 4, unless otherwise stated.

55. Link layer protocols and services

The VHF air ground digital link systems link layer protocols and services shall be as specified in Schedule 9.

56. Sub-network layer protocols and services

The VHF air ground digital link systems sub-network layer protocols and services shall be as specified in Schedule 10.

57. VDL mobile sub-network dependent convergence function

(1) The VDL Mode 2 mobile sub network dependent convergence function shall be the standard mobile sub network dependent convergence function.

(2) The VDL Mode 2 mobile sub network dependent convergence function shall—

- (a) support maintaining context across sub network calls;
- (b) use the same context across all switched virtual circuits (SVCs) negotiated to a DTE, when negotiated with the same parameters; or

- (c) support at least two switched virtual circuits (SVCs) sharing a context.

VDL Mode 3

58. VDL Mode 3 sub-network dependent convergence function

The VDL Mode 3 shall support—

- (a) the standard ISO 8208 sub network dependent convergence function as defined in ICAO Doc 9705; and
- (b) the denoted frame-based sub network dependent convergence function.

59. Voice unit for Mode 3 services

(1) The voice unit shall provide for a simplex, “push-to-talk” audio and signalling interface between the user and the VDL and two separate mutually exclusive voice circuit types shall be supported.

(2) The two separate mutually exclusive voice circuit types referred to in subregulation (1) are—

- (a) dedicated circuits; and
- (b) demand assigned circuits.

(3) Dedicated circuits referred to in subregulation (2) (a) shall provide service to a specific user group on an exclusive basis with no sharing of the circuit with other users outside the group and access shall be based on a “listen-before-push-to-talk” discipline.

(4) Demand assigned circuits referred to in subregulation (2) (b) shall provide voice circuit access which is arbitrated by the ground station in response to an access request received from the aircraft station and allow dynamic sharing of the channel resource increasing trunking efficiency.

(5) The voice unit operation shall support a priority override access for authorised ground users.

(6) The voice unit operation shall support notification to the user of the source of a received message.

(7) The voice unit shall support a coded squelch operation that offers some degree of rejection of undesired co-channel voice messages based on the burst time of arrival.

60. Voice unit for Mode 3 speech encoding, parameters and procedures

The VDL Mode 3 shall use the Advanced Multi-Band Excitation 4.8 kbits/s encoding or decoding algorithm, version number AMBE-ATC-10, developed by digital voice systems, incorporated for voice communications.

VDL Mode 4

61. VDL Mode 4 radio channels

(1) A VDL Mode 4 transmitter or receiver shall be capable of tuning to any of the 25 kHz channels from 112 MHz to 137 MHz.

(2) A VDL Mode 4 station shall be capable of receiving two channels simultaneously.

(3) VDL Mode 4 stations shall use two assigned frequencies as global signalling channels, to support user communications and link management functions.

62. VDL Mode 4 system capabilities

(1) The VDL Mode 4 system shall—

- (a) support ATN/IPS-compliant sub network services;
- (b) provide code-independent and byte-independent transfer of data;
- (c) provide link layer broadcast services;
- (d) provide link layer point-to-point services;
- (e) provide air-air communications, without ground support, as well as air-ground communications;

- (f) establish and maintain a reliable communications path between the aircraft and the ground system while allowing, but not requiring, manual intervention when supporting air-ground operations; and
- (g) provide the capability for deriving time from time-of-arrival measurements of received VDL Mode 4 transmissions whenever externally derived estimates of time are unavailable.

(2) A mobile VDL Mode 4 DLS station shall transition from one ground VDL Mode 4 DLS station to another as required.

(3) Mobile and ground VDL Mode 4 stations shall access the physical medium operating in simplex mode.

63. Coordination of channel utilisation

Transmissions shall be scheduled relative to UTC, to ensure efficient use of shared channels and to avoid unintentional slot re-use.

PART VII—AERONAUTICAL FIXED TELECOMMUNICATION NETWORK

64. Characteristics of interregional aeronautical fixed service circuits

Interregional aeronautical fixed service circuits being implemented or upgraded shall employ high quality telecommunications service and the modulation rate shall take into account the traffic volumes expected under both normal and alternate route conditions.

65. Technical provisions relating to international ground-ground data interchange at medium and higher signalling rates

The technical provisions related to international ground-ground data interchange at medium and higher signalling rates for aeronautical fixed telecommunication networks shall be as specified in Schedule 11 to these Regulations.

66. Aircraft addressing system

(1) The aircraft address shall be one of 16 777 214 twenty-four-bit aircraft addresses allocated by the ICAO to the State of Registry or common mark registering authority and assigned as specified in Schedule 12 to these Regulations.

(2) Non-aircraft transponders that are installed on aerodrome surface vehicles, obstacles or fixed Mode S target detection devices for surveillance or radar monitoring purposes shall be assigned 24-bit aircraft addresses.

(3) Mode S transponders used in accordance with subregulation (2) shall not have any negative impact on the performance of existing ATS surveillance systems and ACAS.

PART VIII—POINT-TO-MULTIPOINT COMMUNICATIONS

67. Service via satellite for the dissemination of aeronautical information

Point-to-multipoint telecommunication service via satellite to support the dissemination of aeronautical information shall be based on full-time, non-pre-emptible, protected services as defined in the relevant Telecommunication Standardisation Sector of the International Telecommunications Union Recommendations.

68. Service via satellite for the dissemination of World Area Forecast System products

System characteristics shall include —

- (a) frequency — C-band, earth-to-satellite, 6 GHz band, satellite-to-earth, 4 GHz band;
- (b) capacity with effective signalling rate of not less than 9 600 bits/s;
- (c) bit error rates — better than 1 in 10⁷;
- (d) forward error correction; and
- (e) availability 99.95 per cent.

69. System architecture

The high frequency data link system shall—

- (a) consist of one or more ground and aircraft station subsystems, which implement the high frequency data link protocol specified in regulation 76; and
- (b) include a ground management subsystem specified in regulations 77.

70. Aircraft and ground station subsystems

The high frequency data link aircraft station subsystem and the high frequency data link ground station subsystem shall include the following functions—

- (a) high frequency transmission and reception;
- (b) data modulation and demodulation; and
- (c) high frequency data link protocol implementation and frequency selection.

71. Operational coverage

Frequency assignments for high frequency data link shall be protected throughout their designated operational coverage area.

72. Requirements for carriage of HF DL equipment

(1) Requirements for mandatory carriage of high frequency data link equipment shall be made on the basis of Afi Regional Air Navigation Agreements that specify the airspace of operation and the implementation timescale.

(2) The agreement in subregulation (1) shall provide advance notice of at least two years for the mandatory carriage of airborne systems.

73. Ground station networking

High frequency data link ground station subsystems shall interconnect through a common ground management subsystem.

74. Ground station synchronisation

(1) Synchronisation of high frequency data link ground station subsystems shall be to within ± 25 ms of UTC.

(2) For any station not operating within ± 25 ms of UTC, appropriate notification shall be made to all aircraft and ground station subsystems to allow for continued system operation.

75. Quality of service

(1) The undetected error rate for a network user packet which contains between 1 and 128 octets of user data shall be equal to or less than 1 in 10^6 .

(2) Transit and transfer delays for network user packets of 128 octets shall not exceed the values of the specifications in Table 13-1* in Schedule 13 to these Regulations.

76. HF data link protocol

The high frequency data link protocol shall consist of a physical layer, a link layer, and a sub-network layer, as specified in Schedule 13 to these Regulations.

77. Ground management subsystem

The ground management subsystem shall —

- (a) perform the functions necessary to establish and maintain communications channels between the HF DL ground and aircraft station subsystems; and
- (b) interface with the ground station subsystem in order to exchange control information required for frequency management, system table management, log status management, channel management, and quality of service data collection.

PART X—UNIVERSAL ACCESS TRANSCEIVER (UAT)

78. Universal access transceiver system characteristics of aircraft and ground stations

The universal access transmitter physical layer and system characteristics of aircraft and ground stations shall be as specified in Schedule 14 to these Regulations.

79. Mandatory carriage requirements

Requirements for mandatory carriage of UAT equipment shall be made on the basis of Afi Regional Air Navigation Agreements which specify the airspace of operation and the implementation timescales for the carriage of equipment, including the appropriate lead time.

PART XI — AERONAUTICAL MOBILE SERVICE

80. Air-ground VHF communication system characteristics

(1) The characteristics of the air-ground VHF communication system used in the international aeronautical mobile service shall be in conformity with the specifications contained in Schedule 15.

(2) The systems characteristics for both ground and airborne installation shall conform to the specifications of Schedule 15 to these Regulations.

81. Single side band (SSB) HF communication system characteristics

The characteristics of the air-ground HF single side band system, where used in the aeronautical mobile service, shall be in conformity with the specifications of Schedule 15 to these Regulations.

82. SELCAL system

(1) The system characteristics contained in Schedule 16 to these Regulations shall be applied where a SELCAL system is installed.

(2) Until 2 November, 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have

SELCAL encoders in accordance with the red group specified in the table of tone frequencies in Schedule 16 to these Regulations which may include Red P, Red Q, Red R, and Red S.

(3) As of 3 November 2022, aeronautical stations which are required to communicate with SELCAL-equipped aircraft shall have SELCAL encoders that support all tones in accordance with Table 16-1 of schedule 16.

(4) As of 3 November 2022, SELCAL codes that use tones Red T through Red 9 as given in Table 16-1 of schedule 16 shall only be assigned to SELCAL-equipped aircraft with the capability of receiving these tones.

PART XII—AERONAUTICAL SPEECH CIRCUITS

83. Technical provisions relating to international aeronautical speech circuit switching and signalling for ground-ground applications

(1) The use of circuit switching and signalling to provide speech circuits to interconnect ATS units not interconnected by dedicated circuits shall be by agreement between the authorities concerned.

(2) The application of aeronautical speech circuit switching and signalling shall be based on Afi Regional Air Navigation Agreements.

(3) The Air Traffic Control communication requirements defined in the Civil Aviation (Air Traffic Services) Regulations, 2022 shall be met by implementation of one or more of the following basic three call types—

- (a) instantaneous access;
- (b) direct access; or
- (c) indirect access.

(4) Subject to subregulation (3), the following functions shall be provided in order to meet the requirements specified in the Civil Aviation (Air Traffic Services) Regulations, 2022—

- (a) means of indicating the calling or called party identity;
- (b) means of initiating urgent or priority calls; and
- (c) conference capabilities.

(5) The characteristics of the circuits used in aeronautical speech circuit switching and signalling shall conform to the appropriate ISO/IEC international standards and the Telecommunication Standardisation Sector of the International Telecommunications Union recommendations.

(6) Digital signalling systems shall be used wherever their use can be justified in terms of—

- (a) improved quality of service;
- (b) improved user facilities; or
- (c) reduced costs where quality of service is maintained.

(7) The characteristics of the supervisory tones to be used such as ringing, busy and number unobtainable shall conform to the appropriate Telecommunication Standardisation Sector of the International Telecommunications Union recommendations.

(8) The international aeronautical telephone network numbering scheme shall be used to take advantage of the benefits of interconnecting regional and national aeronautical speech networks.

PART XIII—EMERGENCY LOCATOR TRANSMITTER FOR SEARCH AND RESCUE

84. Operating frequencies

(1) All installations of emergency locator transmitters operating on 406 MHz shall comply with regulation 67.

(2) All installations of emergency locator transmitters operating on 121.5 MHz shall comply with regulation 68.

(3) Emergency locator transmitters shall operate on 406 MHz and 121.5 MHz simultaneously.

(4) All emergency locator transmitters installed on or after 1 January 2002 shall operate simultaneously on 406 MHz and 121.5 MHz.

(5) The technical characteristics for the 406 MHz component of an integrated ELT shall be in accordance with regulation 70.

(6) The technical characteristics for the 121.5 MHz component of an integrated ELT shall be in accordance with regulation 69.

85. Emergency locator transmitters register

(1) The authority shall prepare a 406 MHz emergency locator transmitters register and shall ensure that the register is updated whenever necessary.

(2) The register information regarding the emergency locator transmitters shall be immediately available to search and rescue authorities.

(3) Emergency locator transmitters register information shall include—

- (a) transmitter identification expressed in the form of an alphanumeric code of 15 hexadecimal characters;
- (b) transmitter manufacturer, model and serial number;
- (c) COSPAS-SARSAT type approval number;
- (d) name, address and emergency telephone number of the owner and operator;
- (e) name, address and telephone number of other emergency contacts to whom the owner or the operator is known;

- (f) aircraft manufacturer and type; and
- (g) colour of the aircraft.

86. Specification for the 121.5 MHz component of emergency locator transmitter

(1) Emergency locator transmitters shall operate on 121.5 MHz and the frequency tolerance shall not exceed plus or minus 0.005 per cent.

(2) The emission from an emergency locator transmitter under normal conditions and attitudes of the antenna shall be vertically polarized and essentially omni-directional in the horizontal plane.

(3) Over a period of 48 hours of continuous operation, at an operating temperature of minus 20°C, the peak effective radiated power shall at no time be less than 50 mW.

(4) The type of emission shall be A3X and any other type of modulation that meets the requirements of subregulations (5), (6) and (7) shall be used provided that the emission does not prejudice precise location of the beacon by homing equipment.

(5) The carrier shall be amplitude modulated at a modulation factor of at least 0.85.

(6) The modulation applied to the carrier shall have a minimum duty cycle of 33 percent.

(7) The emission shall have a distinctive audio characteristic achieved by amplitude modulating the carrier with an audio frequency sweeping downward over a range of not less than 700 Hz within the range 1 600 Hz to 300 Hz and with a sweep repetition rate of between 2 Hz and 4 Hz.

(8) The emission shall include a clearly defined carrier frequency distinct from the modulation sideband components; in particular, at least 30 per cent of the power shall be contained at

all times within plus or minus 30 Hz of the carrier frequency on 121.5 MHz.

87. Specification for the 406 MHz component of emergency locator transmitter

(1) Emergency locator transmitters shall operate on one of the frequency channels assigned for use in the frequency band 406.0 to 406.1 MHz.

(2) The period between transmissions shall be 50 seconds, plus or minus 5 percent.

(3) The transmitter power output shall be within the limits of 5 W plus or minus 2 dB over a period of 24 hours of continuous operation at an operating temperature of -20°C .

(4) The 406 MHz emergency locator transmitters shall be capable of transmitting a digital message.

88. Transmitter identification coding

(1) Emergency locator transmitters operating on 406 MHz shall be assigned a unique coding for identification of the transmitter or aircraft on which it is carried.

(2) The emergency locator transmitter shall be coded in accordance with either the aviation user protocol or one of the serialised user protocols specified in Schedule 17 to these Regulations and shall be registered with the authority.

PART XIV—EXEMPTIONS

89. Application for exemption

(1) A person may apply to the authority for an exemption from any provision of these Regulations.

(2) Except in the case of an emergency, an application under subregulation (1) shall be made at least sixty days prior to the proposed effective date, stating the following—

- (a) name and address of applicant;
- (b) telephone contact;
- (c) the specific provision from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of operations to be conducted under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) a detailed description of the alternative means by which the applicant will ensure a level of safety equivalent to that established by the regulation in question;
- (h) a safety risk assessment carried out in respect of the exemption applied for;
- (i) if the applicant handles international operations and seeks to operate under the proposed exemption, an indication whether the exemption would contravene any provision of the Standards and Recommended Practices of the International Civil Aviation Organisation (ICAO); and
- (j) any other information that the authority may require.

(3) The application shall contain evidence and reasons for not filing the application within the time specified in subregulation (2) and reasons for deeming the application an emergency where the applicant seeks emergency processing of an application for exemption.

(4) The authority may, in writing, refuse an application made under subregulation (3), where, in the opinion of the authority, the reasons given for emergency processing are not satisfactory.

(5) The application for exemption shall be accompanied by a fee prescribed by the authority.

90. Review and publication

(1) The authority shall review the application for exemption made under regulation 89 for accuracy and compliance, and if the application is satisfactory, the authority shall publish a detailed summary of the application for comments, within a prescribed time, in either—

- (a) the Gazette;
- (b) an aeronautical information circular; or
- (c) a daily newspaper of wide national circulation.

(2) The authority shall request the applicant, in writing, to comply prior to publication or making a decision, where the application requirements have not been complied with.

(3) Where the request is for emergency relief, the authority shall publish the decision as soon as possible after processing the application.

91. Evaluation of request

(1) Where the application requirements have been satisfied, the authority shall conduct an evaluation of the request taking into account—

- (a) whether an exemption would be in the public interest;
- (b) whether the applicant's proposal would provide a level of safety equivalent to that established by the regulation after taking a technical evaluation, and where the authority decides that a technical evaluation of the request would impose a significant burden on the authority's technical resources, the authority may deny the exemption on that basis;
- (c) whether a grant of the exemption would contravene these Regulations; and

(d) a recommendation based on paragraphs (a), (b) and (c), of whether the request should be granted or denied, and of any conditions or limitations that should be part of the exemption.

(2) The authority shall notify the applicant in writing, of the decision to grant or deny the request and publish a detailed summary of its evaluation and decision in the Gazette.

(3) The summary referred to in subregulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(4) Where the exemption affects a significant population of the aviation community, the authority shall publish the summary in the aeronautical information circular.

PART XV—OFFENCES AND PENALTIES

92. Contravention of Regulations

A person who contravenes any provision of these Regulations may have his or her certificate, licence, approval or authorisation revoked or suspended.

93. Offences and penalties

A person who contravenes any provision of these Regulations commits an offence and is liable, on conviction, to a fine not exceeding twenty-four currency points or imprisonment not exceeding twelve months or both.

PART XVI—REVOCATION, SAVINGS AND TRANSITIONAL

94. Revocation of SI No. 25 of 2020, savings and Transitional

(1) The Civil Aviation (Aeronautical Communication Systems) Regulations, 2020 are revoked.

(2) A licence, certificate, authorisation, exemption or other approval granted by the authority under the Regulations revoked

by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, exemption or other approval under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Notwithstanding regulation 92, a person granted a licence, certificate, authorisation, exemption or other approval continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the licence, certificate, authorisation cancelled by the authority.

SCHEDULES

SCHEDULE 1

Regulation 21(5)(d)

TABLES FOR AERONAUTICAL TELECOMMUNICATIONS NETWORK (ATN) MAPPING

Table 1: Mapping of ATN communication priorities

| <i>Message categories</i> | <i>ATN application</i> | <i>Corresponding protocol priority</i> | |
|--|------------------------|--|-------------------------------|
| | | <i>Transport layer priority</i> | <i>Network layer priority</i> |
| Network/systems management | | 0 | 14 |
| Distress communications | | 1 | 13 |
| Urgent communications | | 2 | 12 |
| High-priority flight safety messages | CPDLC, ADS-C | 3 | 11 |
| Normal-priority flight safety messages | AIDC, ATIS | 4 | 10 |
| Meteorological communications | METAR | 5 | 9 |
| Flight regularity communications | DLIC, ATSMHS | 6 | 8 |
| Aeronautical information service messages | | 7 | 7 |
| Network/systems administration | DIR | 8 | 6 |
| Aeronautical administrative messages | | 9 | 5 |
| <unassigned> | | 10 | 4 |
| Urgent-priority administrative and U.N. Charter communications | | 11 | 3 |
| High-priority administrative and State/Government communications | | 12 | 2 |
| Normal-priority administrative communications | | 13 | 1 |
| Low-priority administrative communications and aeronautical passenger communications | | 14 | 0 |

Note. — The network layer priorities shown in the table apply only to connectionless network priority and do not apply to subnetwork priority.

Table 2. Mapping of ATN network priority to mobile sub-network priority

| <i>Message categories</i> | <i>ATN network layer priority</i> | <i>Corresponding mobile subnetwork priority (see Note 4)</i> | | | | | |
|--|-----------------------------------|--|-------------------|-------------------|-------------------|-------------------|-------------|
| | | <i>AMSS</i> | <i>VDL Mode 2</i> | <i>VDL Mode 3</i> | <i>VDL Mode 4</i> | <i>SSR Mode S</i> | <i>HFDL</i> |
| Network/ systems management | 14 | 14 | see Note 1 | 3 | 14 | high | 14 |
| Distress communications | 13 | 14 | see Note 1 | 2 | 13 | high | 14 |
| Urgent communications | 12 | 14 | see Note 1 | 2 | 12 | high | 14 |
| High-priority flight safety messages | 11 | 11 | see Note 1 | 2 | 11 | high | 11 |
| Normal-priority flight safety messages | 10 | 11 | see Note 1 | 2 | 10 | high | 11 |
| Meteorological communications | 9 | 8 | see Note 1 | 1 | 9 | low | 8 |
| Flight regularity communications | 8 | 7 | see Note 1 | 1 | 8 | low | 7 |
| Aeronautical information service messages | 7 | 6 | see Note 1 | 0 | 7 | low | 6 |
| Network/ systems administration | 6 | 5 | see Note 1 | 0 | 6 | low | 5 |
| Aeronautical administrative messages | 5 | 5 | not allowed | not allowed | not allowed | not allowed | not allowed |
| <unassigned> | 4 | unassigned | unassigned | unassigned | unassigned | unassigned | unassigned |
| Urgent-priority administrative and U.N. Charter communications | 3 | 3 | not allowed | not allowed | not allowed | not allowed | not allowed |

| | | | | | | | |
|--|---|---|-------------|-------------|-------------|-------------|-------------|
| High-priority administrative and State/ Government communications | 2 | 2 | not allowed | not allowed | not allowed | not allowed | not allowed |
| Normal-priority administrative communications | 1 | 1 | not allowed | not allowed | not allowed | not allowed | not allowed |
| Low-priority administrative communications and aeronautical passenger communications | 0 | 0 | not allowed | not allowed | not allowed | not allowed | not allowed |

Note 1. — VDL Mode 2 has no specific subnetwork priority mechanisms.

Note 2. — The AMSS requirements specify mapping of message categories to subnetwork priority without explicitly referencing ATN network layer priority.

Note 3. — The term “not allowed” means that only communications related to safety and regularity of flight are authorised to pass over this subnetwork as defined in the subnetwork requirements.

Note 4.— Only those mobile subnetworks are listed for which subnetwork requirement exist and for which explicit support is provided by the ATN boundary intermediate system (BIS) technical provisions.

SCHEDULE 2

SSR MODE S AIR GROUND DATA LINK

Regulation 48(a)

MODE S CHARACTERISTICS

1. General

Note 1.— Reference ISO document. In this Schedule, the term “ISO 8208” means the ISO Standard “Information technology-Data communications-X.25 Packet Layer Protocol for Data Terminal Equipment, Reference Number ISO/IEC 8208: 1990(E)”.

Note 2.— The overall architecture of the Mode S sub-network is presented in the diagram below.

Note 3.— The processing splits into three different paths. The first consists of the processing of switched virtual circuits (SVCs), the second consists of the processing of Mode S specific services, and the third consists of the processing of sub-network management information. SVCs utilize the reformatting process and the ADCE or GDCE function. Mode S specific services utilize the Mode S specific services entity (SSE) function.

- (1) Message categories.* The Mode S subnetwork shall only carry aeronautical communications classified under categories of flight safety and flight regularity as specified in the Civil Aviation (Communication Procedures) Regulations, 2019.
- (2) Signals in space.* The signal-in-space characteristics of the Mode S subnetwork shall conform to the provisions contained in the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019.
- (3) Code and byte independency.* The Mode S subnetwork shall be capable of code and byte independent transmission of digital data.

- (4) *Data transfer.* Data shall be conveyed over the Mode S data link in segments using either standard length message (SLM) protocols or extended length message (ELM) protocols as defined in the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019.

Note 1.— An SLM segment is the contents of one 56-bit MA or MB field. An ELM segment is the contents of one 80-bit MC or MD field.

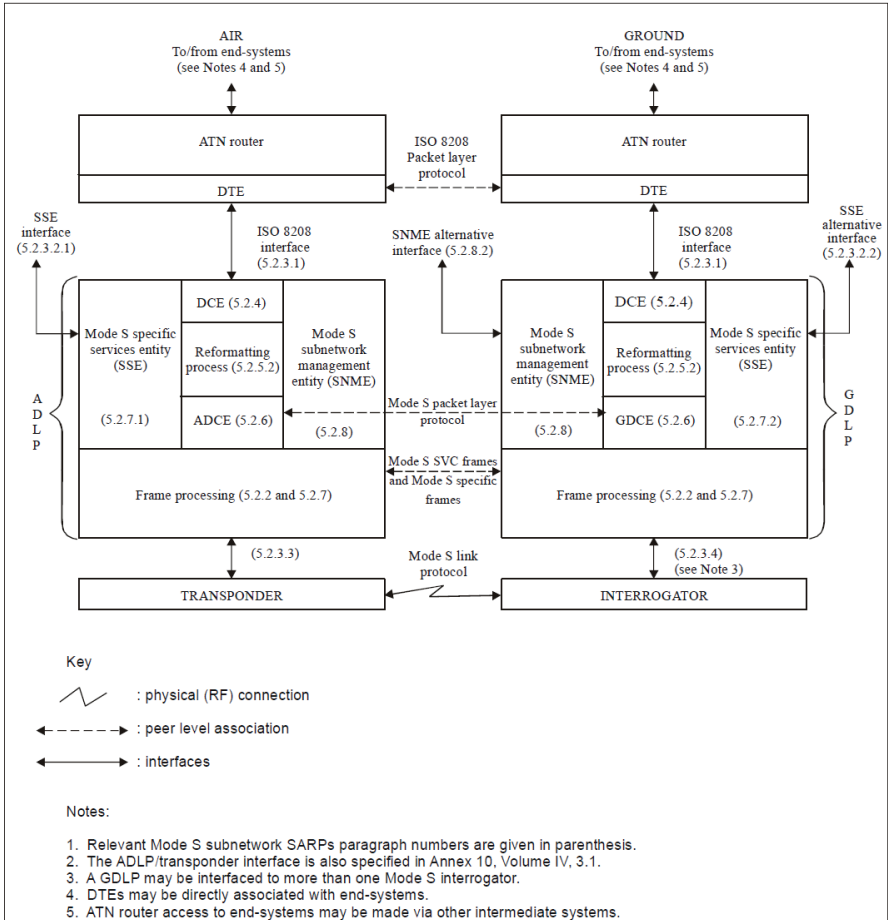
Note 2.— An SLM frame is the contents of up to four linked MA or MB fields. An ELM frame is the contents of 2 to 16 MC or 1 to 16 MD fields.

- (5) *Bit numbering.* In the description of the data exchange fields, the bits shall be numbered in the order of their transmission, beginning with bit 1. Bit numbers shall continue through the second and higher segments of multi-segment frames. Unless otherwise stated, numerical values encoded by groups (fields) of bits shall be encoded using positive binary notation and the first bit transmitted shall be the most significant bit (MSB).
- (6) *Unassigned bits.* When the length of the data is not sufficient to occupy all bit positions within a message field or subfield, the unassigned bit positions shall be set to 0.

2. UPLINK FRAMES

(1) SLM frame. An uplink SLM frame shall be composed of up to four selectively addressed Comm-A segments.

Functional elements of the Mode S subnetwork



Note.— Each Comm-A segment (MA field) received by the ADLP is accompanied by the first 32 bits of the interrogation that delivered the segment. Within these 32 bits is the 16-bit special designator (SD) field.

- (2) *SD field.* When the designator identification (DI) field (bits 14-16) has a code value of 1 or 7, the special designator (SD) field (bits 17-32) of each Comm-A interrogation shall be used to obtain the interrogator identifier subfield (IIS, bits 17-20) and

the linked Comm-A subfield (*LAS*, bits 30-32). The action to be taken shall depend on the value of *LAS*. The contents of *LAS* and IIS shall be retained and shall be associated with the Comm-A message segment for use in assembling the frame as indicated below. All fields other than the *LAS* field shall be as defined in the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019.

(3) *LAS coding*. The 3-bit *LAS* subfield shall be coded as follows—

| LAS | MEANING |
|-----|-----------------------------------|
| 0 | single segment |
| 1 | linked, 1st segment |
| 2 | linked, 2nd but not final segment |
| 3 | linked, 3rd but not final segment |
| 4 | linked, 4th and final segment |
| 5 | linked, 2nd and final segment |
| 6 | linked, 3rd and final segment |
| 7 | unassigned |

(a) *Single segment SLM frame*. If $LAS = 0$, the data in the MA field shall be considered a complete frame and shall be made available for further processing.

(b) *Multiple segment SLM frame*. The ADLP shall accept and assemble linked 56-bit Comm-A segments associated with all sixteen possible interrogator identifier (II) codes. Correct linking of Comm-A segments shall be achieved by requiring that all Comm-A segments have the same value of IIS. If $LAS = 1$ through 6, the frame shall consist of two to four Comm-A segments as follows—

(i) *Initial segment*. If $LAS = 1$, the MA field shall be assembled as the initial segment of an SLM frame. The initial segment shall be stored until all segments of the frame have been received or the frame is cancelled.

(ii) *Intermediate segment*. If $LAS = 2$ or 3, the MA field shall be assembled in numerical order as an intermediate segment of the SLM frame. It shall be

associated with previous segments containing the same value of IIS.

- (iii) Final segment. If $LAS = 4, 5$ or 6 , the MA field shall be assembled as the final segment of the SLM frame. It shall be associated with previous segments containing the same value of IIS.
- (iv) Frame completion. The frame shall be considered complete and shall be made available for further processing as soon as all segments of the frame have been received.
- (v) Frame *cancellation*. An incomplete SLM frame shall be cancelled if one or more of the following conditions apply—
 - (aa) a new initial segment ($LAS = 1$) is received with the same value of IIS; in this case, the new initial segment shall be retained as the initial segment of a new SLM frame;
 - (bb) the sequence of received LAS codes (after the elimination of duplicates) is not contained in the following list—
 - (1) $LAS = 0$
 - (2) $LAS = 1,5$
 - (3) $LAS = 1,2,6$
 - (4) $LAS = 1,6,2$
 - (5) $LAS = 1,2,3,4$
 - (6) $LAS = 1,3,2,4$
 - (7) $LAS = 1,2,4,3$
 - (8) $LAS = 1,3,4,2$
 - (9) $LAS = 1,4,2,3$
 - (10) $LAS = 1,4,3,2$

- (cc) T_c seconds have elapsed since the last Comm-A segment with the same value of IIS was received (see Table 3-1 of Schedule 3).
 - (vi) Segment cancellation. A received segment for an SLM frame shall be discarded if it is an intermediate or final segment and no initial segment has been received with the same value of IIS.
 - (vii) *Segment duplication*. If a received segment duplicates a currently received segment number with the same value of IIS, the new segment shall replace the currently received segment.
- (4) **ELM frame**. An uplink ELM frame shall consist of from 20 to 160 bytes and shall be transferred from the interrogator to the transponder using the protocol defined in the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019. The first 4 bits of each uplink ELM segment (MC field) shall contain the interrogator identifier (II) code of the Mode S interrogator transmitting the ELM. The ADLP shall check the II code of each segment of a completed uplink ELM. If all of the segments contain the same II code, the II code in each segment shall be deleted and the remaining message bits retained as user data for further processing. If all of the segments do not contain the same II code, the entire uplink ELM shall be discarded.

3. Downlink frames

(1) *SLM frame*. A downlink SLM frame shall be composed of up to 4 Comm-B segments. The MB field of the first Comm-B segment of the frame shall contain a 2-bit linked Comm-B subfield (LBS, bits 1 and 2 of the MB field). This subfield shall be used to control linking of up to four Comm-B segments.

- (a) *LBS coding*. Linking shall be indicated by the coding of the LBS subfield of the MB field of the initial Comm-B segment of the SLM frame. The coding of LBS shall be as follows—

| LBS | MEANING |
|-----|--|
| 0 | single segment |
| 1 | initial segment of a two-segment SLM frame |
| 2 | initial segment of a three-segment SLM frame |
| 3 | initial segment of a four-segment SLM frame |

(b) *Linking protocol*

- (i) In the Comm-B protocol, the initial segment shall be transmitted using the air-initiated or multisite directed protocols. The LBS field of the initial segment shall indicate to the ground the number of additional segments to be transferred (if any). Before the transmission of the initial segment to the transponder, the remaining segments of the SLM frame (if any) shall be transferred to the transponder for transmission to the interrogator using the ground-initiated Comm-B protocol. These segments shall be accompanied by control codes that cause the segments to be inserted in ground-initiated Comm-B registers 2, 3 or 4, associated respectively with the second, third, or fourth segment of the frame.
- (ii) Close-out of the air-initiated segment that initiated the protocol shall not be performed until all segments have been successfully transferred.

(c) *Directing SLM frames.* If the SLM frame is to be multisite-directed, the ADLP shall determine the II code of the Mode S interrogator or cluster of interrogators (36 (3)) that shall receive the SLM frame.

(2) *ELM frame*

- (a) *Procedure.* Downlink ELM frames shall be used to deliver messages greater than or equal to 28 bytes and shall be formed using the protocol defined in the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019.
- (b) *Directing ELM frames.* If the ELM frame is to be multisite-directed, the ADLP shall determine the II code of the Mode S interrogator or cluster of interrogators (36 (3)) that shall receive the ELM frame.

4. *XDLP frame processing.*

Frame processing shall be performed on all Mode S packets (except for the MSP packet) as specified in paragraphs 4 to 6 of this Schedule. Frame processing for Mode S specific services shall be performed as specified in paragraph 30 of this Schedule.

(1) *Packet length.* All packets (including a group of packets multiplexed into a single frame) shall be transferred in a frame consisting of the smallest number of segments needed to accommodate the packet. The user data field shall be an integral multiple of bytes in length. A 4-bit parameter (LV) shall be provided in the Mode S DATA, CALL REQUEST, CALL ACCEPT, CLEAR REQUEST and INTERRUPT packet headers so that during unpacking no additional bytes are added to the user data field. The LV field shall define the number of full bytes used in the last segment of a frame. During LV calculations, the 4-bit II code in the last segment of an uplink ELM message shall be—

- (a) ignored for uplink ELM frames with an odd number of Comm-C segments; and
- (b) counted for uplink ELM frames with an even number of Comm-C segments.

The value contained in the LV field shall be ignored if the packet is multiplexed.

(2) *Multiplexing.* When multiplexing multiple Mode S packets into single SLM on ELM frame, the following procedures shall be used. Multiplexing of the packets within the ADLP shall not be applied to packets associated with SVCs of different priorities.

(a) *Multiplexing optimisation*

When multiple packets are awaiting transfer to the same XDLP, they shall be multiplexed into a single frame in order to optimize throughput, provided that packets associated with SVCs of different priorities are not multiplexed together.

- (b) *Structure.* The structure of the multiplexed packets shall be as follows—

| | | | |
|-------------------|--------------|------------------|----------------------------|
| HEADER: 6 or 8 | LENGTH: 8 | 1ST PACKET: v | LENGTH: 8 2ND PACKET: v |
|-------------------|--------------|------------------|----------------------------|

Note. — A number in the field signifies the field length in bits; “v” signifies that the field is of variable length.

- (i) *Multiplexing header.* The header for the multiplexed packets shall be as follows—

| | | | | |
|------|------|------|------|--------------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 |
|------|------|------|------|--------------|

Where,

Data packet type (DP) = 0

MSP packet type (MP) = 1

Supervisory packet (SP) = 3

Supervisory type (ST) = 2

- (ii) *Length.* This field shall contain the length of the following packet in bytes. Any error detected in a multiplexed DATA packet, such as inconsistency between length as indicated in the LENGTH field and the length of the frame hosting that packet, shall result in the discarding of the packet unless the error can be determined to be limited to the LENGTH field, in which case a REJECT packet with the expected PS value can be sent.

For multiplex packets, if the entire packet cannot be de-multiplexed, then the first constituent packet shall be treated as a format error, and the remainder should be discarded.

- (iii) *Termination.* The end of a frame containing a sequence of multiplexed packets shall be determined by one of the following events—

- (aa) a length field of all zeros; or
 - (bb) less than eight bits left in the frame.
- (3) *Mode S channel sequence preservation*
Application. In the event that multiple Mode S frames from the same SVC are awaiting transfer to the same XDLP, the following procedure shall be used—
 - (a) ***SLM frames.*** SLM frames awaiting transfer shall be transmitted in the order received; and
 - (b) ***ELM frames.*** ELM frames awaiting transfer shall be transmitted in the order received.

5. **GDLP frame processing**

- (1) *General*
 - (a) The GDLP shall determine the data link capability of the ADLP/transponder installation from the data link capability report before performing any data link activity with that ADLP.
 - (b) GDLP frame processing shall provide to the interrogator all data for the uplink transmission that are not provided directly by the interrogator.
- (2) *Delivery status.* GDLP frame processing shall accept an indication from the interrogator function that a specified uplink frame that was previously transferred to the interrogator has been successfully delivered over the ground-to air link.
- (3) *Aircraft address.* *GDLP frame processing* shall receive from the interrogator along with the data in each downlink SLM or ELM frame, the 24-bit address of the aircraft that transmitted the frame. GDLP frame processing shall be capable of transferring to the interrogator the 24-bit address of the aircraft that is to receive an uplink SLM or ELM frame.
- (4) *Mode S protocol type identification.* *GDLP* frame processing shall indicate to the interrogator the protocol to be used to transfer the frame: standard length message protocol, extended length message protocol or broadcast protocol.

- (5) *Frame determination.* A Mode S packet (including multiplexed packets but excluding MSP packets) intended for uplink and less than or equal to 28 bytes shall be sent as an SLM frame. A Mode S packet greater than 28 bytes shall be sent as an uplink ELM frame for transponders with ELM capability, using M-bit processing as necessary). If the transponder does not have ELM capability, packets greater than 28 bytes shall be sent using the M-bit or S-bit assembly procedures as necessary and multiple SLM frames.

6. ADLP frame processing

- (1) *General.* With the possible exception of the last 24 bits (address/parity), ADLP frame processing shall accept from the transponder the entire content of both 56-bit and 112-bit received uplink transmissions, excluding all call and ACAS interrogations. ADLP frame processing shall provide to the transponder all data for the downlink transmission that is not provided directly by the transponder.
- (2) *Delivery status.* ADLP frame processing shall accept an indication from the transponder that a specified downlink frame that was previously transferred to the transponder has been closed out.
- (3) *Interrogator identifier.* ADLP frame processing shall accept from the transponder, along with the data in each uplink SLM and ELM, the interrogator identifier (II) code of the interrogator that transmitted the frame. ADLP frame processing shall transfer to the transponder the II code of the interrogator or cluster of interrogators that shall receive a multisite-directed frame.
- (4) *Mode S protocol type identification.* ADLP frame processing shall indicate to the transponder the protocol to be used to transfer the frame: ground-initiated, air-initiated, broadcast, multisite-directed, standard length or extended length.
- (5) *Frame cancellation.* ADLP frame processing shall be capable of cancelling downlink frames previously transferred to the

transponder for transmission but for which a close-out has not been indicated. If more than one frame is stored within the transponder, the cancellation procedure shall be capable of cancelling the stored frames selectively.

- (6) *Frame determination.* A Mode S packet (including multiplexed packets but excluding MSP packets) intended for downlink and less than or equal to 222 bits shall be sent as an SLM frame. A Mode S packet greater than 222 bits shall be sent as a downlink ELM frame for transponders with ELM capability using M-bit processing as necessary. When M-bit processing is used, all ELM frames containing $M = 1$ shall contain the maximum number of ELM segments that the transponder is capable of transmitting in response to one requesting interrogation ($UF = 24$). If the transponder does not have ELM capability, packets greater than 222 bits shall be sent using the M-bit or S-bit assembly procedures and multiple SLM frames.

7. **Priority management**

- (1) *ADLP priority management.* Frames shall be transferred from the ADLP to the transponder in the following order of priority (highest first)—
 - (a) Mode S specific services;
 - (b) search requests;
 - (c) frames containing only high priority SVC packets; and
 - (d) frames containing only low priority SVC packets.
- (2) *GDLP priority management:* Uplink frames shall be transferred in the following order of priority (highest first)—
 - (a) Mode S specific services;
 - (b) frames containing at least one Mode S ROUTE packet;
 - (c) frames containing at least one high priority SVC packet; and
 - (d) frames containing only low priority SVC packets.

8. The DTE ISO 8208 data exchange interface

- (1) *General.* The interface between the XDLP and the DTE(s) shall conform to ISO 8208 packet layer protocol (PLP). The XDLP shall support the procedures of the DTE as specified in ISO 8208. As such, the XDLP shall contain a DCE.
- (2) Physical and link layer requirements for the DTE/DCE interface shall—
 - (a) be code and byte independent and shall not impose restrictions on the sequence, order, or pattern of the bits transferred within a packet; and
 - (b) support the transfer of variable length network layer packets.
- (3) DTE address
 - (a) *Ground DTE address.* The ground DTE address shall have a total length of 3 binary coded decimal (BCD) digits, as follows— $X_0X_1X_2$

X_0 shall be the most significant digit. Ground DTE addresses shall be decimal numbers in the range of 0 through 255 coded in BCD. Assignment of the DTE address shall be a local issue. All DTEs connected to GDLPs having overlapping coverage shall have unique addresses. GDLPs which have a flying time less than T_r (see Table 3-1 of Schedule 3) between their coverage areas shall be regarded as having overlapping coverage.
 - (b) *Mobile DTE address.* The mobile DTE address shall have a total length of 10 BCD digits, as follows— $X_0X_1X_2X_3X_4X_5X_6X_7X_8X_9$

X_0 shall be the most significant digit. The digits X_0 to X_7 shall contain the octal representation of the aircraft address coded in BCD. The digits X_8X_9 shall identify a sub-address for specific DTEs on board an aircraft. This sub-address shall be a decimal number in the range

of 0 and 15 coded in BCD. The following sub-address assignments shall be used—

- (i) 00----ATN router;
 - (ii) 01 to 15----Unassigned.
- (c) *Illegal DTE addresses.* DTE addresses outside of the defined ranges or not conforming to the formats for the ground and mobile DTE addresses specified in paragraph (a) and (b) shall be defined to be illegal DTE addresses. The detection of an illegal DTE address in a CALL REQUEST packet shall lead to a rejection of the call as specified in paragraph 19(5) of this Schedule.
- (d) *Packet layer protocol requirements of the DTE/DCE interface*
- (i) Capabilities. The interface between the DTE and the DCE shall conform to ISO 8208 with the following capabilities—
 - (aa) expedited data delivery, that is the use of INTERRUPT packets with a user data field of up to 32 bytes;
 - (bb) priority facility (with two levels, see paragraph 19(1)(a)(vi));
 - (cc) fast select (see paragraph 19(1)(a)(xiii) and 19(1)(a)(xvi)); and
 - (dd) called/calling address extension facility, if required by local conditions (the XDLP is connected to the DTE via a network protocol that is unable to contain the Mode S address as defined). Other ISO 8208 facilities and the D-bit and the Q-bit shall not be invoked for transfer over the Mode S packet layer protocol.
 - (ii) Parameter values. The timer and counter parameters for the DTE/DCE interface shall conform to the default ISO 8208 values.

9. Mode S specific services data exchange interface

(1) ADLP

- (a) General provisions. The ADLP shall support the accessing of Mode S specific services through the provision of one or more separate ADLP interfaces for this purpose.
- (b) Functional capability. Message and control coding via this interface shall support all of the capabilities specified in paragraph 31.

(2) GDLP

- (a) *General.* The GDLP shall support the accessing of Mode S specific services through the provision of a separate GDLP interface for this purpose and/or by providing access to these services through the DTE/DCE interface.
- (b) *Functional capability.* Message and control coding via this interface shall support all of the capabilities specified in paragraph 32.

10. ADLP/transponder data exchange interface

(1) *Transponder to ADLP*

- (a) The ADLP shall accept an indication of protocol type from the transponder in connection with data transferred from the transponder to the ADLP. This shall include the following types of protocols—
 - (i) surveillance interrogation;
 - (ii) Comm-A interrogation;
 - (iii) Comm-A broadcast interrogation; and
 - (iv) uplink ELM.

The ADLP shall also accept the II code of the interrogator used to transmit the surveillance, Comm-A or uplink ELM.

Note. — *Transponders will not output all-call and ACAS information on this interface.*

- (b) The ADLP shall accept control information from the transponder indicating the status of downlink transfers including—
 - (a) Comm-B close-out;
 - (b) Comm-B broadcast timeout; and
 - (c) downlink ELM close-out.

 - (c) The ADLP shall have access to current information defining the communication capability of the Mode S transponder with which it is operating. This information shall be used to generate the data link capability report (see paragraph 39).
- (2) ADLP to transponder
- (a) The ADLP shall provide an indication of protocol type to the transponder in connection with data transferred from the ADLP to the transponder and this shall include the following types of protocols—
 - (a) ground-initiated Comm-B;
 - (b) air-initiated Comm-B;
 - (c) multisite-directed Comm-B;
 - (d) Comm-B broadcast;
 - (e) downlink ELM; and
 - (f) Multisite-directed downlink ELM.

The ADLP shall also provide the II code for transfer of a multisite-directed Comm-B or downlink ELM and the Comm-B data selector (BDS) code (Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2019) for a ground-initiated Comm-B.

- (b) The ADLP shall be able to perform frame cancellation as specified in paragraph 6(5).

11. **GDLP/Mode S interrogator data exchange interface**

- (1) Interrogator to GDLP
 - (a) The GDLP shall accept an indication of protocol type from the interrogator in connection with data transferred from the interrogator to the GDLP and this shall include the following types of protocols—
 - (i) ground-initiated Comm-B;
 - (ii) air-initiated Comm-B;
 - (iii) air-initiated Comm-B broadcast; and
 - (iv) downlink ELM.
 - (b) The GDLP shall accept the BDS code used to identify the ground-initiated Comm-B segment.
 - (c) The GDLP shall accept control information from the interrogator indicating the status of uplink transfers and the status of the addressed Mode S aircraft.
- (2) GDLP to interrogator. The GDLP shall provide an indication of protocol type to the interrogator in connection with data transferred from the GDLP to the interrogator and this shall include the following types of protocols—
 - (a) Comm-A interrogation;
 - (b) Comm-A broadcast interrogation;
 - (c) uplink ELM; and
 - (d) ground-initiated Comm-B request.

The GDLP shall also provide the BDS code for the ground-initiated Comm-B protocol.

12. **State transitions of a DCE operations.** The DCE shall operate as a State machine. Upon entering a State, the DCE shall perform the actions specified in Table 3-2 of Schedule 3. State transitions and additional actions shall be as specified in Table 3-3 through Table 3-12 of Schedule 3.

13. Disposition of packets of a DCE operation

- (1) Upon receipt of a packet from the DTE, the packet shall be forwarded or not forwarded to the XDCE (via the reformatting process) according to the parenthetical instructions contained in Tables 3-3 to 3-8 of Schedule 3. If no parenthetical instruction is listed or if the parenthetical instruction indicates “do not forward”, the packet shall be discarded.
- (2) Upon receipt of a packet from the XDCE (via the reformatting process), the packet shall be forwarded or not forwarded to the DTE according to the parenthetical instructions contained in Tables 3-7 to 3-10 of Schedule 3. If no parenthetical instruction is listed or if the parenthetical instruction indicates “do not forward”, the packet shall be discarded.

14. Buffer requirements of Mode S packet layer processing

- (1) *ADLP buffer requirements*
 - (a) The following requirements apply to the entire ADLP and shall be interpreted as necessary for each of the main processes (DCE, reformatting, ADCE, frame processing and SSE).
 - (b) The ADLP shall be capable of maintaining sufficient buffer space for fifteen SVCs—
 - (i) to hold fifteen Mode S subnetwork packets of 152 bytes each in the uplink direction per SVC for a transponder with uplink ELM capability or 28 bytes otherwise;
 - (ii) to hold fifteen Mode S subnetwork packets of 160 bytes each in the downlink direction per SVC for a transponder with downlink ELM capability or 28 bytes otherwise;
 - (iii) for two Mode S subnetwork INTERRUPT packets of 35 bytes each (user data field plus control information), one in each direction, for each SVC;
 - (iv) for storing thirty-one Mode S subnetwork packets of 152 bytes each in the uplink direction per SVC

for a transponder with uplink ELM capability or 28 bytes otherwise;

- (v) for the temporary storage of at least one Mode S packet of 160 bytes undergoing M-bit or S-bit processing in each direction per SVC; and
- (vi) of 1 600 bytes in each direction to be shared among all MSPs.

(2) *GDLP buffer requirements*

The GDLP shall be capable of maintaining sufficient buffer space for an average of 4 SVCs for each Mode S aircraft in the coverage area of the interrogators connected to it, assuming all aircraft have ELM capability.

15. Channel number pools of Mode S packet layer processing

- (1) The XDLP shall maintain several SVC channel number pools; the DTE/DCE (ISO 8208) interface uses one set. Its organisation, structure and use shall be as defined in the ISO 8208 standard. The other channel pools shall be used on the ADCE/GDCE interface.
- (2) The GDLP shall manage a pool of temporary channel numbers in the range of 1 to 3, for each ground DTE/ADLP pair. Mode S CALL REQUEST packets generated by the GDLP shall contain the ground DTE address and a temporary channel number allocated from the pool of that ground DTE. The GDLP shall not reuse a temporary channel number allocated to an SVC that is still in the CALL REQUEST State.
- (3) The ADLP shall use the ground DTE address to distinguish the temporary channel numbers used by the various ground DTEs. The ADLP shall assign a permanent channel number (in the range of 1 to 15) to all SVCs and shall inform the GDLP of the assigned number by including it in the Mode S CALL REQUEST by ADLP or Mode S CALL ACCEPT by ADLP packets. The temporary channel number shall be included in the Mode S CALL ACCEPT by ADLP together with the permanent channel number in order to define the association of these channel numbers. The ADLP shall continue to associate

the temporary channel number with the permanent channel number of an SVC until the SVC is returned to the READY (p1) State, or else, while in the DATA TRANSFER (p4) State, a Mode S CALL REQUEST by GDLP packet is received bearing the same temporary channel number. A non-zero permanent channel number in the Mode S CLEAR REQUEST by ADLP, CLEAR REQUEST by GDLP, CLEAR CONFIRMATION by ADLP or CLEAR CONFIRMATION by GDLP packet shall indicate that the permanent channel number shall be used and the temporary channel number shall be ignored. In the event that an XDLP is required to send one of these packets in the absence of a permanent channel number, the permanent channel number shall be set to zero, which shall indicate to the peer XDLP that the temporary channel number is to be used.

- (4) The channel number used by the DTE/DCE interface and that used by the ADCE/GDCE interface shall be assigned independently. The reformatting process shall maintain an association table between the DTE/DCE and the ADCE/GDCE channel numbers.

16. Receive ready and receive not ready conditions of Mode S packet layer processing

The ISO 8208 interface and the ADCE/GDCE interface management procedures shall be independent operations since each system must be able to respond to separate receive ready and receive not ready indications.

17. Processing of m-bit and s-bit sequence of Mode S packet layer processing

Note.— *M-bit processing applies to the sequencing of the DATA packet. S-bit processing applies to the sequencing of Mode S CALL REQUEST, CALL ACCEPT, CLEAR REQUEST and INTERRUPT packets.*

(1) M-bit processing

Note.— *The packet size used on the DTE/DCE interface can be different from that used on the ADCE/GDCE interface.*

- (a) M-bit processing shall be used when DATA packets are reformatted. M-bit processing shall utilize the specifications contained in the ISO 8208 standard. The M-bit sequence

processing shall apply on a per channel basis. The M-bit set to 1 shall indicate that a user data field continues in the subsequent DATA packet. Subsequent packets in an M-bit sequence shall use the same header format (the packet format excluding the user data field).

- (b) If the packet size for the XDCE interface is larger than that used on the DTE/DCE interface, packets shall be combined to the extent possible as dictated by the M-bit, when transmitting a Mode S DATA packet. If the packet size is smaller on the XDCE interface than that defined on the DTE/DCE interface, packets shall be fragmented to fit into the smaller Mode S packet using M-bit assembly.
 - (c) A packet shall be combined with subsequent packets if the packet is filled and more packets exist in the M-bit sequence (M-bit = 1). A packet smaller than the maximum packet size defined for this SVC (partial packet) shall only be allowed when the M-bit indicates the end of an M-bit sequence. A received packet smaller than the maximum packet size with M-bit equal to 1 shall cause a reset to be generated as specified in ISO 8208 and the remainder of the sequence should be discarded.
 - (d) In order to decrease delivery delay, reformatting shall be performed on the partial receipt of an M-bit sequence, rather than delay reformatting until the complete M-bit sequence is received.
- (2) *S-bit processing.* S-bit processing shall apply only to Mode S CALL REQUEST, CALL ACCEPT, CLEAR REQUEST and INTERRUPT packets. This processing shall be performed as specified for M-bit processing in subparagraph (1) except that the packets associated with any S-bit sequence whose reassembly is not completed in T_q seconds (Tables 3-1 and 3-13 of Schedule 3) shall be discarded and receipt of a packet shorter than the maximum packet size with S = 1 shall cause the entire S-bit sequence to be treated as a format error in accordance with Table 3-16 of Schedule 3.

18. Mode S sub network error processing for ISO 8208 packets.

- (1) *D-bit.* If the XDLP receives a DATA packet with the D-bit set to 1, the XDLP shall send a RESET REQUEST packet to the originating DTE containing a cause code (*CC*) = 133 and a diagnostic code (*DC*) = 166. If the D-bit is set to 1 in a CALL REQUEST packet, the D-bit shall be ignored by the XDLP. The D-bit of the corresponding CALL ACCEPT packet shall always be set to 0. The use of *CC* is optional.
- (2) *Q-bit.* If the XDLP receives a DATA packet with the Q-bit set to 1, the XDLP shall send a RESET REQUEST packet to the originating DTE containing *CC* = 133 and *DC* = 83. The use of *CC* is optional.
- (3) *Invalid priority.* If the XDLP receives a call request with a connection priority value equal to 2 through 254, the XDLP shall clear the virtual circuit using *DC* = 66 and *CC* = 131. The use of *CC* is optional.
- (4) *Unsupported facility.* If the XDLP receives a call request with a request for a facility that it cannot support, the XDLP shall clear the virtual circuit using *DC* = 65 and *C* = 131. The use of *CC* is optional.
- (5) *Illegal calling DTE address.* If the XDLP receives a call request with an illegal calling DTE address, the XDLP shall clear the virtual circuit using *DC* = 68 and *CC* = 141. The use of *CC* is optional.
- (6) *Illegal called DTE address.* If the XDLP receives a call request with an illegal called DTE address, the XDLP shall clear the virtual circuit using *DC* = 67 and *CC* = 141. The use of *CC* is optional.

19. Reformatting process of Mode S packet layer processing

- (1) Call request by ADLP
 - (a) Translation into Mode S packets
 - (i) Translated packet format. Reception by the ADLP reformatting process of an ISO 8208 CALL

REQUEST packet from the local DCE shall result in the generation of corresponding Mode S CALL REQUEST by ADLP packet(s) (as determined by S-bit processing in paragraph 17(2) as follows-

| | | | | | | | | | | | | | | | |
|------|------|------|------|-----------------|-----|--------|------|------|------|------|-----|------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | P:1 | FILL:1 | SN:6 | CH:4 | AM:4 | AG:8 | S:1 | FS:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|-----------------|-----|--------|------|------|------|------|-----|------|-----|------|------|

- (ii) Data packet type (DP). This field shall be set to 0.
- (iii) MSP *packet type* (MP). This field shall be set to 1.
- (iv) Supervisory packet (SP). This field shall be set to 1.
- (v) Supervisory type (ST). This field shall be set to 0.
- (vi) *Priority* (P). This field shall be set to 0 for a low priority SVC and to 1 for a high priority SVC. The value for this field shall be obtained from the data transfer field of the priority facility of the ISO 8208 packet, and shall be set to 0 if the ISO 8208 packet does not contain the priority facility or if a priority of 255 is specified. The other fields of the priority facility shall be ignored.
- (vii) *Sequence number* (SN). For a particular SVC, each packet shall be numbered.
- (viii) *Channel number* (CH). The channel number shall be chosen from the pool of SVC channel numbers available to the ADLP. The pool shall consist of 15 values from 1 through 15. The highest available channel number shall be chosen from the pool. An available channel shall be defined as one in State p1. The correspondence between the channel number used by the Mode S subnetwork and the number used by the DTE/DCE interface shall be maintained while the channel is active.

- (ix) *Address, mobile (AM)*. This address shall be the mobile DTE sub-address in the range of 0 to 15. The address shall be extracted from the two least significant digits of the calling DTE address contained in the ISO 8208 packet and converted to binary representation.
- (x) *Address, ground (AG)*. This address shall be the ground DTE address in the range of 0 to 255. The address shall be extracted from the called DTE address contained in the ISO 8208 packet and converted to binary representation.
- (xi) *Fill field*. The fill field shall be used to align subsequent data fields on byte boundaries. When indicated as "FILL:n", the fill field shall be set to a length of "n" bits. When indicated as "FILL1: 0 or 6", the fill field shall be set to a length of 6 bits for a non-multiplexed packet in a downlink SLM frame and 0 bit for all other cases. When indicated as "FILL2: 0 or 2", the fill field shall be set to a length of 0 bit for a non-multiplexed packet in a downlink SLM frame or for a multiplexing header and 2 bits for all other cases.
- (xii) *Sfield (S)*. A value of 1 shall indicate that the packet is part of an S-bit sequence with more packets in the sequence to follow. A value of 0 shall indicate that the sequence ends with this packet. This field shall be set as specified in paragraph 17(2).
- (xiii) *FS field (FS)*. A value of 0 shall indicate that the packet does not contain fast select data. A value of 2 or 3 shall indicate that the packet contains fast select data. A value of 2 shall indicate normal fast select operation. A value of 3 shall indicate fast select with restricted response. An FS value of 1 shall be undefined.
- (xiv) *First packet flag (F)*. This field shall be set to 0 in the first packet of an S-bit sequence and in a packet

that is not part of an S-bit sequence. Otherwise it shall be set to 1.

- (xv) *User data length (LV)*. This field shall indicate the number of full bytes used in the last SLM or ELM segment.
- (xvi) *User data field (UD)*. This field shall only be present if optional CALL REQUEST user data (maximum 16 bytes) or fast select user data (maximum 128 bytes) is contained in the ISO 8208 packet. The user data field shall be transferred from ISO 8208 packet unchanged using S-bit processing as specified in paragraph 17(2).

(b) *Translation into ISO 8208 packets*

- (i) *Translation*. Reception by the GDLP reformatting process of a Mode S CALL REQUEST by ADLP packet (or an S-bit sequence of packets) from the GDCE shall result in the generation of a corresponding ISO 8208 CALL REQUEST packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in paragraph 17(1)(a).
- (ii) *Called DTE, calling DTE address and length fields*. The calling DTE address shall be composed of the aircraft address and the value contained in the AM field of the Mode S packet, converted to BCD. The called DTE address shall be the ground DTE address contained in the AG field of the Mode S packet, converted to BCD. The length field shall be as defined in ISO 8208.

(2) *CALL REQUEST BY GDLP*

(a) *Translation into Mode S packets*

- (i) *General*. Reception by the GDLP reformatting process of an ISO 8208 CALL REQUEST packet from the local DCE shall result in the generation

of corresponding Mode S CALL REQUEST by GDLP packets (as determined by S-bit processing in paragraph 17(2) as follows—

| | | | | | | | | | | | | | | | | |
|------|------|------|------|--------|-----|--------|------|--------|------|------|------|-----|------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL:2 | P:1 | FILL:1 | SN:6 | FILL:2 | TC:2 | AM:4 | AG:8 | S:1 | FS:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|--------|-----|--------|------|--------|------|------|------|-----|------|-----|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) Data packet type (DP). This field shall be set to 0.
 - (iii) MSP packet type (MP). This field shall be set to 1.
 - (iv) Supervisory packet (SP). This field shall be set to 1.
 - (v) Supervisory type (ST). This field shall be set to 0.
 - (vi) *Temporary channel number field (TC)*. This field shall be used to distinguish multiple call requests from a GDLP. The ADLP reformatting process, upon receipt of a temporary channel number, shall assign a channel number from those presently in the READY State, p1.
 - (vii) *Address, ground (AG)*. This address shall be the ground DTE address (in the range of 0 to 255. The address shall be extracted from the calling DTE address contained in the ISO 8208 packet and converted to binary representation.
 - (viii) *Address, mobile (AM)*. This address shall be the mobile DTE sub-address in the range of 0 to 15. The address shall be extracted from the two least significant digits of the called DTE address contained in the ISO 8208 packet and converted to binary representation.
- (b) *Translation into ISO 8208 packets*
- (i) *Translation*. Reception by the ADLP reformatting process of a Mode S CALL REQUEST by GDLP

packet (or an S-bit sequence of packets) from the ADCE shall result in the generation of a corresponding ISO 8208 CALL REQUEST packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (2)(a) with the exceptions as specified in subparagraph (2)(b)(ii).

(ii) *Called DTE, calling DTE address and length fields.* The called DTE address shall be composed of the aircraft address and the value contained in the AM field of the Mode S packet, converted to BCD. The calling DTE address shall be the ground DTE address contained in the AG field of the Mode S packet, converted to BCD. The length field shall be as defined in ISO 8208.

(3) *CALL ACCEPT BY ADLP*

(a) *Translation into Mode S packets*

(i) *Translated packet format.* Reception by the ADLP reformatting process of an ISO 8208 CALL ACCEPT packet from the local DCE shall result in the generation of corresponding Mode S CALL ACCEPT by ADLP packet(s) (as determined by S-bit processing in paragraph 17(2) as follows-

| | | | | | | | | | | | | | | |
|------|------|------|------|-----------------|------|------|------|------|------|-----|--------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | TC:2 | SN:6 | CH:4 | AM:4 | AG:8 | S:1 | FILL:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|-----------------|------|------|------|------|------|-----|--------|-----|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) Data packet type (DP). This field shall be set to 0.
- (iii) MSP packet type (MP). This field shall be set to 1.
- (iv) Supervisory packet (SP). This field shall be set to 1.

- (v) Supervisory type (ST). This field shall be set to 1.
 - (vi) The temporary channel number value in the originating Mode S CALL REQUEST by GDLP packet shall be returned to the GDLP along with the channel number (CH) assigned by the ADLP.
 - (vii) The field shall be set equal to the channel number assigned by the ADLP as determined during the CALL REQUEST procedures for the Mode S connection.
 - (viii) *Address, mobile and address, ground.* The AM and AG values in the originating Mode S CALL REQUEST by GDLP packet shall be returned in these fields. When present, DTE addresses in the ISO 8208 CALL ACCEPT packet shall be ignored.
- (b) *Translation into ISO 8208 packets*
- (i) *Translation.* Reception by the GDLP reformatting process of a Mode S CALL ACCEPT by ADLP packet (or an S-bit sequence of packets) from the GDCE shall result in the generation of a corresponding ISO 8208 CALL ACCEPT packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in paragraph 20(1) with the exceptions as specified in subparagraph (3) (b) (ii).
 - (ii) *Called DTE, calling DTE address and length fields.* Where present, the called DTE address shall be composed of the aircraft address and the value contained in the AM field of the Mode S packet, converted to BCD. Where present, the calling DTE address shall be the ground DTE address contained in the AG field of the Mode S packet, converted to BCD. The length field shall be as defined in ISO 8208.

- (4) *CALL ACCEPT BY GDLP*
 (a) *Translation into Mode S packets*

- (i) *Translated packet format.* Reception by the GDLP reformatting process of an ISO 8208 CALL ACCEPT packet from the local DCE shall result in the generation of corresponding Mode S CALL ACCEPT by GDLP packet(s) (as determined by S-bit processing paragraph 17(2) as follows-

| | | | | | | | | | | | | | | |
|------|------|------|------|--------|--------|------|------|------|------|-----|--------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL:2 | FILL:2 | SN:6 | CH:4 | AM:4 | AG:8 | S:1 | FILL:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|--------|--------|------|------|------|------|-----|--------|-----|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) *Data packet type (DP).* This field shall be set to 0.
- (iii) *MSP packet type (MP).* This field shall be set to 1.
- (iv) *Supervisory packet (SP).* This field shall be set to 1.
- (v) *Supervisory type (ST).* This field shall be set to 1.
- (vi) *Address, mobile and address, ground.* The AM and AG values in the originating Mode S CALL REQUEST by ADLP packet shall be returned in these fields. When present, DTE addresses in the ISO 8208 CALL ACCEPT packet shall be ignored.
- (b) *Translation into ISO 8208 packets*
 (i) *Translation.* Reception by the ADLP reformatting process of a Mode S CALL ACCEPT by GDLP packet (or an S-bit sequence of packets) from the ADCE shall result in the generation of a corresponding ISO 8208 CALL ACCEPT packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (4)(a)

with the exceptions as specified in subparagraph (4)(a)(ii).

- (ii) *Called DTE, calling DTE address and length fields.* Where present, the calling DTE address shall be composed of the aircraft address and the value contained in the AM field of the Mode S packet, converted to BCD. Where present, the called DTE address shall be the ground DTE address contained in the AG field of the Mode S packet, converted to BCD. The length field shall be as defined in ISO 8208.

(5) *CLEAR REQUEST BY ADLP*

- (a) *Translation into Mode S packets*

- (i) *Translated packet format.* Reception by the ADLP reformatting process of an ISO 8208 CLEAR REQUEST packet from the local DCE shall result in the generation of a corresponding Mode S CLEAR REQUEST by ADLP packet(s) (as determined by S-bit processing paragraph 17(2) as follows—

| | | | | | | | | | | | | | | | | |
|------|------|------|------|------------------|------|------|------|------|------|------|------|-----|--------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL:2:0 or 2 | TC:2 | SN:6 | CH:4 | AM:4 | AG:8 | CC:8 | DC:8 | S:1 | FILL:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|------------------|------|------|------|------|------|------|------|-----|--------|-----|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1) and (2).

- (ii) Data packet type (DP). This field shall be set to 0.
- (iii) MSP packet type (MP). This field shall be set to 1.
- (iv) Supervisory packet (SP). This field shall be set to 1.
- (v) Channel number (CH): If a channel number has been allocated during the call acceptance phase, then CH shall be set to that value, otherwise it shall be set to zero.

- (vi) Temporary channel (TC): If a channel number has been allocated during the call acceptance phase, then TC shall be set to zero, otherwise it shall be set to the value used in the CALL REQUEST by GDLP.
 - (vii) Supervisory type (ST). This field shall be set to 2.
 - (viii) Address, ground or address, mobile. The AG and AM values in the originating Mode S CALL REQUEST by ADLP or CALL REQUEST by GDLP packets shall be returned in these fields. When present, DTE addresses in the ISO 8208 CLEAR REQUEST packet shall be ignored.
 - (ix) Clearing cause (CC) and diagnostic code (DC) fields. These fields shall be transferred without modification from the ISO 8208 packet to the Mode S packet when the DTE has initiated the clear procedure. If the XDLP has initiated the clear procedure, the clearing cause field and diagnostic field shall be as defined in the State tables for the DCE and XDCE -The coding *and definition* of these fields shall be as specified in ISO 8208.
- (b) Translation into ISO 8208 packets
- (i) Translation. Reception by the GDLP reformatting process of a Mode S CLEAR REQUEST by ADLP packet (or an S-bit sequence of packets) from the local GDCE shall result in the generation of a corresponding ISO 8208 CLEAR REQUEST packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (5)(a) with the exceptions specified in subparagraph (5)(b)(ii) and (5)(b)(iii).
 - (ii) *Called DTE, calling DTE and length fields.* These fields shall be omitted in the ISO 8208 CLEAR REQUEST packet.

(iii) *Clearing cause field.* This field shall be set taking account paragraph 23(3).

(6) **Clear request by *GDLP***

(a) *Translation into Mode S packets*

(i) *Translated packet format.* Reception by the GDLP reformatting process of an ISO 8208 CLEAR REQUEST packet from the local DCE shall result in the generation of corresponding Mode S CLEAR REQUEST by GDLP packet(s) (as determined by S-bit processing paragraph 17(2) as follows-

| | | | | | | | | | | | | | | | | |
|------|------|------|------|--------|------|------|------|------|------|------|------|-----|--------|-----|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL:2 | TC:2 | SN:6 | CH:4 | AM:4 | AG:8 | CC:8 | DC:8 | S:1 | FILL:2 | F:1 | LV:4 | UD:v |
|------|------|------|------|--------|------|------|------|------|------|------|------|-----|--------|-----|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1), (2) and (5).

- (ii) Data packet type (DP). This field shall be set to 0.
- (iii) MSP packet type (MP). This field shall be set to 1.
- (iv) Supervisory packet (SP). This field shall be set to 1.
- (v) Channel number (CH): If a channel number has been allocated during the call acceptance phase, then CH shall be set to that value, otherwise it shall be set to zero.
- (vi) Temporary channel (TC): If a channel number has been allocated during the call acceptance phase, then TC shall be set to zero, otherwise it shall be set to the value used in the CALL REQUEST by GDLP.
- (vii) Supervisory *type (ST)*. This field shall be set to 2.

(b) *Translation into ISO 8208 packets*

(i) *Translation.* Reception by the ADLP reformatting process of a Mode S CLEAR REQUEST by

GDLP packet (or an S-bit sequence of packets) from the local ADCE shall result in the generation of a corresponding ISO 8208 CLEAR REQUEST packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (6)(a).

- (ii) *Called DTE, calling DTE and length fields.* These fields shall be omitted in the ISO 8208 CLEAR REQUEST packet.

(7) Data

(a) *Translation into Mode S packets*

- (i) *Translated packet format.* Reception by the XDLP reformatting process of ISO 8208 DATA packet(s) from the local DCE shall result in the generation of corresponding Mode S DATA packet(s) as determined by M-bit processing in paragraph 17(1)(b), as follows-

| | | | | | | | | |
|------|-----|------|--------------|------|------|------|------|------|
| DP:1 | M:1 | SN:6 | FILL1:0 or 6 | PS:4 | PR:4 | CH:4 | LV:4 | UD:v |
|------|-----|------|--------------|------|------|------|------|------|

- (ii) Data packet type (DP). This field shall be set to 1.
- (iii) M field (M). A value of 1 shall indicate that the packet is part of an M-bit sequence with more packets in the sequence to follow. A value of 0 shall indicate that the sequence ends with this packet. The appropriate value shall be placed in the M-bit field of the Mode S packet.
- (iv) Sequence number (SN). The sequence number field shall be set as specified in subparagraph (1) (a)(vii).
- (v) Packet send sequence number (PS). The packet send sequence number field shall be set as specified in paragraph 24 (4).

- (vi) Packet receive sequence number (PR). The packet receive sequence number field shall be set as specified in paragraph 24(4).
 - (vii) The channel number field shall contain the Mode S channel number that corresponds to the incoming ISO 8208 DATA packet channel number.
 - (viii) The user data length shall indicate the number of full bytes used in the last SLM or ELM segment as defined in paragraph 4(1).
 - (ix) Fill (FILL1) field shall be set as specified in subparagraph (1)(a)(xi).
 - (x) The user data shall be transferred from the ISO 8208 packet to the Mode S packet utilizing the M-bit packet assembly processing as required.
- (b) *Translation into ISO 8208 packets.* Reception by the XDLP reformatting process of Mode S DATA packet(s) from the local XDCE shall result in the generation of corresponding ISO 8208 DATA packet(s) to the local DCE. The translation from Mode S packet(s) to the ISO 8208 packet(s) shall be the inverse of the processing defined in subparagraph (7)(a).

(8) Interrupt

(a) *Translation into Mode S packets*

- (i) *Translated packet format.* Reception by the XDLP reformatting process of an ISO 8208 INTERRUPT packet from the local DCE shall result in the generation of corresponding Mode S INTERRUPT packet(s) (as determined by S-bit processing in paragraph 17(1) as follows-

| | | | | | | | | | | |
|------|------|------|------|-----------------|-----|-----|------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | S:1 | F:1 | SN:6 | CH:4 | LV:4 | UD:v |
|------|------|------|------|-----------------|-----|-----|------|------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) Data packet type (DP). This field shall be set to 0.
 - (iii) MSP packet type (MP). This field shall be set to 1.
 - (iv) Supervisory packet (SP). This field shall be set to 3.
 - (v) Supervisory type (ST). This field shall be set to 1.
 - (vi) User data length (LV). This field shall be set as specified in paragraph 4(1).
 - (vii) User data (UD). The user data shall be transferred from the ISO 8208 packet to the Mode S packet using the S-bit packet reassembly processing as required. The maximum size of the user data field for an INTERRUPT packet shall be 32 bytes.
- (b) *Translation into ISO 8208 packets.* Reception by the XDLP reformatting process of Mode S INTERRUPT packet(s) from the local XDCE shall result in the generation of a corresponding ISO 8208 INTERRUPT packet to the local DCE. The translation from the Mode S packet(s) to the ISO 8208 packet shall be the inverse of the processing defined in paragraph (8)(a).

(9) INTERRUPT CONFIRMATION

- (a) *Translation into Mode S packets*
 - (i) Translated *packet format*. Reception by the XDLP reformatting process of an ISO 8208 INTERRUPT CONFIRMATION packet from the local DCE shall result in the generation of a corresponding Mode S INTERRUPT CONFIRMATION packet as follows—

| | | | | | | | | |
|------|------|------|------|------|--------------|------|------|--------|
| DP:1 | MP:1 | SP:2 | ST:2 | SS:2 | FILL2:0 or 2 | SN:6 | CH:4 | FILL:4 |
|------|------|------|------|------|--------------|------|------|--------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) Data packet type (DP). This field shall be set to 0.
 - (iii) MSP packet type (MP). This field shall be set to 1.
 - (iv) Supervisory packet (SP). This field shall be set to 3.
 - (v) Supervisory type (ST). This field shall be set to 3.
 - (vi) Supervisory *subset* (SS). This field shall be set to 0.
- (b) *Translation into ISO 8208 packets.* Reception by the XDLP reformatting process of a Mode S INTERRUPT CONFIRMATION packet from the local XDCE shall result in the generation of a corresponding ISO 8208 INTERRUPT CONFIRMATION packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (9)(a).

(10) *Reset request*

- (a) *Translation into Mode S packets*
 - (i) *Translated packet format.* Reception by the XDLP reformatting process of an ISO 8208 RESET REQUEST packet from the local DCE shall result in the generation of a corresponding Mode S RESET REQUEST packet as follows-

| | | | | | | | | | | |
|------|------|------|------|-----------------|--------|------|------|--------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | FILL:2 | SN:6 | CH:4 | FILL:4 | RC:8 | DC:8 |
|------|------|------|------|-----------------|--------|------|------|--------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1).

- (ii) Data packet type (DP). This field shall be set to 0.
- (iii) MSP packet type (MP). This field shall be set to 1.
- (iv) Supervisory packet (SP). This field shall be set to 2.

- (v) Supervisory type (ST). This field shall be set to 2.
 - (vi) Reset cause code (RC) and diagnostic code (DC). The reset cause and diagnostic codes used in the Mode S RESET REQUEST packet shall be as specified in the ISO 8208 packet when the reset procedure is initiated by the DTE. If the reset procedure originates with the DCE, the DCE State tables shall specify the diagnostic fields coding. In this case, bit 8 of the reset cause field shall be set to 0.
- (b) *Translation into ISO 8208 packets.* Reception by the XDLP reformatting process of a Mode S RESET packet from the local XDCE shall result in the generation of a corresponding ISO 8208 RESET packet to the local DCE. The translation from the Mode S packet to the ISO 8208 packet shall be the inverse of the processing defined in subparagraph (10) (a).
- (11) *ISO 8208 RESTART REQUEST to Mode S CLEAR REQUEST.* The receipt of an ISO 8208 RESTART REQUEST from the local DCE shall result in the reformatting process generating a Mode S CLEAR REQUEST by ADLP or Mode S CLEAR REQUEST by GDLP for all SVCs associated with the requesting DTE. The fields of the Mode S CLEAR REQUEST packets shall be set as specified in subparagraph (5) and (6).

20. Packets local to the mode S sub network

- (1) *Mode S receive ready*
- (a) *Packet format.* The Mode S RECEIVE READY packet arriving from an XDLP is not related to the control of the DTE/DCE interface and shall not cause the generation of an ISO 8208 packet. The format of the packet shall be as follows—

| | | | | | | | | |
|------|------|------|------|--------------|--------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | FILL:2 | SN:6 | CH:4 | PR:4 |
|------|------|------|------|--------------|--------|------|------|------|

- (b) *Data packet type (DP). This field shall be set to 0.*
- (c) *MSP packet type (MP). This field shall be set to 1.*
- (d) *Supervisory packet (SP). This field shall be set to 2.*
- (e) *Supervisory type (ST). This field shall be set to 0.*
- (f) *Packet receive sequence number (PR). This field shall be set as specified in paragraph 24(4).*

(2) *Mode S Receive Not Ready*

- (a) *Packet format.* The Mode S RECEIVE NOT READY packet arriving from an XDLP is not related to the control of the DTE/DCE interface and shall not cause the generation of an ISO 8208 packet. The format of the packet shall be as follows—

| | | | | | | | | |
|------|------|------|------|--------------|--------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | FILL:2 | SN:6 | CH:4 | PR:4 |
|------|------|------|------|--------------|--------|------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in paragraph 19(1). The packet shall be processed as specified in paragraph 26.

- (b) *Data packet type (DP). This field shall be set to 0.*
- (c) *MSP packet type (MP). This field shall be set to 1.*
- (d) *Supervisory packet (SP). This field shall be set to 2.*
- (e) *Supervisory type (ST). This field shall be set to 1.*
- (f) *Packet receive sequence number (PR). This field shall be set as specified in paragraph 24(4).*

(3) *Mode S route*

- (a) *Packet format.* The format for the packet shall be as follows—

| | | | | | | | | | |
|------|------|------|------|------|------|-------|------|------------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | OF:1 | IN:1 | RTL:8 | RT:v | ODL:0 or 8 | OD:v |
|------|------|------|------|------|------|-------|------|------------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in paragraph 19(1). The packet shall only be generated by the GDLP. It shall be processed by the ADLP as specified in paragraph 36(2) and shall have a maximum size as specified in paragraph 24(1) (a).

- (b) Data packet type (DP). This field shall be set to 0.
- (c) MSP packet type (MP). This field shall be set to 1.
- (d) Supervisory packet (SP). This field shall be set to 3.
- (e) Supervisory type (ST). This field shall be set to 0.
- (f) Option flag (OF). This field shall indicate the presence of the optional data length (ODL) and optional data (OD) fields. OF shall be set to 1 if ODL and OD are present. Otherwise it shall be set to 0.
- (g) Initialisation bit (IN). This field shall indicate the requirement for subnetwork initialisation . It shall be set by the GDLP as specified in paragraph 36(2).
- (h) Route table length (RTL). This field shall indicate the size of the route table, expressed in bytes.
- (i) Route table (RT)
 - (i) *Contents*. This table shall consist of a variable number of entries each containing information specifying the addition or deletion of entries in the II code-DTE cross-reference table.
 - (ii) *Entries*. Each entry in the route table shall consist of the II code, a list of up to 8 ground DTE addresses, and a flag indicating whether the resulting II code-DTE pairs shall be added or deleted from the II code-DTE cross-reference table. A route table entry shall be coded as follows—

| | | | |
|------|------|------|-------|
| II:4 | AD:1 | ND:3 | DAL:v |
|------|------|------|-------|

- (iii) *Interrogator identifier (II)*. This field shall contain the 4-bit II code.
 - (iv) *Add/delete flag (AD)*. This field shall indicate whether the II code-DTE pairs shall be added (AD = 1) or deleted (AD = 0) from the II code-DTE cross-reference table.
 - (v) *Number of DTE addresses (ND)*. This field shall be expressed in binary in the range from 0 to 7 and shall indicate the number of DTE addresses present in DAL minus 1 (in order to allow from 1 to 8 DTE addresses).
 - (vi) *DTE address list (DAL)*. This list shall consist of up to 8 DTE addresses, expressed in 8-bit binary representation.
 - (j) *Optional data length (ODL)*. This field shall contain the length in bytes of the following OD field.
 - (k) *Optional data (OD)*. This variable length field shall contain optional data.
- (4) Mode S clear confirmation by ADLP
- (a) *Packet format*. The format for this packet shall be as follows—

| | | | | | | | | | |
|------|------|------|------|--------------|------|------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | TC:2 | SN:6 | CH:4 | AM:4 | AG:8 |
|------|------|------|------|--------------|------|------|------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1) and paragraph 19(5). This packet shall be processed as specified in paragraph 23.

- (b) *Data packet type (DP)*. This field shall be set to 0.
- (c) *MSP packet type (MP)*. This field shall be set to 1.

- (d) Supervisory packet (SP). This field shall be set to 1.
- (e) Channel number (CH): If a channel number has been allocated during the call acceptance phase, then CH shall be set to that value, otherwise it shall be set to zero.
- (f) Temporary channel (TC): If a channel number has been allocated during the call acceptance phase, then TC shall be set to zero, otherwise it shall be set to the value used in the CALL REQUEST by GDLP.
- (g) Supervisory type (ST). This field shall be set to 3.

(5) Mode S clear confirmation by GDLP

- (a) *Packet format.* The format for this packet shall be as follows—

| | | | | | | | | | |
|------|------|------|------|--------|------|------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL:2 | TC:2 | SN:6 | CH:4 | AM:4 | AG:8 |
|------|------|------|------|--------|------|------|------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in subparagraph (1) and paragraph 19(6). This packet shall be processed as specified in paragraph 23.

- (b) Data packet type (DP). This field shall be set to 0.
- (c) MSP packet type (MP). This field shall be set to 1.
- (d) Supervisory packet (SP). This field shall be set to 1.
- (e) Channel number (CH): If a channel number has been allocated during the call acceptance phase, then CH shall be set to that value, otherwise it shall be set to zero.
- (f) Temporary channel (TC): If a channel number has been allocated during the call acceptance phase, then TC shall be set to zero, otherwise it shall be set to the value used in the CALL REQUEST by GDLP.
- (g) Supervisory type (ST). This field shall be set to 3.

(6) *Mode S reset confirmation*

- (a) *Packet format.* The format for this packet shall be as follows—

| | | | | | | | | |
|------|------|------|------|--------------|--------|------|------|--------|
| DP:1 | MP:1 | SP:2 | ST:2 | FILL2:0 or 2 | FILL:2 | SN:6 | CH:4 | FILL:4 |
|------|------|------|------|--------------|--------|------|------|--------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in paragraph 19(1). This packet shall be processed as specified in Table 3 -7 of Schedule 3.

- (b) *Data packet type (DP)*. This field shall be set to 0.
 - (c) *MSP packet type (MP)*. This field shall be set to 1.
 - (d) *Supervisory packet (SP)*. This field shall be set to 2.
 - (e) *Supervisory type (ST)*. This field shall be set to 3.
- (7) *Mode S reject*
- (a) *Packet format*. The format for this packet shall be as follows—

| | | | | | | | | |
|------|------|------|------|------|--------------|------|------|------|
| DP:1 | MP:1 | SP:2 | ST:2 | SS:2 | FILL2:0 or 2 | SN:6 | CH:4 | PR:4 |
|------|------|------|------|------|--------------|------|------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in 1.5.1.1. This packet shall be processed as specified in 1.6.8.

- (b) *Data packet type (DP)*. This field shall be set to 0.
- (c) *MSP packet type (MP)*. This field shall be set to 1.
- (d) *Supervisory packet (SP)*. This field shall be set to 3.
- (e) *Supervisory type (ST)*. This field shall be set to 3.
- (f) *Supervisory subset (SS)*. This field shall be set to 1.
- (g) *Packet receive sequence number (PR)*. This field shall be set as specified in paragraph 24(4).

XDCE operation

21. State transitions of an XDCE operation.

Note.— The ADCE process within the ADLP acts as a peer process to the GDCE process in the GDLP

The XDCE shall operate as a State machine. Upon entering a State, the XDCE shall perform the actions specified in Table 3-7 of Schedule 3. State transition and additional actions shall be as specified in Table 3-8 through Table 3-18 of Schedule 3.

Note 1.— The next State transition (if any) that occurs when the XDCE receives a packet from the peer XDCE is specified by Table 3-8 through Table 3-19 of Schedule 3. The same transitions are defined in Table 3-16 through Table 3-18 of Schedule 3 when the XDCE receives a packet from the DCE (via the reformatting process).

Note 2.— The XDCE State hierarchy is the same as for the DCE as presented in Figure 3-2 of Schedule 3, except that States r2, r3 and p5 are omitted.

22. Disposition of packets of an XDCE operation

- (1) Upon receipt of a packet from the peer XDCE, the packet shall be forwarded or not forwarded to the DCE (via the reformatting process) according to the parenthetical instructions contained in Tables 3-11 to 3-15 of Schedule 3. If no parenthetical instruction is listed or if the parenthetical instruction indicates “do not forward” the packet shall be discarded.
- (2) Upon receipt of a packet from the DCE (via the reformatting process), the packet shall be forwarded or not forwarded to the peer XDCE according to the parenthetical instructions contained in Tables 3-16 to 3-18 of Schedule 3. If no parenthetical instruction is listed or if the parenthetical instruction indicates “do not forward” the packet shall be discarded.

23. SVC call setup and clear procedure of an XDCE operation

- (1) *Setup procedures.* Upon receipt of a CALL REQUEST from the DCE or peer XDCE, the XDLP shall determine if sufficient resources exist to operate the SVC. This shall include: sufficient buffer space and an available p1 State SVC. Upon acceptance of the CALL REQUEST from the DCE (via the reformatting process), the Mode S CALL REQUEST packet shall be forwarded to frame processing. Upon acceptance of a Mode S CALL REQUEST

from the peer XDCE (via frame processing), the Mode S CALL REQUEST shall be sent to the *reformatting process*.

- (2) *Aborting a call request. If the DTE and/or the peer XDCE abort a call before they have received a CALL ACCEPT packet, they shall indicate this condition by issuing a CLEAR REQUEST packet. Procedures for handling these cases shall be as specified in Table 3-12 and Table 3-16 of Schedule 3.*
- (3) *Virtual call clearing*
 - (a) If the XDCE receives a Mode S CALL REQUEST from the reformatting process that it cannot support, it shall initiate a Mode S CLEAR REQUEST packet that is sent to the DCE (via the reformatting process) for transfer to the DTE (the DCE thus enters the DCE CLEAR REQUEST to DTE State, p7).
 - (b) If the XDCE receives a Mode S CALL REQUEST packet from the peer XDCE (via frame processing) which it cannot support, it shall enter the State p7.
 - (c) A means shall be provided to advise the DTE whether an SVC has been cleared due to the action of the peer DTE or due to a problem within the sub network itself.
 - (d) The requirement of subparagraph (c) shall be satisfied by setting bit 8 of the cause field to 1 to indicate that the problem originated in the Mode S sub network and not in the DTE. The diagnostic and cause codes shall be set as follows—
 - (i) no channel number available, DC = 71, CC = 133;
 - (ii) buffer space not available, DC = 71, CC = 133;
 - (iii) DTE not operational, DC = 162, CC = 141; and
 - (iv) link failure, DC = 225, CC = 137.
 - (e) If the ADLP receives a Mode S ROUTE packet with the IN bit set to ONE, the ADLP shall perform local initialisation

by clearing Mode S SVCs associated with the DTE addresses contained in the ROUTE packet. If the GDLP receives a search request (Table 3-23 of Schedule 3) from an ADLP, the GDLP shall perform local initialisation by clearing Mode S SVCs associated with that ADLP. Local initialisation shall be accomplished by—

- (i) releasing all allocated resources associated with these SVCs (including the resequencing buffers);
- (ii) returning these SVCs to the ADCE ready State (p1); and
- (iii) Sending Mode S CLEAR REQUEST packets for these SVCs to the DCE (via the reformatting process) for transfer to the DTE.

(4) *Clear confirmation.* When the XDCE receives a Mode S CLEAR CONFIRMATION packet, the remaining allocated resources to manage the SVC shall be released (including the resequencing buffers) and the SVC shall be returned to the p1 State. Mode S CLEAR CONFIRMATION packets shall not be transferred to the reformatting process.

(5) *Clear collision.* A clear collision occurs at the XDCE when it receives a Mode S CLEAR REQUEST packet from the DCE (via the reformatting process) and then receives a Mode S CLEAR REQUEST packet from the peer XDCE (or vice versa). In this event, the XDCE does not expect to receive a Mode S CLEAR CONFIRMATION packet for this SVC and shall consider the clearing complete.

(6) *Packet processing.* The XDCE shall treat an S-bit sequence of Mode S CALL REQUEST, CALL ACCEPT and CLEAR REQUEST packets as a single entity.

24. Data transfer and interrupt procedures of an XDCE operation.

(1) *General*

- (a) Data transfer and interrupt procedures shall apply independently to each SVC. The contents of the user

data field shall be passed transparently to the DCE or to the peer XDCE. Data shall be transferred in the order dictated by the sequence numbers assigned to the data packets.

- (b) To transfer DATA packets, the SVC shall be in a FLOW CONTROL READY State (*d1*).

(2) *Mode S packet size*

- (a) The maximum size of Mode S packets shall be 152 bytes in the uplink direction and 160 bytes in the downlink direction for installations that have full uplink and downlink ELM capability. The maximum downlink packet size for level four transponders with less than 16 segment downlink ELM capability shall be 10 bytes times the maximum number of downlink ELM segments that the transponder specifies in its data link capability report. If there is no ELM capability, the maximum Mode S packet size shall be 28 bytes.
- (b) The Mode S sub network shall allow packets of less than the maximum size to be transferred.

(3) *Flow control window size*

The flow control window size of the Mode S sub network shall be independent of that used on the DTE/DCE interface. The Mode S sub network window size shall be 15 packets in the uplink and downlink directions.

(4) *SVC flow control*

- (a) Flow control shall be managed by means of a sequence number for received packets (PR) and one for packets that have been sent (PS). A sequence number (PS) shall be assigned for each Mode S DATA packet generated by the XDLP for each SVC. The first Mode S DATA packet transferred by the XDCE to frame processing when the SVC has just entered the flow control ready State shall be numbered zero. The first Mode S packet received from the peer XDCE after an SVC has just entered the flow

control ready State shall be numbered zero. Subsequent packets shall be numbered consecutively.

- (b) A source of Mode S DATA packets (the ADCE or GDCE) shall not send (without permission from the receiver) more Mode S DATA packets than would fill the flow control window. The receiver shall give explicit permission to send more packets.
- (c) The permission information shall be in the form of the next expected packet sequence number and shall be denoted PR. If a receiver wishes to update the window and it has data to transmit to the sender, a Mode S DATA packet shall be used for information transfer. If the window must be updated and no data are to be sent, a Mode S RECEIVE READY (RR) or Mode S RECEIVE NOT READY (RNR) packet shall be sent. At this point, the “sliding window” shall be moved to begin at the new PR value. The XDCE shall now be authorised to transfer more packets without acknowledgement up to the window limit.
- (d) When the sequence number (PS) of the next Mode S DATA packet to be sent is in the range $PR \leq PS \leq PR + 14$ (modulo 16), the sequence number shall be defined to be “in the window” and the XDCE shall be authorised to transmit the packet. Otherwise, the sequence number (PS) of the packet shall be defined to be “outside the window” and the XDCE shall not transmit the packet to the peer XDCE.
- (e) When the sequence number (PS) of the packet received is next in sequence and within the window, the XDCE shall accept this packet. Receipt of a packet with a PS:
 - (i) outside the window; or
 - (ii) out of sequence; or
 - (iii) not equal to 0 for the first data packet after entering FLOW CONTROL READY State (d1); shall be considered an error (see paragraph 28).

- (f) The receipt of a Mode S DATA packet with a valid PS number (i.e. the next PS in sequence) shall cause the lower window PR to be changed to that PS value plus 1. The packet receive sequence number (PR) shall be conveyed to the originating XDLP by a Mode S DATA, RECEIVE READY, RECEIVE NOT READY, or REJECT packet. A valid PR value shall be transmitted by the XDCE to the peer XDCE after the receipt of 8 packets provided that sufficient buffer space exists to store 15 packets. Incrementing the PR and PS fields shall be performed using modulo 16 arithmetic.
 - (g) A copy of a packet shall be retained until the user data has been successfully transferred. Following successful transfer, the PS value shall be updated.
 - (h) The PR value for user data shall be updated as soon as the required buffer space for the window (as determined by flow control management) is available within the DCE.
 - (i) Flow control management shall be provided between the DCE and XDCE.
- (5) *Interrupt procedures for switched virtual circuits*
- (a) If user data is to be sent via the Mode S subnetwork without following the flow control procedures, the interrupt procedures shall be used. The interrupt procedure shall have no effect on the normal data packet and flow control procedures. An interrupt packet shall be delivered to the DTE (or the transponder or interrogator interface) at or before the point in the stream of data at which the interrupt was generated. The processing of a Mode S INTERRUPT packet shall occur as soon as it is received by the XDCE.
 - (b) The XDCE shall treat an S-bit sequence of Mode S INTERRUPT packets as a single entity.

- (c) Interrupt processing shall have precedence over any other processing for the SVC occurring at the time of the interrupt.
- (d) The reception of a Mode S INTERRUPT packet before the previous interrupt of the SVC has been confirmed (by the receipt of a Mode S INTERRUPT CONFIRMATION packet) shall be defined as an error. The error results in a reset (see Table 3-14 of Schedule 3).

25. Receive ready procedure of an XDCE operation

- (1) The Mode S RECEIVE READY packet shall be sent if no Mode S DATA packets (that normally contain the updated PR value) are available for transmittal and it is necessary to transfer the latest PR value. It also shall be sent to terminate a receiver not ready condition.
- (2) Receipt of the Mode S RECEIVE READY packet by the XDCE shall cause the XDCE to update its value of PR for the outgoing SVC. It shall not be taken as a demand for retransmission of packets that have already been transmitted and are still in the window.
- (3) Upon receipt of the Mode S RECEIVE READY packet, the XDCE shall go into the ADLP (GDLP) RECEIVE READY State (g1).

26. Receive not ready procedure of an XDCE operation

- (1) The Mode S RECEIVE NOT READY packet shall be used to indicate a temporary inability to accept additional DATA packets for the given SVC. The Mode S RNR condition shall be cleared by the receipt of a Mode S RR packet or a Mode S REJECT packet.
- (2) When the XDCE receives a Mode S RECEIVE NOT READY packet from the peer XDCE, it shall update its value of PR for the SVC and stop transmitting Mode S DATA packets on the SVC to the XDLP. The XDCE shall go into the ADLP (GDLP) RECEIVE NOT READY State (g2).

- (3) The XDCE shall transmit a Mode S RECEIVE NOT READY packet to the peer XDCE if it is unable to receive from the peer XDCE any more Mode S DATA packets on the indicated SVC. Under these conditions, the XDCE shall go into the ADCE (GDCE) RECEIVE NOT READY State (f2).

27. Reset procedure of an XDCE operation

- (1) When the XDCE receives a Mode S RESET REQUEST packet from either the peer XDCE or the DCE (via the reformatting process) or due to an error condition performs its own reset, the following actions shall be taken—
 - (a) those Mode S DATA packets that have been transmitted to the peer XDCE shall be removed from the window;
 - (b) those Mode S DATA packets that are not transmitted to the peer XDCE but are contained in an M-bit sequence for which some packets have been transmitted shall be deleted from the queue of DATA packets awaiting transmission;
 - (c) those Mode S DATA packets received from the peer XDCE that are part of an incomplete M-bit sequence shall be discarded;
 - (d) the lower window edge shall be set to 0 and the next packet sent shall have a sequence number (PS) of 0;
 - (e) any outstanding Mode S INTERRUPT packets to or from the peer XDCE shall be left unconfirmed;
 - (f) any Mode S INTERRUPT packet awaiting transfer shall be discarded;
 - (g) data packets awaiting transfer shall not be discarded (unless they are part of a partially transferred M-bit sequence); and
 - (h) the transition to d1 shall also include a transition to i1, j1, f1 and g1.

- (2) The reset procedure shall apply to the DATA TRANSFER State (p4). The error procedure in Table 3-12 of Schedule 3 shall be followed. In any other State the reset procedure shall be abandoned.

28. Reject procedure of an XDCE operation

- (1) When the XDCE receives a Mode S DATA packet from the peer XDCE with incorrect format or whose packet sequence number (PS) is not within the defined window (Table 3-1 of Schedule 3) or is out of sequence, it shall discard the received packet and send a Mode S REJECT packet to the peer XDCE via frame processing. The Mode S REJECT packet shall indicate a value of PR for which retransmission of the Mode S DATA packets is to begin. The XDCE shall discard subsequent out-of-sequence Mode S DATA packets whose receipt occurs while the Mode S REJECT packet response is still outstanding.
- (2) When the XDCE receives a Mode S REJECT packet from the peer XDCE, it shall update its lower window value with the new value of PR and begin to (re)transmit packets with a sequence number of PR.
- (3) Reject indications shall not be transferred to the DCE. If the ISO 8208 interface supports the reject procedures, the reject indications occurring on the ISO 8208 interface shall not be transferred between the DCE and the XDCE.

29. Packet re-sequencing and duplicate suppression of an XDCE operation

- (1) Resequencing shall be performed independently for the uplink and downlink transfers of each Mode S SVC. The following variables and parameters shall be used—
 - (a) SNR A 6-bit variable indicating the sequence number of a received packet on a specific SVC. It is contained in the SN field of the packet (see paragraph 19(1)(a)(vii)).

- (b) NESN The next expected sequence number following a series of consecutive sequence numbers. HSNR The highest value of SNR in the resequencing window.
- (c) Tq Resequencing timers (see Tables 3-1 and 3-13 of Schedule 3) associated with a specific SVC.

All operations involving the sequence number (SN) shall be performed modulo 64.

- (2) The range of SNR values between NESN – 32 and NESN – 1 inclusive shall be denoted the duplication window.
- (3) The range of SNR values between NESN + 1 and NESN + 31 inclusive shall be denoted the resequencing window. Received packets with a sequence number value in this range shall be stored in the resequencing window in sequence number order.
- (4) Transmission functions
 - (a) For each SVC, the first packet sent to establish a connection (the first Mode S CALL REQUEST or first Mode S CALL ACCEPT packet) shall cause the value of the SN field to be initialised to zero. The value of the SN field shall be incremented after the transmission (or retransmission) of each packet.
 - (b) The maximum number of unacknowledged sequence numbers shall be 32 consecutive SN numbers. Should this condition be reached, then it shall be treated as an error and the channel cleared.
- (5) Receive functions
 - (a) The resequencing algorithm shall maintain the variables HSNR and NESN for each SVC. NESN shall be initialised to 0 for all SVCs and shall be reset to 0 when the SVC re-enters the channel number pool.
 - (b) Processing of packets within the duplication window. If a packet is received with a sequence number value within the duplication window, the packet shall be discarded.

- (c) Processing of packets within the resequencing window. If a packet is received with a sequence number within the resequencing window, it shall be discarded as a duplicate if a packet with the same sequence number has already been received and stored in the resequencing window. Otherwise, the packet shall be stored in the resequencing window. Then, if no Tq timers are running, HSNR shall be set to the value of SNR for this packet and a Tq timer shall be started with its initial value (Tables 3-1 and 3-13 of Schedule 3). If at least one Tq timer is running, and SNR is not in the window between NESN and HSNR + 1 inclusive, a new Tq timer shall be started and the value of HSNR shall be updated. If at least one Tq timer is running, and SNR for this packet is equal to HSNR + 1, the value of HSNR shall be updated.

- (d) Release of packets to the XDCE. If a packet is received with a sequence number equal to NESN, the following procedure shall be applied—
 - (i) a) the packet and any packets already stored in the resequencing window up to the next missing sequence number shall be passed to the XDCE;
 - (ii) b) NESN shall be set to 1 + the value of the sequence number of the last packet passed to the XDCE; and
 - (iii) c) the Tq timer associated with any of the released packets shall be stopped.

- (e) Tq timer expiration. If a Tq timer expires, the following procedure shall be applied—
 - (i) NESN shall be incremented until the next missing sequence number is detected after that of the packet associated with the Tq timer that has expired
 - (ii) any stored packets with sequence numbers that are no longer in the resequencing window shall

be forwarded or not forwarded to the XDCE except that an incomplete S-bit sequence shall be discarded; and

- (iii) the Tq timer associated with any released packets shall be stopped.

30. Mode S specific services processing

- (1) Mode S specific services shall be processed in the XDLP by Mode S specific services entity (SSE) and transponder registers shall be used to convey the information specified in Table 3-24 of Schedule 3.
- (2) The data structuring of the registers in Table 3-24 of Schedule 3 shall be implemented in a way that ensures interoperability.

Note 1.— The data formats and protocols for messages transferred via Mode S specific services are specified in the Technical Provisions for Mode S Services and Extended Squitter (Doc 9871).

Note 2.— Uniform implementation of the data formats and protocols for messages transferred via Mode S specific services will ensure interoperability.

Note 3.— This section describes the processing of control and message data received from the Mode S specific services interface.

Note 4.— Control data consists of information permitting the determination of, for example, message length, BDS code used to access the data format for a particular register, and aircraft address.

31. Mode S ADLP processing

- (1) Downlink processing
 - (a) Specific services capability. The ADLP shall be capable of receiving control and message data from the Mode S specific services interface and sending delivery notices

to this interface. The control data shall be processed to determine the protocol type and the length of the message data. When the message or control data provided at this interface are erroneous (i.e. incomplete, invalid or inconsistent), the ADLP shall discard the message and deliver an error report at the interface.

Note. — *The diagnostic content and error reporting mechanism are a local issue.*

- (b) Broadcast processing. The control and message data shall be used to format the Comm-B broadcast message as specified in 33 and transferred to the transponder.
- (c) GICB processing. The 8-bit BDS code shall be determined from the control data. The 7-byte register content shall be extracted from the received message data. The register content shall be transferred to the transponder, along with an indication of the specified register number. A request to address one of the air-initiated Comm-B registers or the airborne collision avoidance system (ACAS) active resolution advisories register shall be discarded. The assignment of registers shall be as specified in Table 3-24 of Schedule 3.
- (d) MSP processing
 - (i) The MSP message length, channel number (M/CH) (paragraph 33(1)(c)) and optionally the interrogator identifier (II) code shall be determined from the control data. The MSP message content shall be extracted from the received message data. If the message length is 26 bytes or less, the SSE shall format an air-initiated Comm-B message (paragraph 31(1) (d)(ii)) for transfer to the transponder using the short form MSP packet (paragraph 33(1)). If the message length is 27 to 159 bytes and the transponder has adequate downlink ELM capability, the SSE shall format an ELM message for transfer using the short form

MSP packet. If the message length is 27 to 159 bytes and the transponder has a limited downlink ELM capability, the SSE shall format multiple long form MSP packets (paragraph 33(2)) using ELM messages, as required utilizing the L-bit and M/SN fields for association of the packets. If the message length is 27 to 159 bytes and the transponder does not have downlink ELM capability, the SSE shall format multiple long form MSP packets (paragraph 33(2)) using air initiated Comm-B messages, as required utilizing the L-bit and M/SN fields for association of the packets. Different frame types shall never be used in the delivery of an MSP message. Messages longer than 159 bytes shall be discarded. The assignment of downlink MSP channel numbers shall be as specified in Table 3-25 of Schedule 3.

- (ii) For an MSP, a request to send a packet shall cause the packet to be multisite-directed to the interrogator which II code is specified in control data. If no II code is specified, the packet shall be downlinked using the air-initiated protocol. A message delivery notice for this packet shall be provided to the Mode S specific interface when the corresponding close-out(s) have been received from the transponder. If a close-out has not been received from the transponder in Tz seconds, as specified in Table 3-1 of Schedule 3, the MSP packet shall be discarded. This shall include the cancellation in the transponder of any frames associated with this packet. A delivery failure notice for this message shall be provided to the Mode S specific services interface.

(2) Uplink processing

Note.— This section describes the processing of Mode S specific services messages received from the transponder.

- (a) Specific *services capability*. The ADLP shall be capable of receiving Mode S specific services messages from the transponder via frame processing. The ADLP shall be capable of delivering the messages and the associated control data at the specific services interface. When the resources allocated at this interface are insufficient to accommodate the output data, the ADLP shall discard the message and deliver an error report at this interface.
- (b) *Broadcast processing*. If the received message is a broadcast Comm-A, as indicated by control data received over the transponder/ADLP interface, the broadcast ID and user data (paragraph 35) shall be forwarded to the Mode S specific services interface along with the control data that identifies this as a broadcast message. The assignment of uplink broadcast identifier numbers shall be as specified in Table 3-23 of Schedule 3.
- (c) MSP processing. If the received message is an MSP, as indicated by the packet format header (paragraph 33), the user data field of the received MSP packet shall be forwarded to the Mode S specific services interface (paragraph 9(1)) together with the MSP channel number (M/CH), the IIS subfield (paragraph 4(1)(a)) together with control data that identifies this as an MSP message. L-bit processing shall be performed as specified in paragraph 34. The assignment of uplink MSP channel numbers shall be as specified in Table 3-25 of Schedule 3.

32. Mode S GDLP processing

(1) Uplink processing

- (a) The GDLP shall be capable of receiving control and message data from the Mode S specific services interfaces (paragraph 8(2)) and sending delivery notices to the interface(s). The control data shall be processed to determine the protocol type and the length of the message data.

- (b) The GDLP shall determine the interrogator(s), broadcast azimuths and scan times from the control data and format the broadcast message for transfer to the interrogator(s) as specified in paragraph 34.
 - (c) The GDLP shall determine the register number and the aircraft address from the control data. The aircraft address and BDS code shall be passed to the interrogator as a request for a ground-initiated Comm-B.
 - (d) The GDLP shall extract from the control data the message length, the MSP channel number (M/CH) and the aircraft address, and obtain the message content from the message data. If the message length is 27 bytes or less, the SSE shall format a Comm-A message for transfer to the interrogator using the short form MSP packet (paragraph 33(1)). If the message length is 28 to 151 bytes and the transponder has uplink ELM capability, the SSE shall format an ELM message for transfer to the interrogator using the short form MSP packet. If the message length is 28 to 151 bytes and the transponder does not have uplink ELM capability, the SSE shall format multiple long form MSP packets (paragraph 33(2)) utilizing the L-bit and the M/SN fields for association of the packets. Messages longer than 151 bytes shall be discarded. The interrogator shall provide a delivery notice to the Mode S specific services interface(s) indicating successful or unsuccessful delivery, for each uplinked packet.
- (2) Downlink processing
- (a) The GDLP shall be capable of receiving Mode S specific services messages from the interrogator via frame processing.
 - (b) If the received message is a broadcast Comm-B, as indicated by the interrogator/GDLP interface, the GDLP shall—

- (i) generate control data indicating the presence of a broadcast message and the 24-bit address of the aircraft from which the message was received;
 - (ii) append the 7-byte MB field of the broadcast Comm-B; and
 - (iii) forward this data to the Mode S specific services interfaces (paragraph 9(2)).
- (c) If the received message is a GICB, as indicated by the interrogator/GDLP interface, the GDLP shall:
- (i) generate control data indicating the presence of a GICB message, the register number and the 24-bit address of the aircraft from which the message was received;
 - (ii) append the 7-byte MB field of the GICB; and
 - (iii) forward this data to the Mode S specific services interfaces (paragraph 9(2)).
- (d) If the received message is an MSP as indicated by the packet format header (paragraph 33), the GDLP shall-
- (i) generate control data indicating the transfer of an MSP, the length of the message, the MSP channel number (M/CH) and the 24-bit address of the aircraft from which the message was received;
 - (ii) append the user data field of the received MSP packet; and
 - (iii) forward this data to the Mode S specific services interface(s) (paragraph 9(2)).

L-bit processing shall be performed as specified in paragraph 34.

33. MSP packet formats of Mode S services processing

- (1) Short form MSP packet. The format for this packet shall be as follows—

| | | | | |
|------|------|--------|--------------|------|
| DP:1 | MP:1 | M/CH:6 | FILL1:0 or 6 | UD:v |
|------|------|--------|--------------|------|

- (a) Data packet type (DP). This field shall be set to 0.
 - (b) MSP packet type (MP). This field shall be set to 0.
 - (c) MSP channel number (M/CH). The field shall be set to the channel number derived from the SSE control data.
 - (d) Fill field (FILL1:0 or 6). The fill length shall be 6 bits for a downlink SLM frame. Otherwise the fill length shall be 0.
 - (e) User data (UD). The user data field shall contain message data received from the Mode S specific services interface (paragraph 7(2)).
- (2) The format for the long form MSP packet shall be as follows—

| | | | | | | | |
|------|------|------|-----|--------|--------------|--------|------|
| DP:1 | MP:1 | SP:2 | L:1 | M/SN:3 | FILL2:0 or 2 | M/CH:6 | UD:v |
|------|------|------|-----|--------|--------------|--------|------|

Fields shown in the packet format and not specified in the following paragraphs shall be set as specified in paragraph 19(1) and paragraph 33(1).

- (3) *The data packet type (DP)* field shall be set to 0.
 - (a) MSP packet type (MP). This field shall be set to 1.
 - (b) Supervisory packet (SP). This field shall be set to 0.
 - (c) L field (L). A value of 1 shall indicate that the packet is part of an L-bit sequence with more packets in the sequence to follow. A value of 0 shall indicate that the sequence ends with this packet.
 - (d) *The MSP sequence number field (M/SN)* shall be used to detect duplication in the delivery of L-bit sequences. The first packet in an L-bit sequence shall be assigned a sequence number of 0. Subsequent packets shall be numbered sequentially. A packet received with the same sequence number as the previously received packet shall be discarded.

34. L-bit processing of Mode S services.

L-bit processing shall be performed only on the long form MSP packet and shall be performed as specified for M-bit processing (paragraph 17(1)) except as specified in the following paragraphs—

- (1) Upon receipt of a long form MSP packet, the XDLP shall construct the user data field by—
 - (a) verifying that the packet order is correct using the M/SN field (paragraph 33(2));
 - (b) assuming that the user data field in the MSP packet is the largest number of integral bytes that is contained within the frame;
 - (c) associating each user data field in an MSP packet received with a previous user data field in an MSP packet that has an L-bit value of 1; and

Note.— Truncation of the user data field is not permitted as this is treated as an error condition.

- (d) if an error is detected in the processing of an MSP packet, the packet shall be discarded.
- (2) In the processing of an L-bit sequence, the XDLP shall discard any MSP packets that have duplicate M/SN values. The XDLP shall discard the entire L-bit sequence if a long form MSP packet is determined to be missing by use of the M/SN field.
- (3) The packets associated with any L-bit sequence whose reassembly is not completed in T_m seconds (Tables 3-1 and 3-13 of Schedule 3) shall be discarded.

35. Broadcast format of Mode S specific services processing

- (1) In the case of uplink broadcast, the format of the broadcast Comm-A shall be as follows- The 83-bit uplink broadcast shall be inserted in an uplink Comm-A frame. The MA field of the Comm-A frame shall contain the broadcast identifier specified in Table 3-23 of Schedule 3 in the first 8 bits, followed by the first 48 user data bits of the broadcast message. The last 27 user

data bits of the broadcast message shall be placed in the 27 bits immediately following the UF field of the Comm-A frame.

- (2) In the case of downlink broadcast, the format of broadcast Comm-B shall be as follows- The 56-bit downlink broadcast message shall be inserted in the MB field of the broadcast Comm-B. The MB field shall contain the broadcast identifier specified in Table 3-23 of Schedule 3 in the first 8 bits, followed by the 48 user data bits.

Mode S Sub Network Management

36. Interrogator link determination function in Mode S sub network Management

Note.— The ADLP interrogator link determination function selects the II code of the Mode S interrogator through which a Mode S subnetwork packet may be routed to the desired destination ground DTE.

- (1) The ADLP shall construct and manage a Mode S interrogator-data terminal equipment (DTE) cross-reference table whose entries are Mode S interrogator identifier (II) codes and ground DTE addresses associated with the ground ATN routers or other ground DTEs. Each entry of the II code-DTE cross-reference table shall consist of the 4-bit Mode S II code and the 8-bit binary representation of the ground DTE.

Note 1.— Due to the requirement for non-ambiguous addresses, a DTE address also uniquely identifies a GDLP.

Note 2.— An ATN router may have more than one ground DTE address.

- (2) The following procedures shall be used—
 - (a) when the GDLP initially detects the presence of an aircraft, or detects contact with a currently acquired aircraft through an interrogator with a new II code, the appropriate fields of the DATA LINK CAPABILITY

report shall be examined to determine if, and to what level, the aircraft has the capability to participate in a data exchange. After positive determination of data link capability, the GDLP shall uplink one or more Mode S ROUTE packets as specified in paragraph 20(3). This information shall relate the Mode S II code with the ground DTE addresses accessible through that interrogator. The ADLP shall update the II code-DTE cross-reference table and then discard the Mode S ROUTE packet(s);

- (b) a II code-DTE cross-reference table entry shall be deleted when commanded by a Mode S ROUTE packet or when the ADLP recognizes that the transponder has not been selectively interrogated by a Mode S interrogator with a given II code for T_s seconds by monitoring the IIS subfield in Mode S surveillance or Comm-A interrogations (Table 3-1 of Schedule 3);
- (c) when the GDLP determines that modification is required to the Mode S interrogator assignment, it shall transfer one or more Mode S ROUTE packets to the ADLP. The update information contained in the Mode S ROUTE packet shall be used by the ADLP to modify its cross-reference table. Additions shall be processed before deletions;
- (d) when the GDLP sends the initial ROUTE packet after acquisition of a Mode S data link-equipped aircraft, the IN bit shall be set to ONE. This value shall cause the ADLP to perform the procedures as specified in paragraph 23(3) (c). Otherwise, the IN bit shall be set to ZERO;
- (e) when the ADLP is initialised (e.g. after a power-up procedure), the ADLP shall issue a search request by sending a broadcast Comm-B message with broadcast identifier equal to 255 (FF16, as specified in Table 3-23 of Schedule 3) and the remaining 6 bytes unused. On receipt of a search request, a GDLP shall respond with one or more Mode S ROUTE packets, clear all SVCs associated with the ADLP, as specified in paragraph

23(3), and discard the search request. This shall cause the ADLP to initialize the II code-DTE cross-reference table; and

- (f) on receipt of an update request (Table 3-23 of Schedule 3), a GDLP shall respond with one or more Mode S ROUTE packets and discard the update request. This shall cause the ADLP to update the II code-DTE cross-reference table.

Note.— The update request may be used by the ADLP under exceptional circumstances (e.g. changeover to standby unit) to verify the contents of its II code-DTE crossreference table.

(3) Procedures for downlinking Mode S packets

- (a) When the ADLP has a packet to downlink, the following procedures shall apply—
 - (i) If the packet to be transferred is a Mode S CALL REQUEST, the ground DTE address field shall be examined and shall be associated with a connected Mode S interrogator using the II code-DTE crossreference table. The packet shall be downlinked using the multisite-directed protocol. A request to transfer a packet to a DTE address not in the cross-reference table shall result in the action specified in paragraph 23(3)(a).
 - (ii) For an SVC, a request to send a packet to a ground DTE shall cause the packet to be multisite directed to the last Mode S interrogator used to successfully transfer (uplink or downlink) a packet to that DTE, provided that this Mode S interrogator is currently in the II code-DTE cross-reference table. Otherwise, an SVC packet shall be downlinked using the multisite-directed protocol to any other Mode S interrogator associated with the specified ground DTE address. Level 5 transponders shall be permitted to use

additional interrogators for downlink transfer as indicated in the II code-DTE cross-reference table.

- (b) A downlink frame transfer shall be defined to be successful if its Comm-B or ELM close-out is received from the transponder within T_z seconds as specified in Table 3-1 of Schedule 3. If the attempt is not successful and an SVC packet is to be sent, the II code-DTE cross-reference table shall be examined for another entry with the same called ground DTE address and a different Mode S II code. The procedure shall be retried using the multisite-directed protocol with the new Mode S interrogator. If there are no entries for the required called DTE, or all entries result in a failed attempt, a link failure shall be declared (paragraph 38(1)).

37. Support for the DTE(S) in Mode S sub network management

- (1) The GDLP shall notify the ground DTE(s) of the availability of a Mode S data link-equipped aircraft (“join event”). The GDLP shall also inform the ground DTEs when such an aircraft is no longer in contact via that GDLP (“leave event”). The GDLP shall provide for notification (on request) of all Mode S data link equipped aircraft currently in contact with that GDLP. The notifications shall provide the ground ATN router with the subnetwork point of attachment (SNPA) address of the mobile ATN router, with the position of the aircraft and quality of service as optional parameters. The SNPA of the mobile ATN router shall be the DTE address formed by the aircraft address and a sub-address of 0 (paragraph 8(3)(b)).
- (2) The ADLP shall notify all aircraft DTEs whenever the last remaining entry for a ground DTE is deleted from the II code-DTE cross-reference table (paragraph 36(1)). This notification shall include the address of this DTE.
- (3) The mechanism for communication of changes in sub network connectivity shall be a confirmed service, such as the join/leave events that allow notification of the connectivity status.

38. Error procedures in mode S sub network management

- (1) The failure to deliver a packet to the referenced XDLP after an attempt has been made to deliver this packet via all available interrogators shall be declared to be a link level failure. For an SVC, the XDCE shall enter the State p1 and release all resources associated with that channel. This shall include the cancellation in the transponder of any frames associated with this SVC. A Mode S CLEAR REQUEST packet shall be sent to the DCE via the reformatting process and shall be forwarded by the DCE as an ISO 8208 packet to the local DTE as described in paragraph 23(3). On the aircraft side, the channel shall not be returned to the ADCE channel pool, i.e. does not return to the State p1, until Tr seconds after the link failure has been declared (Table 3-1 of Schedule 3).
- (2) Active channel determination
 - (a) *Procedure for d1 State.* The XDLP shall monitor the activity of all SVCs, not in a READY State (p1). If an SVC is in the (XDCE) FLOW CONTROL READY State (d1) for more than Tx seconds (the active channel timer, Tables 3-1 and 3-13 of Schedule 3) without sending a Mode S RR, RNR, DATA, or REJECT packet, then—
 - (i) if the last packet sent was a Mode S REJECT packet to which a response has not been received, then the XDLP shall resend that packet; or
 - (ii) the XDLP shall send a Mode S RR or RNR packet as appropriate to the peer XDLP.
 - (b) *Procedure for other States.* If an XDCE SVC is in the p2, p3, p6, p7, d2 or d3 State for more than Tx seconds, the link failure procedure in paragraph 36(1)) shall be performed.
 - (c) Link failure shall be declared if either a failure to deliver, or a failure to receive, keep-alive packets has occurred. In which case the channel shall be cleared.

39. The data link capability report

The data link capability report shall be as specified in the Civil Aviation (Surveillance and Collision Avoidance System) Regulations 2019.

40. System timers

- (1) The values for timers shall conform to the values given in Tables 3-1 and 3-13 of Schedule 3.
- (2) Tolerance for all timers shall be plus or minus one per cent.
- (3) Resolution for all timers shall be one second.

41. System requirements

- (1) The maximum bit error rates for data presented at the ADLP/transponder interface or the GDLP/interrogator interface measured at the local DTE/XDLP interface (and vice versa) shall not exceed 10^{-9} for undetected errors and 10^{-7} for detected errors.

Note.— The maximum error rate includes all errors resulting from data transfers across the interfaces and from XDLP internal operation.

- (2) Timing
 - (a) ADLP operations shall not take longer than 0.25 seconds for regular traffic and 0.125 seconds for interrupt traffic. This interval shall be defined as follows—
 - (i) for transponders with downlink ELM capability: the time that the final bit of a 128-byte data packet is presented to the DCE for downlink transfer to the time that the final bit of the first encapsulating frame is available for delivery to the transponder;
 - (ii) for transponders with Comm-B capability: the time that the final bit of a user data field of 24 bytes is presented to the DCE for downlink transfer to the time that the final bit of the last of the four Comm-B segments that forms the frame

encapsulating the user data is available for delivery to the transponder;

- (iii) for transponders with uplink ELM capability: the time that the final bit of the last segment of an ELM of 14 Comm-C segments that contains a user data field of 128 bytes is received by the ADLP to the time that the final bit of the corresponding packet is available for delivery to the DTE;
 - (iv) for transponders with Comm-A capability: the time that the final bit of the last segment of four linked Comm-A segments that contains a user data field of 25 bytes is received by the ADLP to the time that the final bit of the corresponding packet is available for delivery to the DTE;
- (b) The total time delay across the GDLP, exclusive of transmission delay, shall not be greater than 0.125 seconds.
 - (c) The physical interface between the ADLP and the transponder shall have a minimum bit rate of 100 kilobits per second.

SCHEDULE 3

Regulation 48(b)

DCE AND XDCE STATE TABLES

1. State table requirements.

The DCE and XDCE shall function as specified in Tables 3-1 to 3-18. State tables 3-11 through 3-18 shall be applied to—

- (a) ADLP state transitions when the XDCE or XDLP terms in parenthesis are omitted; and
- (b) GDLP state transitions when the terms in parenthesis are used and the XDCE or XDLP preceding them are omitted.

2. *Diagnostic and cause codes.* The table entries for certain conditions indicate a diagnostic code that shall be included in the packet generated when entering Uganda. The term, “*D = ,*” shall define the diagnostic code. When “*A = DIAG*”, the action taken shall be to generate an ISO 8208 DIAGNOSTIC packet and transfer it to the DTE; the diagnostic code indicated shall define the entry in the diagnostic field of the packet. The cause field shall be set as specified in paragraph 21(3) of Schedule 2. The reset cause field shall be set as specified in ISO 8208.

Note 1.— The tables provided below specify the authority’s requirements in the following order-

3-1 DCE special cases

3-2 DTE effect on DCE restart States

3-3 DTE effect on DCE call setup and clearing States

3-4 DTE effect on DCE reset States

3-5 DTE effect on DCE interrupt transfer States

3-6 DTE effect on DCE flow control transfer States

3-7 XDCE effect on DCE restart States

3-8 XDCE effect on DCE call setup and clearing States

3-9 XDCE effect on DCE reset States

3-10 XDCE effect on DCE interrupt transfer States

3-11 GDLP (ADLP) effect on ADCE (GDCE) packet layer ready States

3-12 GDLP (ADLP) effect on ADCE (GDCE) call setup and clearing States

3-13 GDLP (ADLP) effect on ADCE (GDCE) reset States

- 3-14 GDLP (ADLP) effect on ADCE (GDCE) interrupt transfer States
- 3-15 GDLP (ADLP) effect on ADCE (GDCE) flow control transfer States
- 3-16 DCE effect on ADCE (GDCE) call setup and clearing States
- 3-17 DCE effect on ADCE (GDCE) reset States
- 3-18 DCE effect on ADCE (GDCE) interrupt transfer States

Note 2.— All tables specify both ADLP and GDLP actions.

Note 3. — Within the Mode S subnetwork, States p6 and d2 are transient States.

Note 4. — References to “notes” in the State tables refer to table-specific notes that follow each State table.

Note 5. — All diagnostic and cause codes are interpreted as decimal numbers.

Note 6. — An SVC between an ADCE and a GDCE may be identified by a temporary or permanent channel number, as defined in Schedule 2.

TABLES

Table 3-1. ADLP Mode S subnetwork timers

| <i>Timer name</i> | <i>Timer label</i> | <i>Nominal value</i> | <i>Reference</i> |
|--|--------------------|----------------------|------------------------------|
| Channel retirement | <i>Tr</i> | 600 s | 38(1) |
| Active channel-ADLP | <i>Tx</i> | 420 s | 38(2) |
| Interrogator interrogation | <i>Ts</i> | 60 s | 36(2) |
| Interrogator link | <i>Tz</i> | 30 s | 31(1)(d)(ii), (36) (3)(b) |
| Link frame cancellation | <i>Tc</i> | 60 s | (2)(3)(b)(v) |
| L-bit delivery-ADLP | <i>Tm</i> | 120 s | 34(3) |
| Packet resequencing and S-bit delivery | <i>Tq</i> | 60 s | 29(5)(e) |

Table 3-2 DCE Actions at state transition

| <i>DCE state</i> | <i>State definition</i> | <i>Action that shall be taken when entering the state</i> |
|------------------|--------------------------|---|
| <i>r1</i> | PACKET LEVEL READY | Return all SVCs to the <i>p1</i> state (see <i>p1</i> state explanation). |
| <i>r2</i> | DTE RESTART REQUEST | Return each SVC to the <i>p1</i> state (see <i>p1</i> state explanation). Issue a RESTART CONFIRMATION to the DTE. |
| <i>r3</i> | DCE RESTART REQUEST | Issue a RESTART REQUEST to the DTE. Unless entered via the <i>r2</i> state, send a RESTART REQUEST to the reformatting process. |
| <i>p1</i> | READY | Release all resources assigned to SVC. Break the correspondence between the DTE/DCE SVC and the ADCE/GDCE SVC (the ADCE/GDCE SVC may not yet be in the <i>p1</i> state). |
| <i>p2</i> | DTE CALL REQUEST | Determine if sufficient resources exist to support request; if so, allocate resources and forward CALL REQUEST packet to reformatting process; if not, enter DCE CLEAR REQUEST to DTE state (<i>p7</i>). Determination of resources and allocation is as defined in ISO 8208. |
| <i>p3</i> | DCE CALL REQUEST | Determine if sufficient resources exist to support request; if so allocate resources and forward CALL REQUEST packet to DTE; if not, send a CLEAR REQUEST packet to the reformatting process. Determination of resources and allocation is as defined in ISO 8208. |
| <i>p4</i> | DATA TRANSFER | No action. |
| <i>p5</i> | CALL COLLISION | Reassign outgoing call to another SVC (the DTE in its call collision state ignores the incoming call) and enter the DCE CALL REQUEST state (<i>p3</i>) for that new SVC. Enter the <i>p2</i> state to process the CALL REQUEST from the DTE. |
| <i>p6</i> | DTE CLEAR REQUEST | Release all resources assigned to SVC, send a CLEAR CONFIRMATION packet to the DTE and enter <i>p1</i> state. |
| <i>p7</i> | DCE CLEAR REQUEST to DTE | Forward CLEAR REQUEST packet to DTE. |
| <i>d1</i> | FLOW CONTROL READY | No action. |
| <i>d2</i> | DTE RESET REQUEST | Remove DATA packets transmitted to DTE from window; discard any DATA packets that represent partially transmitted M-bit sequences and discard any INTERRUPT packet awaiting transfer to the DTE; reset all window counters to 0; set any timers and retransmission parameters relating to DATA and INTERRUPT transfer to their initial value. Send RESET CONFIRMATION packet to DTE. Return SVC to <i>d1</i> state. |

| | | |
|----|--------------------------|---|
| | | Remove DATA packets transmitted to DTE from window; discard any DATA packets that represent partially transmitted M-bit sequences and discard any INTERRUPT packet awaiting |
| d3 | DCE RESET REQUEST to DTE | Transfer to the DTE; reset all window counters to 0; set any timers and retransmission parameters relating to DATA and INTERRUPT transfer to their initial value. Forward RESET REQUEST PACKET DTE. |
| i1 | DTE INTERRUPT READY | No action. |
| i2 | DTE INTERRUPT SENT | Forward INTERRUPT packet received from DTE to reformatting process. |
| j1 | DCE INTERRUPT READY | No action |
| j2 | DCE INTERRUPT SENT | Forward INTERRUPT packet received from reformatting process to DTE. |
| f1 | DCE RECEIVE READY | No action. |
| f2 | DCE RECEIVE NOT READY | No action. |
| g1 | DTE RECEIVE READY | No action |
| g2 | DTE RECEIVE NOT READY | No action |

Table 3-3. DCE special cases

| <i>Received from DTE</i> | <i>DCE special cases Any state</i> |
|---|--|
| Any packet less than 2 bytes in length (including a valid data link level frame containing no packet) | A=DIAG D=38 |
| Any packet with an invalid general format identifier | A=DIAG D=40 |
| Any packet with a valid general format identifier and an assigned logical channel identifier (includes a logical channel identifier of 0) | See Table 3-4 |

Table 3-4 DTE effect on DCE restart states

| | DCE restart states (see Note 5) | | |
|---|--|--|---|
| | PACKET LEVEL READY (see Note 1) <i>r1</i> | DTE RESTART REQUEST <i>r2</i> | DCE RESTART REQUEST <i>r3</i> |
| Packet received from DTE | | | |
| Packets having a packet type identifier shorter than 1 byte and logical channel identifier not equal to 0 | See Table 3-5 | <i>A=ERROR</i> <i>S=r3</i> <i>D=38</i> (see Note 4) | <i>A=DISCARD</i> |
| Any packet, except RESTART, REGISTRATION (if supported) with a logical channel identifier of 0 | <i>A=DIAG</i> <i>D=36</i> See Table 3-5 | <i>A=DIAG</i> <i>D=36</i> <i>A=ERROR</i> | <i>A=DIAG</i> <i>D=36</i> <i>A=DISCARD</i> |
| Packet with a packet type identifier which is undefined or not supported by DCE | | <i>S=r3</i> <i>D=33</i> (see Note 4) | |
| RESTART REQUEST, RESTART CONFIRMATION, or REGISTRATION (if supported) packet with a logical channel identifier unequal to 0 | See Table 3-5 | <i>A=ERROR</i> <i>S=r3</i> <i>D=41</i> (see Note 4) | <i>A=DISCARD</i> |
| RESTART REQUEST | <i>A=NORMAL</i> (forward) <i>S=r2</i> | <i>A=DISCARD</i> | <i>A=NORMAL</i> <i>S=p1</i> or <i>d1</i> (see Note 2) |
| RESTART CONFIRMATION | <i>A=ERROR</i> <i>S=r3</i> <i>D=17</i> (see Note 6) | <i>A=ERROR</i> <i>S=r3</i> <i>D=18</i> (see Note 4) | <i>A=NORMAL</i> <i>S=p1</i> or <i>d1</i> (see Note 2) |
| RESTART REQUEST OR RESTART CONFIRMATION packet with a format error | <i>A=DIAG</i> <i>D=38, 39, 81</i> or <i>82</i> | <i>A=DISCARD</i> | <i>A=ERROR</i> <i>D=38, 39, 81</i> or <i>82</i> |
| REGISTRATION REQUEST or REGISTRATION CONFIRMATION packets (see Note 3) | <i>A=NORMAL</i> | <i>A=NORMAL</i> | <i>A=NORMAL</i> |
| REGISTRATION REQUEST or REGISTRATION | <i>A=DIAG</i> | <i>A=ERROR</i> | <i>A=ERROR</i> |

| | | | |
|---|-------------------------|---|----------------------|
| CONFIRMATION packet with a format error (see Note 3) | $D=38, 39, 81$ or 82 | $S=r3$ $D=38, 39, 81$ or 82 (see Note 4) | $D=38, 39, 81$ or 82 |
| Call setup, call clearing, DATA, interrupt, flow control, or reset packet | See Table 3-5 | $A=ERROR$ $S=r3$ $D=18$ | $A=DISCARD$ |

NOTES:

1. The Mode S subnetwork has no restart states. Receipt of a RESTART REQUEST causes the DCE to respond with a RESTART CONFIRMATION. The RESTART REQUEST packet is forwarded to the reformatting process, which issues clear requests for all SVCs associated with the DTE. The DCE enters the r3 state only as a result of an error detected on the DTE/DCE interface.
2. The SVC channels are returned to state p1, the permanent virtual circuits (PVC) channels are returned to state d1.
3. The use of the registration facility is optional on the DTE/DCE interface
4. No action is taken within the Mode S subnetwork
5. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared for the XDLF buffers, and INVALID indicates that the packet/state combination cannot occur
6. The error procedure consists of entering the r3 state, and sending a RESTART REQUEST to the reformatting process.

Table 3-5. DTE effect on DCE call setup and clearing states

| DCE call setup and clearing states (see Note 5) | | | | | | | |
|---|---|---|---|---------------|---|---|--------------------------|
| READY | Packet received from | CALL | | | | | |
| | | DTE CALL REQUEST | DCE CALL REQUEST | DATA TRANSFER | COLLISION | DCE CLEAR REQUEST | DCE CLEAR REQUEST to DTE |
| p1 | DTE | p2 | p3 | p4 | p5 (see Notes 1 and 4) | p6 | p7 |
| $A=ERROR$ $S=p7$ $D=38$ | Packets having a packet type identifier shorter than 1 byte | $A=ERROR$ $S=p7$ $D=38$ (see Note 2) | $A=ERROR$ $S=p7$ $D=38$ (see Note 2) | See Table 3-6 | $A=ERROR$ $S=p7$ $D=38$ (see Note 2) | $A=ERROR$ $S=p7$ $D=38$ (see Note 2) | $A=DISCARD$ |
| $A=ERROR$ | Packets having a packet | $A=ERROR$ | $A=ERROR$ | See Table 3-6 | $A=ERROR$ | $A=ERROR$ | $A=DISCARD$ |

| | | | | | | | |
|---|--|--|---|--|--|--|--|
| <i>S=p7</i> <i>D=33</i> | type identifier which is undefined or not supported by DCE | <i>S=p7</i> <i>D=33</i> | <i>S=p7</i> <i>D=33</i> | | <i>S=p7</i> <i>D=33</i> | <i>S=p7</i> <i>D=33</i> | |
| | | (see Note 2) | (see Note 2) | | (see Note 2) | (see Note 2) | |
| <i>A=ERROR</i> | RESTART REQUEST, | <i>A=ERROR</i> | <i>A=ERROR</i> | See Table 3-6 | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=DISCARD</i> |
| <i>S=p7</i> <i>D=41</i> | RESTART CONFIRMATION or REGISTRATION packet with logical channel identifier unequal to 0 | <i>S=p7</i> <i>D=41</i> | <i>S=p7</i> <i>D=41</i> | | <i>S=p7</i> <i>D=41</i> | <i>S=p7</i> <i>D=41</i> | |
| | | (see Note 2) | (see Note 2) | | (see Note 2) | (see Note 2) | |
| <i>A=NORMAL</i> <i>S=p2</i> (forward) | CALL REQUEST | <i>A=ERROR</i> <i>S=p7</i> <i>D=21</i> | <i>A=NORMAL</i> <i>S=p5</i> | <i>A=ERROR</i> <i>S=p7</i> <i>D=23</i> | <i>A=ERROR</i> <i>S=p7</i> <i>D=24</i> | <i>A=ERROR</i> <i>S=p7</i> <i>D=25</i> | <i>A=DISCARD</i> |
| | | (see Note 2) | | (see Note 2) | (see Note 2) | (see Note 2) | |
| <i>A=ERROR</i> | CALL ACCEPT | <i>A=ERROR</i> | <i>A=NORMAL</i> | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=DISCARD</i> |
| <i>S=p7</i> <i>D=20</i> | | <i>S=p7</i> <i>D=21</i> | <i>S=p4</i> (Forward) | <i>S=p7</i> <i>D=23</i> | <i>S=p7</i> <i>D=24</i> | <i>S=p7</i> <i>D=25</i> | |
| | | (see Note 2) | or <i>A=ERROR</i> | (see Note 2) | (see Notes 2 and 4) | (see Note 2) | |
| | | | <i>S=p7</i> <i>D=42</i> | | | | |
| | | | (see Notes 2 and 3) | | | | |
| <i>A=NORMAL</i> <i>S=p6</i> | CLEAR REQUEST | <i>A=NORMAL</i> <i>S=p6</i> (forward) | <i>A=NORMAL</i> <i>S=p6</i> (forward) | <i>A=NORMAL</i> <i>S=p6</i> (forward) | <i>A=NORMAL</i> <i>S=p6</i> (forward) | <i>A=DISCARD</i> | <i>A=NORMAL</i> <i>S=p1</i> (do not forward) |
| <i>A=ERROR</i> | CLEAR | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=NORMAL</i> |
| <i>S=p7</i> <i>D=20</i> | CONFIRMATION | <i>S=p7</i> <i>D=21</i> | <i>S=p7</i> <i>D=22</i> | <i>S=p7</i> <i>D=23</i> | <i>S=p7</i> <i>D=24</i> | <i>S=p7</i> <i>D=25</i> | <i>S=p1</i> (do not forward) |
| | | (see Note 2) | (see Note 2) | (see Note 2) | (see Note 2) | (see Note 2) | |
| <i>A=ERROR</i> | DATA, interrupt, flow control or reset packets | <i>A=ERROR</i> | <i>A=ERROR</i> | See Table 3-6 | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=DISCARD</i> |
| <i>S=p7</i> <i>D=20</i> | | <i>S=p7</i> <i>D=21</i> | <i>S=p7</i> <i>D=22</i> | | <i>S=p7</i> <i>D=24</i> | <i>S=p7</i> <i>D=25</i> | |
| | | (see Note 2) | (see Note 2) | | (see Note 2) | (see Note 2) | |

| | |
|--|-----------|
| DCE call setup and clearing states (see Note 5) | |
| CALL | |
| COLLISION | DCE CLEAR |

| | | | | | | | |
|--------------------------|-------------|------------------------|------------------------|---------------------|---------------------------|-------------------------|----------------------|
| Packet received from DTE | READY p1 | DTE CALL REQUEST p2 | DCE CALL REQUEST p3 | DATA TRANSFER p4 | p5 (see Notes 1 and 4) | DTE CLEAR REQUEST p6 | REQUEST to DTE p7 |
|--------------------------|-------------|------------------------|------------------------|---------------------|---------------------------|-------------------------|----------------------|

NOTES:

1. On entering the p5 state, the DCE reassigns the outgoing call to the DTE to another channel (no CLEAR REQUEST is issued) and responds to incoming DTE call as appropriate with a CLEAR REQUEST or CALL ACCEPT packet.
2. The error procedure consists of performing the actions specified when entering the p7 state (including sending a CLEAR REQUEST packet to the DTE) and additionally sending a CLEAR REQUEST packet to the XDCE (via the reformatting process).
3. The use of the fast select facility with a restriction on the response prohibits the DTE from sending a CALL ACCEPT packet
4. The DTE in the event of a call collision must discard the CALL REQUEST packet received from the DC.
5. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.

Table 3-6 DTE effect on DCE reset states

| Packet received from DTE | DCE reset states (see Note 2) | | |
|---|---|-------------------------------|-----------------------------------|
| | FLOW CONTROL RESET REQUEST READY d1 | RESET REQUEST by DTE d2 | DCE RESET REQUEST to DTE d3 |
| Packet with a packet type identifier shorter than 1 byte | A=ERROR S=d3 D=38 | A=ERROR S=d3 D=38 | A=DISCARD |
| Packet with a packet type identifier which is undefined or not supported by DCE | A=ERROR S=d3 D=33 | A=ERROR S=d3 D=33 | A=DISCARD |
| RESTART REQUEST, RESTART CONFIRMATION, or REGISTRATION (if supported) packet with logical channel identifier unequal to 0 | A=ERROR S=d3 D=41 | A=ERROR S=d3 D=41 | A=DISCARD |
| RESET | A=NORMAL | A=DISCARD | A=NORMAL |

| | | | |
|--|---------------------|------------------|----------------------------|
| REQUEST | $S=d2$ (forward) | | $S=d1$ (do not forward) |
| RESET CONFIRMATION | $A=ERROR$ | $A=ERROR$ | $A=NORMAL$ |
| | $S=d3$ $D=27$ | $S=d3$ $D=28$ | $S=d1$ (do not forward) |
| INTERRUPT packet | See Table 3-7 | $A=ERROR$ | $A=DISCARD$ |
| | | $S=d3$ $D=28$ | |
| INTERRUPT CONFIRMATION packet | See Table 3-7 | $A=ERROR$ | $A=DISCARD$ |
| | | $S=d3$ $D=28$ | |
| DATA or flow control packet | See Table 3-8 | $A=ERROR$ | $A=DISCARD$ |
| | | $S=d3$ $D=28$ | |
| REJECT supported but not subscribed to | $A=ERROR$ | $A=ERROR$ | $A=DISCARD$ |
| | $S=d3$ $D=37$ | $S=d3$ $D=37$ | |

NOTES:

The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the DTE) and sending a RESET REQUEST packet to the XDCE (via the formatting function).

Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared for the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur

Table 3-7 DTE effect on DCE interrupt transfer states

| | | |
|--------------------------|--|-----------------------|
| | DTE/DCE interrupt transfer states (see Note 2) | |
| | DTE INTERRUPT READY | DTE INTERRUPT SENT |
| Packet received from DTE | $i1$ | $i2$ |

| | | |
|---------------------------|---|--|
| INTERRUPT (see Note 1) | <i>A=NORMAL</i> <i>S=i2</i> (forward) | <i>A=ERROR</i> <i>S=d3</i> <i>D=44</i> (see Note 3) |
|---------------------------|---|--|

| | | |
|-----------------------------|--|-----------------------|
| Packet received from DTE | DTE/DCE interrupt transfer states (see Note 2) | |
| | DCE INTERRUPT READY | DCE INTERRUPT SENT |
| | <i>j1</i> | <i>j2</i> |

| | | |
|---|--|---|
| INTERRUPT CONFIRMATION (see Note 1) | <i>A=ERROR</i> <i>S=d3</i> <i>D=43</i> (see Note 3) | <i>A=NORMAL</i> <i>S=j1</i> (forward) |
|---|--|---|

NOTES:

1. If the packet has a format error, then the error procedure applies (see Note 3). Interrupt packets with user data greater than 32 bytes should be treated as a format error.
2. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.
3. The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the DTE) and sending a RESET REQUEST packet to the XDCE (via the reformatting process).

Table 3-8 DTE effect on DCE flow control transfer states

| | | |
|---|--|---------------------------------------|
| Packet received from DTE | DCE flow control transfer states (see Notes 2 and 3) | |
| | DCE RECEIVE READY <i>f1</i> | DCE RECEIVE NOT READY <i>f2</i> |
| DATA packet with less than 4 bytes when using modulo 128 numbering | <i>A=ERROR</i> <i>S=d3</i> <i>D=38</i> (see Note 4) | <i>A=DISCARD</i> |
| DATA packet with invalid PR | <i>A=ERROR</i> <i>S=d3</i> | <i>A=ERROR</i> <i>S=d3</i> |

| | | |
|--|--|----------------------------------|
| DATA packet with valid PR but invalid PS or user data field with improper format | $D=2$ (see Note 4) | $D=2$ (see Note 4) |
| | $A=ERROR$ | $A=DISCARD$ |
| | $S=d3$ | (process PR data) |
| | $D=1$ (invalid PS) $D=39$ (UD > max negotiated length) $D=82$ (UD unaligned) (see Note 4) | |
| DATA packet with valid PR with M-bit set to 1 when the user data field is partially full | $A=ERROR$ | $A=DISCARD$ |
| | $S=d3$ | (process PR data) |
| | $D=165$ (see Note 4) | |
| DATA packet with valid PR, PS and user data field format | $A=NORMAL$ (forward) | $A=DISCARD$ (process PR data) |
| Packet received from DTE | DCE flow control transfer states (see Notes 2 and 3) | |
| | DTE RECEIVE READY $g1$ | DTE RECEIVE NOT READY $g2$ |
| RR, RNR, or REJECT packet with less than 3 bytes when using modulo 128 numbering (see Note 1) | $A=DISCARD$ | $A=DISCARD$ |
| RR, RNR, or REJECT packet with an invalid PR | $A=ERROR$ | $A=ERROR$ |
| | $S=d3$ | $S=d3$ |
| | $D=2$ (see Note 4) | $D=2$ (see Note 4) |
| RR packet with a valid PR | $A=NORMAL$ | $A=NORMAL$ $S=g1$ |
| RNR packet with a valid PR | $A=NORMAL$ $S=g2$ | $A=NORMAL$ |
| REJECT packet with a valid PR | $A=NORMAL$ | $A=NORMAL$ $S=g1$ |

NOTES:

1. The reject procedures are not required.

2. The RR, RNR and REJECT procedures are a local DTE/DCE matter and the corresponding packets are not forwarded to the XDCE.
3. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.
4. The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the DTE) and sending a RESET REQUEST packet to the XDCE (via the reformatting process).

Table 3-9. XDCE effect on DCE restart states

| | | DCE restart states (see Note) | |
|---|-----------------|---|---|
| | PACKET LEVEL | DTE RESTART REQUEST | DCE RESTART REQUEST |
| | READY | r2 | r3 |
| Packet received from XDCE | r1 | | |
| CALL REQUEST | See Table 3-10 | Send CLEAR REQUEST to reformatting process with D=244 | Send CLEAR REQUEST to reformatting process with D=244 |
| CALL ACCEPT, CLEAR REQUEST, DATA, INTERRUPT, INTERRUPT CONFIRMATION, RESET REQUEST | See Table 3-10 | A=DISCARD | A=DISCARD |

Note.— Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.

Table 3-10. XDCE effect on DCE call setup and clearing states

| Packet received from XDCE | DCE call setup and clearing states (see Note) | | | | | | |
|--|---|---|---|---|--------------------------------|--------------------------------------|---|
| | READY <i>p1</i> | DTE CALL REQUEST <i>p2</i> | DCE CALL REQUEST <i>p3</i> | DATA TRANSFER <i>p4</i> | CALL COLLISION <i>p5</i> | DTE CLEAR REQUEST <i>p6</i> | DCE CLEAR REQUEST to DTE <i>p7</i> |
| CALL REQUEST | <i>A=NORMAL</i> <i>S=p3</i> (forward) | INVALID | INVALID | INVALID | INVALID | INVALID | INVALID |
| CALL ACCEPT | <i>A=DISCARD</i> | <i>A=NORMAL</i> <i>S=p4</i> (forward) | INVALID | INVALID | INVALID | <i>A=DISCARD</i> | <i>A=DISCARD</i> |
| CLEAR REQUEST | <i>A=DISCARD</i> | <i>A=NORMAL</i> <i>S=p7</i> (forward) | <i>A=NORMAL</i> <i>S=p7</i> (forward) | <i>A=NORMAL</i> <i>S=p7</i> (forward) | INVALID | <i>A=DISCARD</i> | <i>A=DISCARD</i> |
| DATA, INTERRUPT, INTERRUPT CONFIRMATION, or RESET REQUEST | <i>A=DISCARD</i> | INVALID | INVALID | See Table 3-11 | INVALID | <i>A=DISCARD</i> | <i>A=DISCARD</i> |

Note.— Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.

Table 3-11 XDCE effect on DCE

| Packet received from XDCE | DCE reset states (see Note) | | |
|---------------------------|---|---|---|
| | FLOW CON- TROL READY <i>d1</i> | DTE RESET REQUEST <i>d2</i> | DCE RESET REQUEST to DTE <i>d3</i> |
| RESET REQUEST | <i>A=NORMAL</i> <i>S=d3</i> (forward) | <i>A=NORMAL</i> <i>S=d1</i> (forward) | <i>A=DISCARD</i> |
| INTERRUPT | See Table 3-12 | <i>A=DISCARD</i> | <i>A=DISCARD</i> |
| INTERRUPT CONFIRMATION | See Table 3-12 | <i>A=DISCARD</i> | INVALID |
| DATA | <i>A=NORMAL</i> (forward) | <i>A=DISCARD</i> | <i>A=DISCARD</i> |

Note.— Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.

Table 3-12 XDCE effect on DCE interrupt transfer states

| | | |
|---------------------------|---|---|
| | DCE interrupt transfer states (see Note) | |
| | DTE INTERRUPT READY | DTE INTERRUPT SENT |
| Packet received from XDCE | <i>i1</i> | <i>i2</i> |
| INTERRUPT CONFIRMATION | INVALID | <i>A=NORMAL</i> <i>S=i1</i> (forward) |
| | DCE interrupt transfer states (see Note) | |
| | DCE INTERRUPT READY | DCE INTERRUPT SENT |
| Packet received from XDCE | <i>j1</i> | <i>j2</i> |
| INTERRUPT | <i>A=NORMAL</i> <i>S=j2</i> (forward) | INVALID |

Note.— Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.

Table 3-13. GDLP Mode S subnetwork timers

| Timer name | Timer label | Nominal value | Reference |
|--|-------------|---------------|--------------------|
| Active channel-GDLP | <i>Tx</i> | 300 s | Paragraph 38(3) |
| L-bit delivery-GDLP | <i>Tm</i> | 120 s | Paragraph 34(3) |
| Packet resequencing and S-bit delivery | <i>Tq</i> | 60 s | Paragraph 29(5)(e) |

Table 3-14. XDCE actions at state transition

| <i>XDCE state</i> | <i>State definition</i> | <i>Action that shall be taken when entering the state</i> |
|-------------------|---|---|
| <i>r1</i> | PACKET LEVEL READY | Return all SVCs to the <i>p1</i> state. |
| <i>p1</i> | READY | Release all resources assigned to the SVC. Break the correspondence between the ADCE/GDCE SVC and the DTE/DCE SVC (the DTE/DCE SVC may not yet be in a <i>p1</i> state). |
| <i>p2</i> | GDLP(ADLP) CALL REQUEST | Determine if sufficient resources exist to support request; if so allocate resources and forward Mode S CALL REQUEST packet to reformatting process; if not, enter ADCE(GDCE) CLEAR REQUEST to GDLP(ADLP) state (<i>p7</i>). |
| <i>p3</i> | ADCE(GDCE) CALL REQUEST | Determine if sufficient resources exist to support request; if so, allocate resources and forward Mode S CALL REQUEST packet to frame processing; if not, send Mode S CLEAR REQUEST to reformatting process and go to state <i>p1</i> . Do not forward the Mode S CALL REQUEST to the peer XDCE. |
| <i>p4</i> | DATA TRANSFER | No action. |
| <i>p6</i> | GDLP(ADLP) CLEAR REQUEST | Release all resources, send a Mode S CLEAR CONFIRMATION packet to the peer XDCE and enter the <i>p1</i> state. |
| <i>p7</i> | ADCE(GDCE) CLEAR REQUEST to GDLP(ADLP) | Forward Mode S CLEAR REQUEST packet to the peer XDCE via frame processing. |
| <i>d1</i> | FLOW CONTROL READY | No action. |

| | | |
|-----------|---|--|
| <i>d2</i> | GDLP(ADLP) RESET REQUEST | Remove Mode S DATA packets transmitted to peer XDCE from window; discard any DATA packets that represent partially transmitted M-bit sequences and discard any Mode S INTERRUPT packets awaiting transfer to the peer XDCE; reset all flow control window counters to 0. Send Mode S RESET CONFIRMATION packet to the peer XDCE. Return SVC to <i>d1</i> state. Forward Mode S RESET REQUEST packet to reformatting process. |
| <i>d3</i> | ADCE(GDCE) RESET REQUEST to GDLP(ADLP) | Remove Mode S DATA packets transmitted to peer XDCE from window; discard any DATA packets that represent partially transmitted M-bit sequences and discard any Mode S INTERRUPT packets awaiting transfer to the peer XDCE; reset all flow control window counters to 0. Forward Mode S RESET REQUEST packet to peer XDCE via frame processing. |
| <i>i1</i> | GDLP(ADLP) INTERRUPT READY | No action. |
| <i>i2</i> | GDLP(ADLP) INTERRUPT SENT | Forward Mode S INTERRUPT packet received from peer XDCE to the reformatting process. |
| <i>j1</i> | ADCE(GDCE) INTERRUPT READY | No action. |
| <i>j2</i> | ADCE(GDCE) INTERRUPT SENT | Forward Mode S INTERRUPT packet received from the reformatting process. |
| <i>f1</i> | ADCE(GDCE) RECEIVE READY | No action. |
| <i>f2</i> | ADCE(GDCE) RECEIVE NOT READY | No action. |
| <i>g1</i> | GDLP(ADLP) RECEIVE READY | No action. |
| <i>g2</i> | GDLP(ADLP) RECEIVE NOT READY | No action. |

Table 3-15. GDLP (ADLP) effect on ADCE (GDCE) packet layer ready states

| | |
|--|--|
| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) states (see Notes 1 and 3) PACKET LEVEL READY <i>r1</i> |
| CH=0 with no TC present (see Note 4) or | <i>A=DISCARD</i> |
| CH=0 in a CALL ACCEPT by ADLP packet | |
| Unassigned packet header | <i>A=DISCARD</i> |
| Call setup, call clearing, DATA, interrupt, flow control, or reset | |

NOTES:

1. *The XDCE state is not necessarily the same state as the DTE/DCE interface.*
2. *All packets from the peer XDLP have been checked for duplication before evaluation as represented by this table.*
3. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
4. *Where CH=0 and a valid TC is present in a CLEAR REQUEST by ADLP or GDLP packet or a CLEAR CONFIRMATION by ADLP or GDLP packet, it is handled as described in paragraph 15(2) and Table 3-16.*

Table 3-16 GDLP (ADLP) effect on ADCE (GDCE) call setup and clearing states

| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) call setup and clearing States (See Notes 1, 7 and 8) | | | | | |
|---|---|------------------------------------|------------------|-------------------------------------|---|--|
| | GDLP (ADLP) CALL REQUEST | ADCE (GDCE) CALL REQUEST | DATA TRANSFER | GDLP (ADLP) CLEAR REQUEST | ADCE (GDCE) CLEAR REQUEST to GDLP (ADLP) | |
| READY <i>p1</i> | <i>p2</i> | <i>p3</i> | <i>p4</i> | <i>p6</i> | <i>p7</i> | |

| | | | | | | |
|------------------------------|--|--|---|--|--|------------------|
| Format error (see Note 3) | <i>A=ERROR</i> (see Note 10) <i>S=p7</i> <i>D=33</i> (see Note 9) | <i>A=ERROR</i> <i>S=p7</i> <i>D=33</i> (see Note 6) | <i>A=ERROR</i> <i>S=p7</i> <i>D=33</i> (see Notes 6 and 9) | See Table 5-17 | <i>A=ERROR</i> <i>S=p7</i> <i>D=25</i> (see Note 6) | <i>A=DISCARD</i> |
| CALL REQUEST | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p2</i> (forward request to DCE) | <i>A=ERROR</i> <i>S=p7</i> <i>D=21</i> (see Note 6) | Not applicable (see Note 4) | Not applicable (see Note 4) | <i>A=ERROR</i> <i>S=p7</i> <i>D=25</i> (see Note 6) | <i>A=DISCARD</i> |
| CALL ACCEPT | <i>A=ERROR</i> <i>S=p7</i> <i>D=20</i> (see Note 10) | <i>A=ERROR</i> <i>S=p7</i> <i>D=21</i> (see Note 6) | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p4</i> (forward to DCE), or <i>A=ERROR</i> | <i>A=ERROR</i> <i>S=p7</i> <i>D=23</i> (see Note 6) | <i>A=ERROR</i> <i>S=p7</i> <i>D=25</i> (see Note 6) | <i>A=DISCARD</i> |

S=p7
D=42
(see Note 6)

| | | | | | | |
|---|--|--|--|--|---|--------------------------------------|
| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) call setup and clearing States (See Notes 1, 7 and 8) | | | | | |
| | READY | GDLP (ADLP) | ADCE (GDCE) | GDLP (ADLP) | ADCE (GDCE) | CLEAR |
| | <i>p1</i> | <i>p2</i> | <i>p3</i> | <i>p4</i> | <i>p6</i> | <i>p7</i> |
| CLEAR REQUEST | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p6</i> (do not forward) | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p6</i> (forward to DCE) | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p6</i> (forward to DCE) | <i>A=NORMAL</i> (paragraph 23(1) <i>S=p6</i> (forward to DCE) | <i>A=DISCARD</i> <i>S=p1</i> (do not forward) | <i>A=NORMAL</i> (paragraph 23(1)) |
| CLEAR CONFIRMATION | <i>A=ERROR</i> <i>S=p7</i> | <i>A=ERROR</i> <i>S=p7</i> | <i>A=ERROR</i> <i>S=p7</i> | <i>A=ERROR</i> <i>S=p7</i> | <i>A=ERROR</i> <i>S=p7</i> | <i>A=NORMAL</i> |

| | D=20 | D=21 | D=22 | D=23 | D=25 | S=p1 |
|--------------------------|---------------|---------------------|---------------------|----------------|--------------|------------------|
| | (see Note 10) | (see Note 6) | (see Note 6) | (see Note 6) | (see Note 6) | (do not forward) |
| DATA, interrupt, flow | A=ERROR | A=ERROR | A=ERROR | See Table 5-17 | A=ERROR | A=DISCARD |
| control or reset packets | S=p7 | S=p7 | S=p7 | | S=p7 | |
| | D=20 | D=21 | D=22 | | D=25 | |
| | (see Note 10) | (see Notes 6 and 9) | (see Notes 5 and 6) | | (see Note 6) | |

NOTES:

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *All packets from the peer XDLP have been checked for duplication before evaluation as represented by this table.*
3. *A format error may result from an S-bit sequence having a first or intermediate packet shorter than the maximum length, or else from an invalid LV field in a CALL REQUEST, CALL ACCEPT, CLEAR REQUEST or INTERRUPT packet. There are no other detectable Mode S format errors.*
4. *The ADCE assigns all channel numbers used between the ADLP and GDLP, hence call collisions are not possible. When a CALL REQUEST by GDLP packet is received bearing a temporary channel number associated with an SVC in the p4 state, the association of the temporary to permanent channel number is broken.*
5. *Not applicable to the GDLP.*
6. *The error procedure consists of performing the actions specified when entering the p7 state (including sending a CLEAR REQUEST packet to the peer XDLP) and additionally sending a CLEAR REQUEST packet to the DCE (via the reformatting process).*
7. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
8. *The number in parentheses below an "A = NORMAL" table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*

9. An error condition is declared and transfer to the p7 state is possible only if the ground DTE address is known unambiguously. Otherwise the action is to discard the packet.
10. The error procedure consists of performing the action when entering the p7 state (including sending a CLEAR REQUEST packet to the XDLP) but without sending a CLEAR REQUEST packet to the local DCE.

Table 3-17 GDLP (ADLP) effect on DCE (GDCE) reset states

| Packet received from GDLP (ADLP) (see Note 2) | FLOW CONTROL | ADCE (GDCE) reset states (see Notes 1, 4 and 5) | |
|---|--|--|---|
| | READY <i>d1</i> | GDLP (ADLP) RE- RESET REQUEST <i>d2</i> | ADCE (GDCE) RE- SET REQUEST to GDLP (ADLP) <i>d3</i> |
| RESET | <i>A=NORMAL</i> | <i>A=DISCARD</i> | <i>A=NORMAL</i> |
| REQUEST | (paragraph 27(2) <i>S=d2</i> (forward to DCE) | | (paragraph 27(2) <i>S=d1</i> (do not forward) |
| RESET CONFIRMA- TION | <i>A=ERROR</i> <i>S=d3</i> <i>D=27</i> (see Note 3) | <i>A=ERROR</i> <i>S=d3</i> <i>D=28</i> (see Note 3) | <i>A=NORMAL</i> (do not forward) |
| INTERRUPT | See Table 3-18 | <i>A=ERROR</i> <i>S=d3</i> <i>D=28</i> (see Note 3) | <i>A=DISCARD</i> |
| INTERRUPT CONFIR- MATION | See Table 3-18 | <i>A=ERROR</i> <i>S=d3</i> <i>D=28</i> (see Note 3) | <i>A=DISCARD</i> |
| DATA or flow control packet | See Table 3-19 | <i>A=ERROR</i> | <i>A=DISCARD</i> |

| | | | |
|---------------------------|----------------|----------------|------------------|
| | | <i>S=d3</i> | |
| | | <i>D=28</i> | |
| | | (see Note 3) | |
| Format error (see Note 6) | <i>A=ERROR</i> | <i>A=ERROR</i> | <i>A=DISCARD</i> |
| | <i>S=d3</i> | <i>S=d3</i> | |
| | <i>D=33</i> | <i>D=33</i> | |
| | (see Note 3) | (see Note 3) | |

NOTES:

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *All packets from the peer XDLP have been checked for duplication before evaluation as represented by this table.*
3. *The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the peer XDLP) and sending a RESET REQUEST packet to the DCE (via the formatting function).*
4. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared for the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
5. *The number in parentheses below an “A = NORMAL” table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*
6. *A format error may result from an S-bit sequence having a first or intermediate packet shorter than the maximum length, or else from an invalid LV field in a CALL REQUEST, CALL ACCEPT, CLEAR REQUEST, or INTERRUPT packet. There are no other detectable Mode S format errors.*

Table 3-18. GDLP (ADLP) effect on ADCE (GDCE) interrupt transfer states

| | | |
|--|---|-----------------------|
| | ADCE/GDCE interrupt transfer states (see Notes 1, 3 and 4) | |
| | GDLP (ADLP) INTERRUPT | GDLP (ADLP) INTERRUPT |
| Packet received from GDLP (ADLP) (see Note 2) | READY <i>i1</i> | SENT <i>i2</i> |

| | | |
|---|--|---|
| INTERRUPT (see Note 6) | <i>A=NORMAL</i> <i>S=i2</i> (forward to DCE) | <i>A=ERROR</i> <i>S=d3</i> <i>D=44</i> (see Note 5) |
| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) interrupt transfer states (see Notes 1, 3 and 4) ADCE (GDCE) INTERRUPT READY <i>j1</i> | ADCE (GDCE) INTERRUPT SENT <i>j2</i> |
| INTERRUPT CONFIRMATION | <i>A=ERROR</i> <i>S=d3</i> <i>D=43</i> (see Note 5) | <i>A=NORMAL</i> <i>S=j1</i> (forward confirmation to DCE) |

NOTES

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *All packets from the peer XDLP have been checked for duplication before evaluation as represented by this table.*
3. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared for the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
4. *The number in parentheses below an "A = NORMAL" table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*
5. *The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the peer XDLP) and sending a RESET REQUEST packet to the DCE (via the reformatting process).*
6. *User data length for INTERRUPT packets greater than 32 bytes, or an out of sequence INTERRUPT packet, are considered as errors.*

Table 3-19 GDLP (ADLP) effect on ADCE (GDCE) flow control transfer states

| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) flow control transfer states (see Notes 1, 6 and 7) | |
|---|---|---|
| | ADCE (GDCE) RECEIVE READY <i>f1</i> | ADCE (GDCE) RECEIVE NOT READY <i>f2</i> |
| DATA packet with invalid PR (see Note 3) | <i>A=ERROR</i> <i>S=d3</i> <i>D=2</i> (see Note 8) | <i>A=ERROR</i> <i>S=d3</i> <i>D=2</i> (see Note 8) |
| DATA packet with valid PR, invalid PS or LV subfield (see Notes 4 and 5) | <i>A=DISCARD</i> , but process the PR value and send REJECT packet containing the expected PS value (see Note 5) | <i>A=DISCARD</i> , but process the PR value and send REJECT packet containing the expected PS value when busy condition ends |
| DATA packet with valid PR, PS and LV subfield | <i>A=NORMAL</i> (forward) | <i>A=PROCESS</i> , if possible; or <i>A=DISCARD</i> , but process the PR value and send REJECT containing the expected PS value when busy condition ends |
| Packet received from GDLP (ADLP) (see Note 2) | ADCE (GDCE) flow control transfer states (see Notes 1, 6 and 7) | |
| | GDLP (ADLP) RECEIVE READY <i>g1</i> | GDLP (ADLP) RECEIVE NOT READY <i>g2</i> |
| RR, RNR, REJECT packet with invalid PR (see Note 3) | <i>A=ERROR</i> <i>S=d3</i> <i>D=2</i> (see Note 8) | <i>A=ERROR</i> <i>S=d3</i> <i>D=2</i> (see Note 8) |
| RR with valid PR field (see Note 9) | <i>A=NORMAL</i> | <i>A=NORMAL</i> <i>S=g1</i> |
| RNR with valid PR value (see Note 9) | <i>A=NORMAL</i> | <i>A=NORMAL</i> |

| <i>S=g2</i> | | |
|--------------------------------------|-----------------|-----------------|
| REJECT with valid PR (see Note 9) | <i>A=NORMAL</i> | <i>A=NORMAL</i> |
| <i>S=g1</i> | | |

NOTES

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *All packets from the peer XDLP have been checked for duplication before evaluation as represented by this table.*
3. *An invalid PR value is one which is less than the PR value (modulo 16) of the last packet sent by the peer XDLP, or greater than the PS value of the next data packet to be transmitted by the XDLP.*
4. *An invalid PS value is one which is different from the next expected value for PS.*
5. *An invalid LV subfield is one which represents a value that is too large for the size of the segment received. In the event of an LV field error which gives rise to a loss of confidence in the correctness of the other fields in the packet, the packet is discarded without any further action.*
6. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
7. *The number in parentheses below an “A = NORMAL” table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*
8. *The error procedure consists of performing the specified actions when entering the d3 state (which includes forwarding a RESET REQUEST packet to the peer XDLP) and sending a RESET REQUEST packet to the DCE (via the reformatting process).*
9. *RR, RNR, and REJECT packets have no end-to-end significance and are not forwarded to the DCE.*
10. *The receipt of a packet smaller than the maximum packet size with M-bit = 1 will cause a reset to be generated and the remainder of the sequence will be discarded.*

Table 3-20. DCE effect on ADCE (GDCE) call setup and clearing states

| Packet received from DCE (see Notes 2 and 4) | ADCE (GDCE) call setup and clearing states (see Notes 1, 7 and 8) | | | | | |
|---|--|--|--|--|---|--|
| | READY <i>p1</i> | GDLP (ADLP) CALL REQUEST <i>p2</i> | ADCE (GDCE) CALL REQUEST <i>p3</i> | DATA TRANSFER <i>p4</i> | GDLP (ADLP) CLEAR REQUEST <i>p6</i> | ADCE (GDCE) to GDLP (ADLP) CLEAR REQUEST <i>p7</i> |
| CALL REQUEST (see Note 6) | <i>A=NORMAL</i> | INVALID (see Note 5) | INVALID (see Note 3) | INVALID (see Note 3) | INVALID (see Note 3) | INVALID (see Note 3) |
| | <i>S=p3</i> (forward) | | | | | |
| CALL ACCEPT (see Note 4) | <i>A=DISCARD</i> | <i>A=NORMAL</i> | INVALID (see Note 3) | INVALID (see Note 3) | <i>A=DISCARD</i> | <i>A=DISCARD</i> |
| | <i>S=p4</i> (forward) | | | | | |
| CLEAR REQUEST (see Note 4) | <i>A=DISCARD</i> | <i>A=NORMAL</i> | <i>A=NORMAL</i> | <i>A=NORMAL</i> | <i>A=DISCARD</i> | <i>A=DISCARD</i> |
| | | Paragraph 23(3) <i>S=p7</i> (forward) | Paragraph 23(3) <i>S=p7</i> (forward) | Paragraph 23(3) <i>S=p7</i> (forward) | | |
| DATA, INTERRUPT or RESET packets (see Note 4) | <i>A=DISCARD</i> | INVALID (see Note 3) | INVALID (see Note 3) | See Table 3-21 | <i>A=DISCARD</i> | <i>A=DISCARD</i> |

NOTES:

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *This is the DTE packet received via the DCE after all DTE/DCE processing has occurred. Procedures local to the DTE/DCE interface (such as RR, RNR, and REJECT if in effect), do not affect the XDCE directly. All error procedures as documented in ISO 8208 have been performed. Hence certain packets are rejected by the interface and are not represented in this table.*

3. *The DCE in its protocol operation with the DTE will detect this error condition, hence the erroneous packet can be said never to “reach” the XDCE; see also Note 2.*
4. *The channel number for the DTE/DCE need not be the same channel number used for the ADCE/GDCE; a packet from the DTE which contains a channel number is associated with an air/ground channel by means of a previously established cross-reference table. If none exists, then the DTE/DCE channel by definition references an air/ground channel in the p1 state.*
5. *The ADCE assigns all channel numbers used between the ADLP and GDLP; hence call collisions (denoted p5 ISO 8208) are not possible; see also Note 4.*
6. *A CALL REQUEST from the DTE can never be associated with an XDCE channel number which is not in the p1 state.*
7. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
8. *The number in parentheses below an “A = NORMAL” table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*

Table 3-21 DCE effect on ADCE (GDCE) Reset States

| | ADCE (GDCE) reset states (see Notes 1, 4 and 5) | | |
|--------------------------|--|------------------------------------|---|
| | FLOW CONTROL READY d1 | GDLP (ADLP) RESET REQUEST d2 | ADCE (GDCE) RESET REQUEST to GDLP (ADLP) d3 |
| Packet received from DCE | | | |
| RESET REQUEST | A=NORMAL S=d3 | A=NORMAL S=d1 | A=DISCARD |

| | | | |
|------------------------|------------------------------|--------------|--|
| | (forward) | (forward) | |
| RESET CONFIRMATION | INVALID | INVALID | INVALID |
| | (see Note 3) | (see Note 3) | (see Note 3) |
| INTERRUPT | See Table 3-22 | A=DISCARD | Hold interrupt until Mode S reset complete |
| INTERRUPT CONFIRMATION | See Table 3-22 | A=DISCARD | INVALID |
| | | | (see Note 3) |
| DATA (see Note 2) | A=NORMAL | A=DISCARD | Hold data until Mode S reset complete |
| | Paragraph 24(1)(a) (forward) | | |

NOTES

1. The XDCE is not necessarily in the same state as the DTE/DCE interface.
2. This is the DTE packet received via the DCE after all DTE/DCE processing has occurred. Procedures local to the DTE/DCE interface (such as RR, RNR, and REJECT if in effect), do not affect the XDCE directly. All error procedures as documented in ISO 8208 have been performed. Hence certain packets are rejected by the interface and are not represented in this table.
3. The DCE in its protocol operation with the DTE will detect this error condition, hence the erroneous packet can be said never to “reach” the XDCE; see also Note 2.
4. Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.
5. The number in parentheses below an “A = NORMAL” table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.

Table 3-22. DCE effect on ADCE (GDCE) interrupt transfer states

| | | |
|--------------------------|--|----------------|
| | ADCE (GDCE) interrupt transfer state (see Notes 1, 4 and 5) | |
| | GDLP (ADLP) | GDLP (ADLP) |
| Packet received from DCE | INTERRUPT READY | INTERRUPT SENT |

| | | |
|--|---|---|
| (see Note 2) | <i>i1</i> | <i>i2</i> |
| INTERRUPT CONFIRMATION | INVALID (See Note 3) | <i>A=NORMAL</i> <i>S=i1</i> (forward) |
| | ADCE (GDCE) interrupt transfer states (see Notes 1, 4 and 5) | |
| | ADCE (GDCE) | ADCE (GDCE) |
| Packet received from DCE (see Note 2) | INTERRUPT READY <i>j1</i> | INTERRUPT SENT <i>j2</i> |
| INTERRUPT | <i>A=NORMAL</i> | INVALID (see Note 3) |
| | <i>S=j2</i> | |
| | (forward) | |

:

NOTES

1. *The XDCE is not necessarily in the same state as the DTE/DCE interface.*
2. *This is the DTE packet received via the DCE after all DTE/DCE processing has occurred. Procedures local to the DTE/DCE interface (such as RR, RNR, and REJECT if in effect), do not affect the XDCE directly. All error procedures as documented in ISO 8208 have been performed. Hence certain packets are rejected by the interface and are not represented in this state.*
3. *The DCE in its protocol operation with the DTE will detect this error condition, hence the erroneous packet can be said never to “reach” the XDCE; see also Note 2.*
4. *Table entries are defined as follows: A = action to be taken, S = the state to be entered, D = the diagnostic code to be used in packets generated as a result of this action, DISCARD indicates that the received packet is to be cleared from the XDLP buffers, and INVALID indicates that the packet/state combination cannot occur.*
5. *The number in parentheses below an “A = NORMAL” table entry is the paragraph number in this document that defines the actions to be taken to perform normal processing on the received packet. If no paragraph number is referenced, the normal processing is defined in the table entry.*

Table 3-23 Broadcast identifier number assignments

| <i>Uplink broadcast</i> | |
|---------------------------|---|
| <i>identifier</i> | <i>Assignment</i> |
| 00 ₁₆ | Not valid |
| 01 ₁₆ | Reserved (differential GNSS correction) |
| 30 ₁₆ | Not valid |
| 31 ₁₆ | Reserved for ACAS (RA broadcast) |
| 32 ₁₆ | Reserved for ACAS (ACAS broadcast) |
| Others | Unassigned |
| <i>Downlink broadcast</i> | |
| <i>identifier</i> | <i>Assignment</i> |
| 00 ₁₆ | Not valid |
| 02 ₁₆ | Reserved (traffic information service) |
| 10 ₁₆ | Data link capability report |
| 20 ₁₆ | Aircraft identification |
| FE ₁₆ | Update request |
| FF ₁₆ | Search request |
| Others | Unassigned |

Table 3-24. Register number assignments

| <i>Transponder register No.</i> | <i>Assignment</i> |
|---------------------------------|---|
| 00 ₁₆ | Not valid |
| 01 ₁₆ | Unassigned |
| 02 ₁₆ | Linked Comm-B, segment 2 |
| 03 ₁₆ | Linked Comm-B, segment 3 |
| 04 ₁₆ | Linked Comm-B, segment 4 |
| 05 ₁₆ | Extended squitter airborne position |
| 06 ₁₆ | Extended squitter surface position |
| 07 ₁₆ | Extended squitter status |
| 08 ₁₆ | Extended squitter identification and type |

| | |
|------------------------------------|--|
| 09 ₁₆ | Extended squitter airborne velocity |
| 0A ₁₆ | Extended squitter event-driven information |
| 0B ₁₆ | Air/air information 1 (aircraft state) |
| 0C ₁₆ | Air/air information 2 (aircraft intent) |
| 0D ₁₆ -0E ₁₆ | Reserved for air/air state information |
| 0F ₁₆ | Reserved for ACAS |
| 10 ₁₆ | Data link capability report |
| 11 ₁₆ -16 ₁₆ | Reserved for extension to data link capability reports |
| 17 ₁₆ | Common usage GICB capability report |
| 18 ₁₆ -1F ₁₆ | Mode S specific services capability reports |
| 20 ₁₆ | Aircraft identification |
| 21 ₁₆ | Aircraft and airline registration markings |
| 22 ₁₆ | Antenna positions |
| 23 ₁₆ | Reserved for antenna position |
| 24 ₁₆ | Reserved for aircraft parameters |
| 25 ₁₆ | Aircraft type |
| 26 ₁₆ -2F ₁₆ | Unassigned |
| 30 ₁₆ | ACAS active resolution advisory |
| 31 ₁₆ -3F ₁₆ | Unassigned |
| 40 ₁₆ | Selected vertical intention |
| 41 ₁₆ | Next waypoint identifier |
| 42 ₁₆ | Next waypoint position |
| 43 ₁₆ | Next waypoint information |
| 44 ₁₆ | Meteorological routine air report |

Table 3-25 MSP channel number assignments

| <i>Transponder register No.</i> | <i>Assignment†</i> |
|------------------------------------|--|
| 45 ₁₆ | Meteorological hazard report |
| 46 ₁₆ | Reserved for flight management system Mode 1 |
| 47 ₁₆ | Reserved for flight management system Mode 2 |
| 48 ₁₆ | VHF channel report |
| 49 ₁₆ -4F ₁₆ | Unassigned |
| 50 ₁₆ | Track and turn report |
| 51 ₁₆ | Position report coarse |
| 52 ₁₆ | Position report fine |
| 53 ₁₆ | Air-referenced state vector |

| | |
|------------------------------------|--|
| 54 ₁₆ | Waypoint 1 |
| 55 ₁₆ | Waypoint 2 |
| 56 ₁₆ | Waypoint 3 |
| 57 ₁₆ -5E ₁₆ | Unassigned |
| 5F ₁₆ | Quasi-static parameter monitoring |
| 60 ₁₆ | Heading and speed report |
| 61 ₁₆ | Extended squitter emergency/priority status |
| 62 ₁₆ | Reserved for target state and status information |
| 63 ₁₆ | Reserved for extended squitter |
| 64 ₁₆ | Reserved for extended squitter |
| 65 ₁₆ | Aircraft operational status |
| 66 ₁₆ -6F ₁₆ | Reserved for extended squitter |
| 70 ₁₆ -75 ₁₆ | Reserved for future aircraft downlink parameters |
| 76 ₁₆ -E0 ₁₆ | Unassigned |
| E1 ₁₆ -E2 ₁₆ | Reserved for Mode S BITE |
| E3 ₁₆ | Transponder type/part number |
| E4 ₁₆ | Transponder software revision number |
| E5 ₁₆ | ACAS unit part number |
| E6 ₁₆ | ACAS unit software revision number |
| E7 ₁₆ -F0 ₁₆ | Unassigned |
| F1 ₁₆ | Military applications |
| F2 ₁₆ | Military applications |
| F3 ₁₆ -FF ₁₆ | Unassigned |

Note. — In the context of Table 3-24, the term “aircraft” can be understood as “transponder carrying aircraft”, “pseudo-aircraft (e.g. an obstacle)” or “vehicle”.

Table 3-26. MSP channel number assignments

| <i>Uplink channel number</i> | <i>Assignment</i> |
|------------------------------|--|
| 0 | Not valid |
| 1 | Reserved (specific services management) |
| 2 | Reserved (traffic information service) |
| 3 | Reserved (ground-to-air alert) |
| 4 | Reserved (ground derived position) |
| 5 | ACAS sensitivity level control |
| 6 | Reserved (ground-to-air service request) |

| | |
|------|---|
| 7 | Reserved (air-to-ground service response) |
| 8–63 | Unassigned |

*Downlink
channel
number* *Assignment*

| | |
|------|---|
| 0 | Not valid |
| 1 | Reserved (specific services management) |
| 2 | Unassigned |
| 3 | Reserved (data flash) |
| 4 | Reserved (position request) |
| 5 | Unassigned |
| 6 | Reserved (ground-to-air service response) |
| 7 | Reserved (air-to-ground service request) |
| 8–63 | Unassigned |

SCHEDULE 4

Regulation 48(c)

MODE S PACKET FORMATS

1. The Mode S packet formats shall be as specified in Figures 4-1 to 4-22 of this Schedule.
2. *Significance of control fields.* The structure of the format control fields used in Mode S packets shall be as specified in Figure 4-23. The significance of all control fields used in these packet formats shall be as follows—

Figure 4-1 The SD field structure

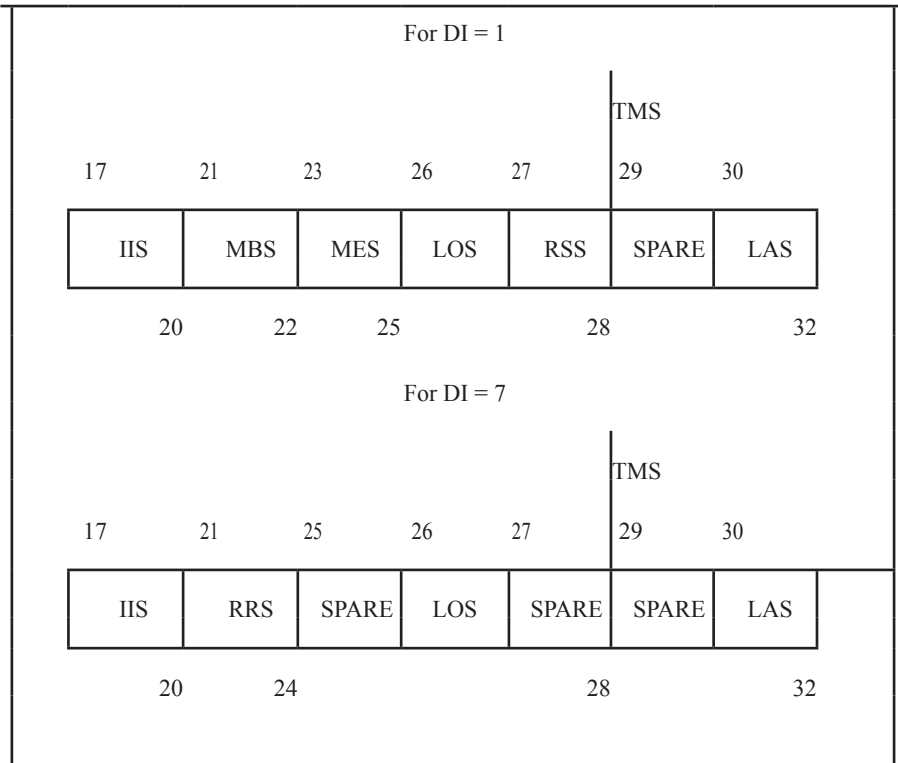


Figure 4-2 DCE substate hierarchy

| | | | | | | | |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------------------|
| Ready and restart states | | <i>r1</i> | <i>r2</i> | <i>r3</i> | | | |
| Call setup and clearing states | <i>p1</i> | <i>p2</i> | <i>p3</i> | <i>p4</i> | <i>p5</i> | <i>p6</i> | <i>p7</i> |
| Data transfer states | | <i>d1</i> | <i>d2</i> | <i>d3</i> | | | |
| Interrupt and control states | <i>f1</i> | <i>f2</i> | <i>g1</i> | <i>g2</i> | <i>i1</i> | <i>i2</i> | <i>j1</i> <i>j2</i> |

Note.— States *r1*, *p4* and *d1* (shown circled) are states that provide access to the lower levels of the DCE substate hierarchy.

Figure 4-4 Call Request by GDLP packet

| | | | | | | | |
|------|------|------|------|------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=1 | ST=0 | FILL | | | |
| P | FILL | SN | | | | | |
| FILL | | TC | AM | | | | |
| AG | | | | | | | |
| S | FS | F | LV | | | | |

UD

Figure 4-5 Call Accept by ADLP packet

| | | | | | | | |
|------|------|------|------|-------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=1 | ST=1 | FILL2 | | | |
| TC | | | SN | | | | |

| | | | | |
|----|------|--|----|----|
| CH | | | AM | |
| AG | | | | |
| S | FILL | | F | LV |

UD

Figure 4-6. CALL ACCEPT by GDLP packet

| | | | | | | | |
|------|------|---|------|----|------|---|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | | SP=1 | | ST=1 | | FILL |
| FILL | | | SN | | | | |
| CH | | | | AM | | | |
| AG | | | | | | | |
| s | FILL | | F | LV | | | |

UD

Figure 4-7 CLEAR REQUEST by ADLP packet

| | | | | | | | |
|------|------|---|------|----|------|---|-------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | | SP=1 | | ST=2 | | FILL2 |
| TC | | | SN | | | | |
| CH | | | | AM | | | |
| AG | | | | | | | |
| CC | | | | | | | |
| DC | | | | | | | |
| S | FILL | | F | LV | | | |

UD

Figure 4-8 Clear request by GDLP packet

| | | | | | | | | | |
|------|--|------|--|------|---|------|--|------|--|
| 2 | | 3 4 | | 5 6 | | 7 | | 8 | |
| DP=0 | | MP=1 | | SP=1 | | ST=2 | | FILL | |
| TC | | | | SN | | | | | |
| CH | | | | | | AM | | | |
| AG | | | | | | | | | |
| CC | | | | | | | | | |
| DC | | | | | | | | | |
| S | | FILL | | | F | LV | | | |
| UD | | | | | | | | | |

Figure 4-9 Clear Confirmation by ADLP packet

| | | | | | | | | | |
|------|--|------|--|------|--|------|--|-------|--|
| 1 | | 2 3 | | 4 5 | | 6 7 | | 8 | |
| DP=0 | | MP=1 | | SP=1 | | ST=3 | | FILL2 | |
| TC | | | | SN | | | | | |
| CH | | | | | | AM | | | |
| AG | | | | | | | | | |

Figure 4-10 clear confirmation by GDLP packet

| | | | | | | | | | |
|------|--|------|--|------|--|------|--|------|--|
| 1 | | 2 3 | | 4 5 | | 6 7 | | 8 | |
| DP=0 | | MP=1 | | SP=1 | | ST=3 | | FILL | |
| TC | | | | SN | | | | | |
| CH | | | | | | AM | | | |
| AG | | | | | | | | | |

Figure 4-11 Data packet

| | | | | | | | |
|-------|---|----|---|----|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=1 | M | SN | | | | | |
| FILL1 | | | | | | | |
| PS | | | | PR | | | |
| CH | | | | LV | | | |
| UD | | | | | | | |

Figure 4-12 Interrupt packet

| | | | | | | | |
|------|------|------|------|-------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=3 | ST=1 | FILL2 | | | |
| S | F | SN | | | | | |
| CH | | | | LV | | | |
| UD | | | | | | | |

Figure 4-13 interrupt Confirmation packet

| | | | | | | | |
|-------|------|------|------|------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=3 | ST=3 | SS=0 | | | |
| FILL2 | | | SN | | | | |
| CH | | | | FILL | | | |

Figure 4-14 Reject packet

| | | | | | | | |
|-------|------|------|------|------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=3 | ST=3 | SS=1 | | | |
| FILL2 | | | SN | | | | |
| CH | | | | PR | | | |

Figure 4-15 Receive Ready packet

| | | | | | | | |
|------|------|------|------|-------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=2 | ST=0 | FILL2 | | | |
| FILL | | | SN | | | | |
| CH | | | | PR | | | |

Figure 4-16 Receive not ready packet

| | | | | | | | |
|------|------|------|------|-------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=2 | ST=1 | FILL2 | | | |
| FILL | | | SN | | | | |
| CH | | | | PR | | | |

Figure 4-17 Reset Request packet

| | | | | | | | |
|------|------|------|------|-------|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| DP=0 | MP=1 | SP=2 | ST=2 | FILL2 | | | |
| FILL | | | SN | | | | |
| CH | | | | FILL | | | |
| RC | | | | | | | |
| DC | | | | | | | |

Figure 4-18 Reset Confirmation packet

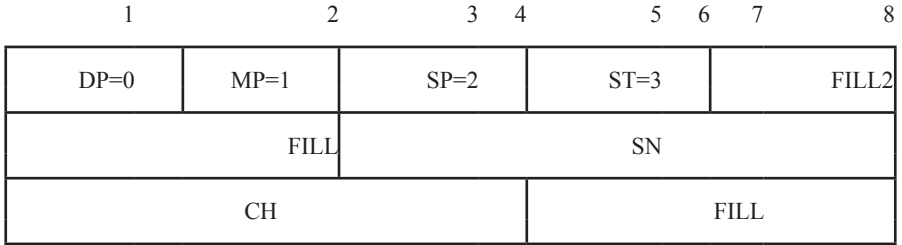
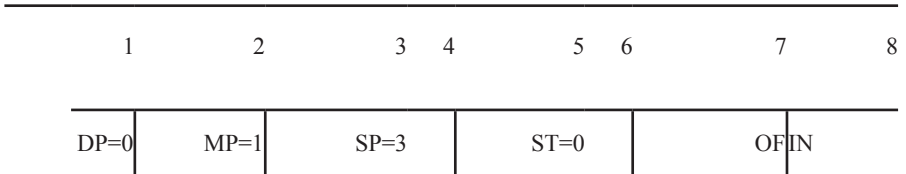


Figure 4-19 Route Packet



RTL

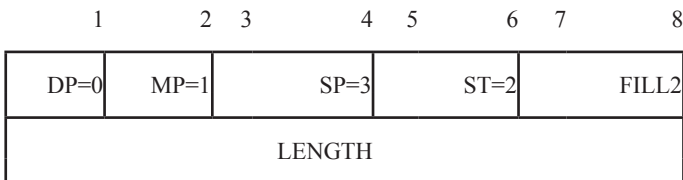
⋮

RT

ODL

OD

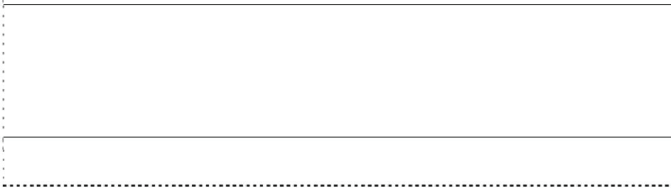
Figure 4-20 Multiplex Packet



FIRST PACKET

-

LENGTH:



LAST PACKET

LENGTH = 0

Figure 4-21 Short Form MSP packet

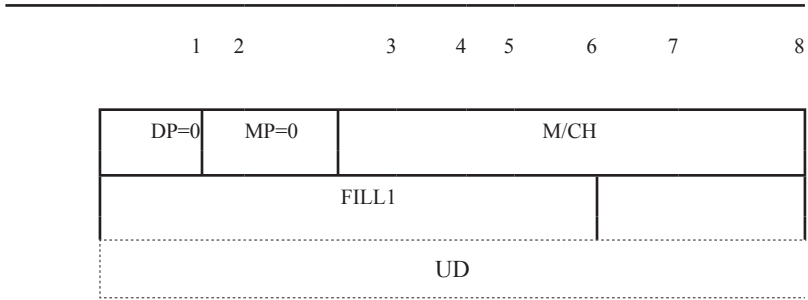


Figure 4-22 Long Form MSP Packet

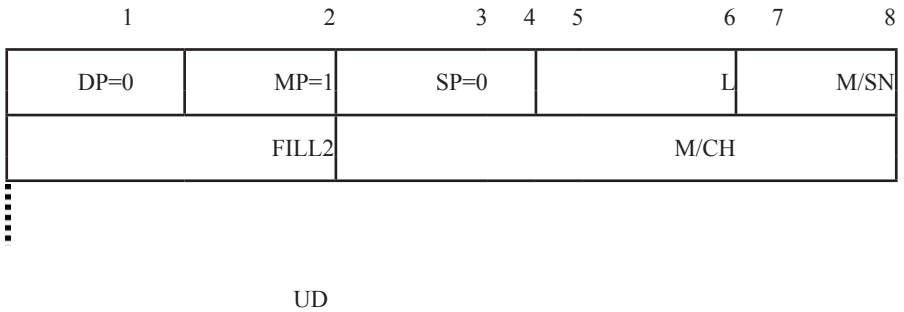
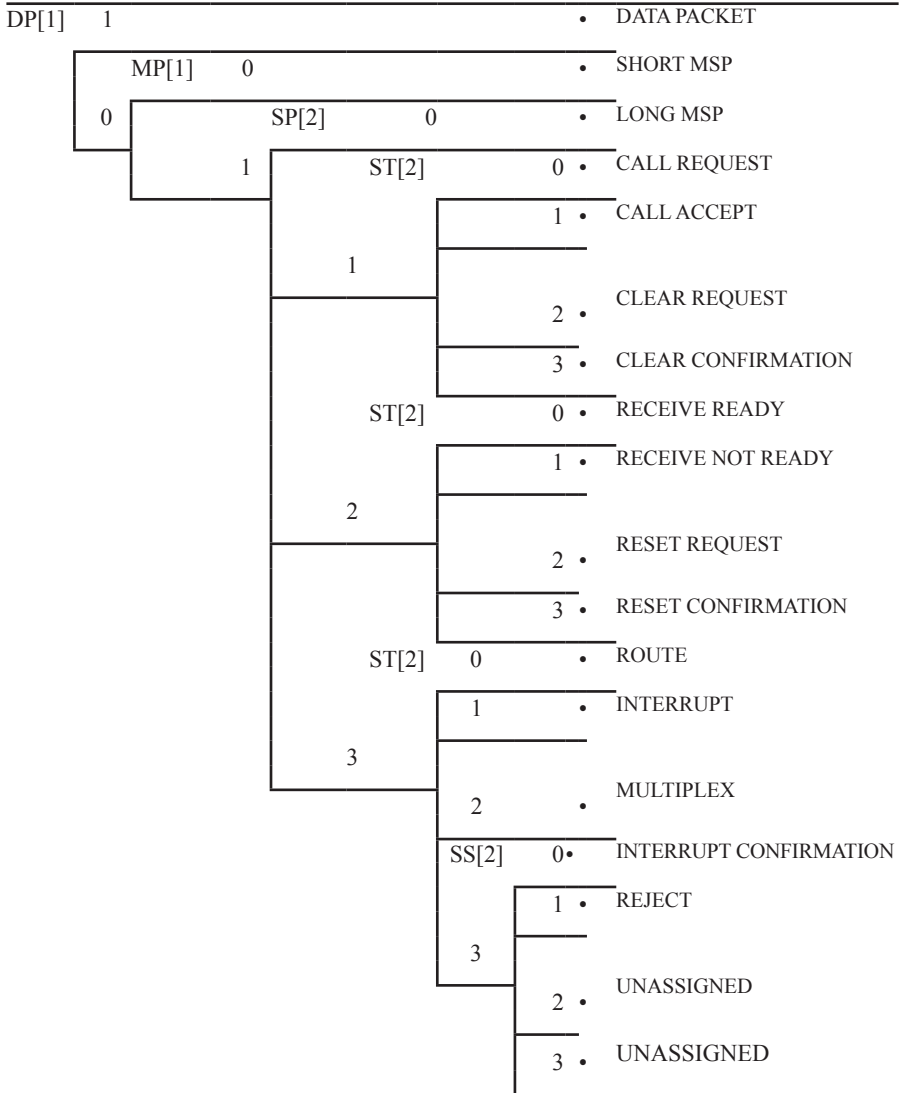


Figure 4-23 Control fields used in Mode S packets



LEGEND:
 DP = DATA packet type
 MP = MSP packet type
 SP = SUPERVISORY packet
 ST = SUPERVISORY type
 SS = SUPERVISORY subset

SCHEDULE 5

VHF AIR GROUND DIGITAL LINK (VDL)

Regulation 52

System characteristics of the ground installation for VHF Air-Ground Digital Link

Ground station transmitting function

1. Frequency stability.

The radio frequency of VDL ground station equipment operation shall not vary more than plus or minus 0.0002 per cent (2 parts per million) from the assigned frequency.

2. Power.

The effective radiated power shall be such as to provide a field strength of at least 75 microvolts per metre (minus 109 dBW/m²) within the defined operational coverage of the facility, on the basis of free-space propagation.

3. Spurious emissions.

Spurious emissions shall be kept at the lowest value which the State of the technique and the nature of the service permit.

Note.— Appendix S3 to the Radio Regulations specifies the levels of spurious emissions to which transmitters must conform.

4. Adjacent channel emissions

(1) The amount of power from a VDL ground transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the first adjacent channel shall not exceed 0 dBm.

(2) The amount of power from all new installations of a VDL ground transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the first adjacent channel shall not exceed 2 dBm.

(3) The amount of power from a VDL ground transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the second adjacent channel shall be less than

minus 25 dBm and from thereon it shall monotonically decrease at the minimum rate of 5 dB per octave to a maximum value of minus 52 dBm.

- (4) The amount of power from all new installations of a VDL ground transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the second adjacent channel shall be less than minus 28 dBm.
- (5) The amount of power from all new installations of a VDL ground transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the fourth adjacent channel shall be less than minus 38 dBm, and from thereon it shall monotonically decrease at the minimum rate of 5 dB per octave to a maximum value of minus 53 dBm.
- (6) The amount of power from a VDL ground transmitter under all operating conditions when measured over a 16 kHz channel bandwidth centred on the first adjacent channel shall not exceed minus 20 dBm.
- (7) The amount of power from all new installations of a VDL ground transmitter under all operating conditions when measured over a 16 kHz channel bandwidth centred on the first adjacent channel shall not exceed minus 18 dBm.
- (8) All VDL ground transmitters shall meet the provisions of subparagraph (2), (4), (5) and (7), subject to the conditions of subparagraph (9).
- (9) Requirements of mandatory compliance of the provisions of subparagraph (8) shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales. The agreements shall provide at least two years' notice of mandatory compliance of ground systems.

SCHEDULE 6

VHF AIR GROUND DIGITAL LINK (VDL)

Regulation 53

System characteristics of the aircraft installation for VHF Air-Ground Digital Link

1. Frequency stability.

The radio frequency of VDL aircraft equipment shall not vary more than plus or minus 0.0005 per cent (5 parts per million) from the assigned frequency.

2. Power.

The effective radiated power shall be such as to provide a field strength of at least 20 microvolts per metre (minus 120 dBW/m²) on the basis of free-space propagation, at ranges and altitudes appropriate to the operational conditions pertaining to the areas over which the aircraft is operated.

3. Spurious emissions

Spurious emissions shall be kept at the lowest value which the State of the technique and the nature of the service permit.

Note.— Appendix S3 to the Radio Regulations specifies the levels of spurious emissions to which transmitters must conform.

4. Adjacent channel emissions

- (1) The amount of power from a VDL aircraft transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the first adjacent channel shall not exceed 0 dBm.
- (2) The amount of power from all new installations of a VDL aircraft transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the first adjacent channel shall not exceed 2 dBm.
- (3) The amount of power from a VDL aircraft transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the second adjacent channel shall be less than

minus 25 dBm and from thereon it shall monotonically decrease at the minimum rate of 5 dB per octave to a maximum value of minus 52 dBm.

- (4) The amount of power from all new installations of a VDL aircraft transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the second adjacent channel shall be less than minus 28 dBm.
- (5) The amount of power from all new installations of a VDL aircraft transmitter under all operating conditions when measured over the 25 kHz channel bandwidth of the fourth adjacent channel shall be less than minus 38 dBm, and from thereon it shall monotonically decrease at the minimum rate of 5 dB per octave to a maximum value of minus 53 dBm.
- (6) The amount of power from a VDL aircraft transmitter under all operating conditions when measured over a 16 kHz channel bandwidth centred on the first adjacent channel shall not exceed minus 20 dBm.
- (7) The amount of power from all new installations of a VDL aircraft transmitter under all operating conditions when measured over a 16 kHz channel bandwidth centred on the first adjacent channel shall not exceed minus 18 dBm.
- (8) All VDL aircraft transmitters shall meet the provisions of subparagraph (2), (4), (5) and (7), subject to the conditions of subparagraph (9).
- (9) Requirements of mandatory compliance of the provisions of subparagraph (8) shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales. The agreements shall provide at least two years' notice of mandatory compliance of aircraft systems.

5. Receiving function

- (1) Specified error rate. The specified error rate for Mode 2 operation shall be the maximum corrected Bit Error Rate (BER) of 1 in

10^4 . The specified error rate for Mode 3 operation shall be the maximum uncorrected BER of 1 in 10^3 . The specified error rate for Mode 4 operation shall be the maximum uncorrected BER of 1 in 10^4 .

Note. — *The above physical layer BER requirements are derived from the BER requirement imposed by ATN at the subnetwork interface.*

- (2) Sensitivity. The receiving function shall satisfy the specified error rate with a desired signal strength of not more than 20 microvolts per metre (minus 120 dBW/m²).

Note.— *The required signal strength at the edge of the service volume takes into account the requirements of the system and signal losses within the system, and considers environmental noise sources.*

- (3) Out-of-band immunity performance. The receiving function shall satisfy the specified error rate with a desired signal field strength of not more than 40 microvolts per metre (minus 114 dBW/m²) and with an undesired DSB-AM D8PSK or GFSK signal on the adjacent or any other assignable channel being at least 40 dB higher than the desired signal.
- (4) The receiving function of all new installations of VDL shall satisfy the specified error rate with a desired signal field strength of not more than 40 microvolts per metre (minus 114 dBW/m²) and with an undesired VHF DSB-AM, D8PSK or GFSK signal at least 60 dB higher than the desired signal on any assignable channel 100 kHz or more away from the assigned channel of the desired signal.

Note.— *This level of interference immunity performance provides a receiver performance consistent with the influence of the VDL RF spectrum mask as specified in 6.3.4 with an effective isolation transmitter/receiver isolation of 69 dB. Better transmitter and receiver performance could result in less isolation required. Guidance material on the measurement technique is included in the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of Approved ICAO Policies (Doc 9718).*

- (5) The receiving function of all installations of VDL shall meet the provisions of subparagraph (4), subject to the conditions of subparagraph (3).
- (6) Requirements of mandatory compliance of the provisions of subparagraph (2), shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales. The agreement shall provide for at least two years' notice of mandatory compliance of aircraft systems.

6. Interference immunity performance

- (1) The receiving function shall satisfy the specified error rate with a desired field strength of not more than 40 microvolts per metre, and with one or more out-of-band signals, except for VHF FM broadcast signals, having a total level at the receiver input of minus 33 dBm.

Note.— In areas where adjacent higher band signal interference exceeds this specification, a higher immunity requirement will apply.

- (2) The receiving function shall satisfy the specified error rate with a desired field strength of not more than 40 microvolts per metre, and with one or more VHF FM broadcast signals having a total level at the receiver input of minus 5 dBm.

SCHEDULE 7

VHF AIR GROUND DIGITAL LINK SYSTEMS

Regulation 54(a)

1. Physical layer protocols and services

The aircraft and ground stations shall access the physical medium operating in simplex mode.

- (1) The physical layer shall provide the following functions—
 - (a) transmitter and receiver frequency control;
 - (b) digital reception by the receiver;
 - (c) digital transmission by the transmitter; and
 - (d) notification services.
- (2) Transmitter/receiver frequency control. The VDL physical layer shall set the transmitter or receiver frequency as commanded by the link management entity (LME).
- (3) Digital reception by the receiver. The receiver shall decode input signals and forward them to the higher layers for processing.
- (4) Digital transmission. The VDL physical layer shall appropriately encode and transmit information received from higher layers over the RF channel.

2. Modes 2 and 3 common physical layer

- (1) Modulation scheme. Modes 2 and 3 shall use differentially encoded 8 phase shift keying (D8PSK), using a raised cosine filter with $\alpha = 0.6$ (nominal value). The information to be transmitted shall be differentially encoded with 3 bits per symbol (baud) transmitted as changes in phase rather than absolute phase. The data stream to be transmitted shall be divided into groups of 3 consecutive data bits, least significant bit first. Zeros shall be padded to the end of the transmissions if needed for the final channel symbol.

- (2) Data encoding. A binary data stream entering a differential data encoder shall be converted into three separate binary streams X, Y, and Z so that bits 3n form X, bits 3n + 1 form Y, and bits 3n + 2 form Z. The triplet at time k (X_k, Y_k, Z_k) shall be converted to a change in phase as shown in Table 7-1, and the absolute phase ϕ_k is the accumulated series of $\Delta\phi_k$, that is- $\phi_k = \phi_{k-1} + \Delta\phi_k$

Table 7-1. Modes 2 and 3 data encoding

| X_k | Y_k | Z_k | ϕ_k |
|-------|-------|-------|-------------|
| 0 | 0 | 0 | $0 \pi / 4$ |
| 0 | 0 | 1 | $1 \pi / 4$ |
| 0 | | 1 | $2 \pi / 4$ |
| 0 | 1 | 0 | $3 \pi / 4$ |
| 1 | 1 | 0 | $4 \pi / 4$ |
| 1 | 1 | 1 | $5 \pi / 4$ |
| 1 | 0 | 1 | $6 \pi / 4$ |
| 1 | 0 | 0 | $7 \pi / 4$ |

- (3) Transmitted signal form. The phase-modulated baseband signal as defined in subparagraph (2) shall excite the pulse shape filter.

$$s(t) = \sum_{k=-\infty}^{+\infty} h(\phi_k, t - kT_s)$$

where:

h is the complex impulse response of the pulse shape filter;

k is defined in paragraph 2(2);

ϕ is defined by the equation in paragraph 2(2);

t is time;

T_s is time duration of each symbol.

The output (function of time) of the pulse shape filter ($s(t)$) shall modulate the carrier frequency. The pulse shape filter shall have a nominal complex frequency response of a raised-cosine filter with $\alpha=0.6$.

- (4) Modulation rate. The symbol rate shall be 10 500 symbols/second, resulting in a nominal bit rate of 31 500 bits/s. The modulation stability requirements for Modes 2 and 3 are provided in Table 7-2.

Table 7-2. Modes 2 and 3 modulation stability

| VDL Mode | Aircraft Modulation Stability | Ground Modulation Stability |
|----------|-------------------------------|-----------------------------|
| Mode 2 | ± 0.0050 per cent | ± 0.0050 per cent |
| Mode 3 | ± 0.0005 per cent | ± 0.0002 per cent |

3. Mode 2 specific physical layer

Note.— The Mode 2 specific physical layer specification includes a description of the Mode 2 training sequence, forward error correction (FEC), interleaving, bit scrambling, channel sensing, and physical layer system parameters.

- (1) To transmit a sequence of frames, a station shall insert the bit numbers and flags (per the data link service description for Mode 2 as contained in the Manual on VDL Mode 2 Technical Specifications), compute the FEC, interleave, prepend the training sequence, carry out bit scrambling and finally encode and modulate the RF signal.
- (2) Training sequence. Data transmission shall begin with a demodulator training sequence consisting of five segments—
- (a) transmitter ramp-up and power stabilisation ;
 - (b) synchronisation and ambiguity resolution;
 - (c) reserved symbol;

- (d) transmission length; and
- (e) header FEC.

Note.— Immediately after these segments follows an AVLC frame with the format as contained in the data link service description in the Manual on VDL Mode 2 Technical Specifications.

- (3) Transmitter ramp-up and power stabilisation . The purpose of the first segment of the training sequence, called the ramp-up, is to provide for transmitter power stabilisation and receiver AGC settling, and it shall immediately precede the first symbol of the unique word. The duration of the ramp-up shall be five symbol periods. The time reference point (t), for the following specification is the centre of the first unique word symbol, a point that occurs half a symbol period after the end of the ramp-up. Conversely Stated, the beginning of the ramp-up starts at $t = -5.5$ symbol periods. The transmitted power shall be less than -40 dBc prior to time $t = -5.5$ symbol periods. The ramp-up shall provide that at time $t = -3.0$ symbol periods the transmitted power is 90 per cent of the manufacturer's Stated output power or greater (see Figure 7-1). Regardless of the method used to implement (or truncate) the raised cosine filter, the output of the transmitter between times $t = -3.0$ and $t = -0.5$ will appear as if '000' symbols were transmitted during the ramp-up period.

Figure 7-1 Transmitter Power Stabilisation

Note. 1.— For Mode 3, the timing reference point is the same as the “power reference point”.

Note 2.— It is desirable to maximize the time allowed for the AGC settling time. Efforts shall be made to have power above 90 per cent of nominal output power at $t - 3.5$ symbol periods.

- (4) Synchronisation and ambiguity resolution. The second segment of the training sequence shall consist of the unique word:

000 010 011 110 000 001 101 110 001 100 011 111 101 111
100 010

and shall be transmitted from left to right.

- (5) Reserved symbol. The third segment of the training sequence shall consist of the single symbol representing 000.
- (6) Transmission length. To allow the receiver to determine the length of the final Reed-Solomon block, the transmitter shall send a 17-bit word, from least significant bit (lsb) to most significant bit (msb), indicating the total number of data bits that follow the header FEC

Note.— The length does not include those bits transmitted for: the Reed Solomon FEC, extra bits padded to ensure that the interleaver generates an integral number of 8-bit words, or the extra bits padded to ensure that the data encoder generates an integral number of 3-bit symbols.

- (7) Header FEC. To correct bit errors in the header, a (25, 20) block code shall be computed over the reserved symbol and the transmission length segments. The block code shall be transmitted as the fifth segment. The encoder shall accept the header in the bit sequence that is being transmitted. The five parity bits to be transmitted shall be generated using the following equation—

$$[P_1, \dots, P_5] = [R_1, \dots, R_3, TL_1, \dots, TL_{17}] H^T$$

where—

P is the parity symbol (P1 shall be transmitted first);

R is the reserved symbol;

TL is the transmission Length symbol;

T is the matrix transpose function; and

H is the parity matrix defined below:

$$= \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

- (8) Bit transmission order. The five parity bits of the resultant vector product shall be transmitted from the left bit first.
- (9) Forward error correction. In order to improve the effective channel throughput by reducing the number of required retransmissions, FEC shall be applied after the training sequence, regardless of frame boundaries.
- (10) FEC calculation. The FEC coding shall be accomplished by means of a systematic fixed-length Reed- Solomon **(RS)(255,249) 2⁸-ary code.**

Note 1.— This code is capable of correcting up to three octets for data blocks of 249 octets (1992 bits). Longer transmissions must be divided up into 1992 bit transmissions and shorter transmissions must be extended by virtual fill with trailing zeros. Six RS-check octets are appended for a total block of 255 octets.

The field defining the primitive polynomial of the code shall be as follows-

$$p(x) = (x^8 + x^7 + x^2 + x + 1)$$

The generator polynomial shall be as follows—

$$\prod_{i=120}^{125} (x - \alpha^i)$$

where:

α is a primitive element of GF(256);
GF(256) is a Galois field (GF) of size 256.

Note 2.— The Reed-Solomon codes are described in the recommendation for Space Data System Standards Telemetry Channel Coding, by the Consultative Committee for Space Data Systems.

- (11) Block lengths. The six RS-check octets shall be calculated on blocks of 249 octets. Longer transmissions shall be split into blocks of 249 octets. Blocks of shorter length shall be extended to 249 octets by a virtual fill of trailing zeros. The virtual fill shall not be transmitted. Blocks shall be coded according to subparagraph (12) through subparagraph (15).
- (12) No error correction. For blocks with 2 or fewer non-fill octets, no error correction shall be used.
- (13) *Single-byte error correction.* For blocks with 3 to 30 non-fill octets, all six RS-check octets shall be generated, but only the first two shall be transmitted. The last four RS-check octets shall be treated as erasures at the decoder.
- (14) *Two-byte error correction.* For blocks with 31 to 67 non-fill octets, all six RS-check octets shall be generated, but only the first four shall be transmitted. The last two RS-check octets shall be treated as erasures at the decoder.

- (15) Three-byte error correction. For blocks with 68 or more non-fill octets, all six RS-check octets shall be generated and transmitted.
- (16) *Interleaving*. To improve the performance of the FEC, an octet-based table-driven interleaver shall be used. The interleaver shall create a table having 255 octets per row and c rows, where

$$= \frac{\textit{transmission length (bits)}}{1992 \textit{ (bits)}}$$

Where—

- (a) the transmission length is as defined in paragraph 3(7) and
- (b) c = the smallest integer greater than or equal to the value of the fraction.

After extending the data to an even multiple of 1992 bits, the interleaver shall write the transmission stream into the first 249 octets of each row by taking each consecutive group of eight bits and storing them from the first column to the 249th. The first bit in each group of eight bits shall be stored in the eighth bit position; the first group of 1992 bits shall be stored in the first row, the second group of 1992 bits in the second row, etc. After the FEC is computed on each row, the FEC data (or erasures) shall be stored in columns 250 through 255. The interleaver shall then pass the data to the scrambler by reading out column by column, skipping any octet which contains erasures or all fill bits. All of the bits in an octet shall be transmitted from bit 8 to bit 1.

On reception, the de-interleaver shall calculate the number of rows and size of the last (potentially partial) row from the length field in the header. It shall only pass valid data bytes to the higher layer.

- (17) *Bit scrambling*. To aid clock recovery and to stabilize the shape of the transmitted spectrum, bit scrambling shall be applied. The pseudo noise (PN) sequence shall be a 15-stage generator with the characteristic polynomial:

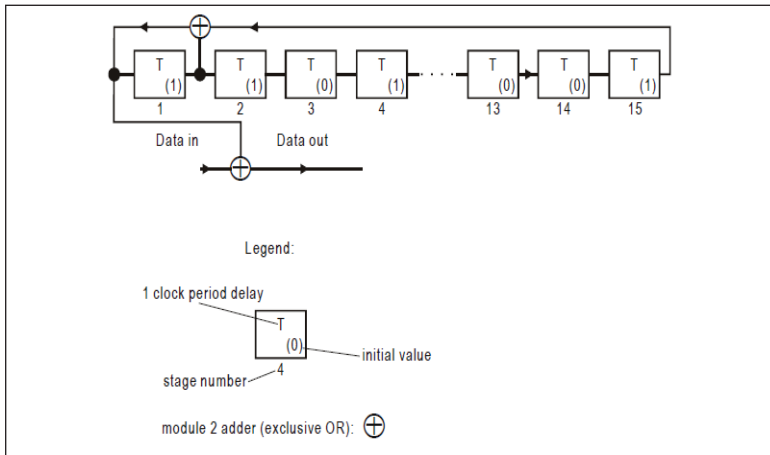
$$X^{15} + X + 1$$

The PN-sequence shall start after the frame synchronisation pattern with the initial value 1101 0010 1011 001 with the leftmost bit in the first stage of the register as per Figure 7-2. After processing each bit, the register shall be shifted one bit to the right. For possible encryption in the future this initial value shall be programmed. The sequence shall be added (modulo 2) to the data at the transmit side (scrambling) and to the scrambled data at the receive side (descrambling) per Table 7-3.

Table 7-3. Scrambler functions

| Function | Data in | Data out |
|--------------|----------------|----------------|
| scrambling | clean data | scrambled data |
| descrambling | scrambled data | clean data |

Figure 7-2 PN-generator for bit scrambling sequence



4. Mode 2 Channel sensing

- (1) Channel busy to idle detection. When a station receives on-channel power of at least -87 dBm for at least 5 milliseconds, then:

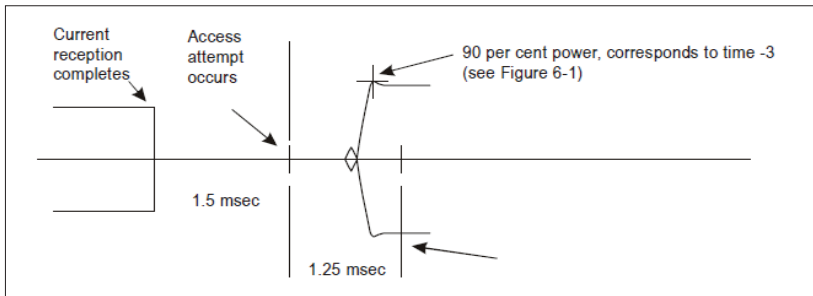
- (a) with a likelihood of 0.9, it shall continue to consider the channel occupied if the signal level is attenuated to below -92 dBm for less than 1 millisecond; and
 - (b) with a likelihood of 0.9, it shall consider the channel unoccupied if the signal level is attenuated to below -92 dBm for at least 1.5 milliseconds.
- (2) Channel idle to busy detection. With a likelihood of at least 0.9, a station shall consider the channel occupied within 1 millisecond after on-channel power rises to at least -90 dBm.
 - (3) The detection of an occupied channel shall occur within 0.5 milliseconds.

Note. — A higher probability of false alarm is acceptable on the idle to busy detection than the busy to idle detection because of the effects of the two different errors.

5. Mode 2 receiver/transmitter interaction

- (1) Receiver to transmitter turnaround time. A station shall transmit the training sequence such that the centre of the first symbol of the unique word will be transmitted within 1.25 milliseconds after the result of an access attempt is successful (*see Figure 7-3*). The total frequency change during the transmission of the unique word shall be less than 10 Hz. After transmission of the unique word, the phase acceleration shall be less than 500 Hz per second.

Figure 7-3 Receive to transmit turnaround time



- (2) Transmitter to receiver turnaround time. The transmitter power shall be -20 dBc within 2.5 symbol periods of the middle of the final symbol of the burst. The transmitter power leakage when the transmitter is in the “off” State shall be less than -83 dBm. A station shall be capable of receiving and demodulating with nominal performance, an incoming signal within 1.5 milliseconds after transmission of the final information symbol.

6. Mode 2 Physical layer system parameters

- (1) The physical layer shall implement the system parameters as defined in Table 7-4.

Table 7-4. Physical services system parameters

| Symbol | Parameter name | Mode 2 value |
|--------|-----------------------------|--------------|
| P1 | Minimum transmission length | 131071 bits |

- (2) Parameter P1 (minimum transmission length). Parameter P1 defines the minimum transmission length that a receiver shall be capable of demodulating without degradation of BER.

7. Mode 3 specific physical layer

Note.— The Mode 3 specific physical layer specification includes a description of Mode 3 management (M) burst and handoff check message (H) burst uplink, M burst downlink, voice/data (V/D) burst, and bit scrambling.

- (1) Management (M) burst and handoff check message (H) burst uplink. The M uplink burst (as contained in the Manual on VDL Mode 3 Technical Specifications) shall consist of three segments, the training sequence followed by the system data and the transmitter ramp down. The H uplink burst (as contained in the Manual on VDL Mode 3 Technical Specifications) shall consist of three segments, the training sequence followed by the handoff check message and the transmitter ramp down.

- (2) Training sequence. Uplink M burst and H burst training sequences shall consist of two components as follows—
 - (a) transmitter ramp up and power stabilisation ; and
 - (b) synchronisation and ambiguity resolution.
- (3) Transmitter ramp-up and power stabilisation . This shall be as defined in paragraph 3(3).
- (4) Synchronisation and ambiguity resolution. The second component of the training sequence shall consist of the synchronisation sequence, known as S_2^* , as follows—

000 001 101 100 110 010 111 100 010 011 101 000 111 000
011 001

and shall be transmitted from left to right.

Note.— The sequence S_2^ is very closely related to the sequence S_2 . The 15 phase changes between the 16 symbols of S_2^* are each exactly 180° out of phase from the 15 phase changes associated with S_2 . This relationship can be used to simplify the process of simultaneously searching for both sequences.*

- (5) System data and handoff check message. The non-3T configuration (as contained in the Manual on VDL Mode 3 Technical Specifications) system data shall consist of 32 transmitted symbols. The 96 transmitted bits shall include 48 bits of information and 48 parity bits, generated as 4 Golay (24, 12) code words. The 3T configuration as contained in the Manual on VDL Mode 3 Technical Specifications shall consist of 128 transmitted symbols. The 384 transmitted bits shall include 192 bits of information and 192 parity bits, generated as 16 Golay (24, 12) code words. The 3T configuration handoff check message shall consist of 40 transmitted symbols. The 120 transmitted bits shall include 60 bits of information and 60 parity bits, generated as 5 Golay (24,12) code words. The specific definition of the Golay encoder shall be as follows: If the 12 bit input bit sequence is written as a row vector x , then

the 24 bit output sequence can be written as the row vector y , where $y = x G$, and the matrix G shall be given by

$$\mathbf{G} = \begin{matrix}
 1 & 1 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 1 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
 1 & 0 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\
 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\
 0 & 0 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\
 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\
 1 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1
 \end{matrix}$$

Note.— The extended Golay code allows for the correction of any error pattern with 3 or fewer bit errors and the detection of any 4-bit error pattern.

- (6) Transmitter ramp-down. The transmitter power shall be -20 dBc within 2.5 symbol periods of the middle of the final symbol of the burst. The transmitter power leakage when the transmitter is in the “off” State shall be less than -83 dBm.
- (7) *Management (M) burst downlink.* The M downlink burst (as contained in the Manual on VDL Mode 3 Technical Specifications) shall consist of three segments, the training sequence followed by the system data and the transmitter ramp down.
- (8) *Training sequence.* The M downlink burst training sequence shall consist of two components as follows—
 - (a) transmitter ramp up and power stabilisation ; and
 - (b) synchronisation and ambiguity resolution.

- (9) Transmitter ramp-up and power stabilisation . This shall be as defined in paragraph 7(12).
- (10) Synchronisation and ambiguity resolution. Three separate synchronisation sequences shall be used for this burst type. The standard sequence, known as S_1 , shall be as follows—

000 111 001 001 010 110 000 011 100 110 011 111 010 101
100 101

and shall be transmitted from left to right. The special sequence used to identify poll responses shall be as defined in paragraph 7(3).

The special sequence used to identify net entry requests (S_1^*) shall use the following sequence-

000 001 111 111 100 000 110 101 010 000 101 001 100 011
010 011

and shall be transmitted from left to right.

Note.— The sequence S_1^ is very closely related to the sequence S_1 . The 15 phase changes between the 16 symbols of S_1^* are each exactly 180° out of phase from the 15 phase changes associated with S_1 . This relationship can be used to simplify the process of simultaneously searching for both sequences.*

- (11) System data. The system data segment shall consist of 16 transmitted symbols. The 48 transmitted bits shall be encoded as 24 bits of system data and 24 bits of parity bits generated as two consecutive (24, 12) Golay code words. The encoding of the (24, 12) Golay code words should be as defined in paragraph 7(6).
- (12) Transmitter ramp-down. This shall be as defined in paragraph 7(5).
- (13) Voice or data (V/D) burst. The V/D burst (as contained in the Manual on VDL Mode 3 Technical Specifications) shall consist

of four segments: the training sequence followed by the header, the user information segment and the transmitter ramp down. The same V/D burst format shall be used for both uplink and downlink.

- (14) Training sequence. V/D burst training sequence shall consist of two components as follows—
 - (a) transmitter ramp-up and power stabilisation ; and
 - (b) synchronisation and ambiguity resolution.
- (15) Transmitter ramp-up and power stabilisation . This shall be as specified in paragraph 7(12).
- (16) Synchronisation and ambiguity resolution. The second component of the training sequence shall consist of the synchronisation sequence, known as S_2 , as follows—

000 111 011 010 000 100 001 010 100 101 011 110 001 110
101 111

and shall be transmitted from left to right.

- (17) Header. The header segment shall consist of 8 transmitted symbols. The 24 transmitted bits shall be encoded as 12 bits of header information and 12 parity bits, generated as a single (24, 12) Golay code word. The encoding of the (24, 12) Golay code word shall be as defined in paragraph 7(5).
- (18) User information. The user information segment shall consist of 192 3-bit symbols. When transmitting voice, FEC shall be applied to the analysis output of the vocoder specified in 6.8. The vocoder shall provide satisfactory performance in a BER environment of 10⁻³ (with a design goal of 10⁻²). The overall bit rate of the vocoder *including FEC* is 4 800 bits/s (except when in the truncated mode in which the bit rate is 4 000 bits/s).
- (19) When transmitting user data, the 576 bits shall be encoded as a single Reed-Solomon (72, 62) 28-ary code word. For user data input to the Reed-Solomon encoder of length less than 496 bits,

input data shall be padded with zeroes at the end to a full length of 496 bits. The field defining the primitive polynomial of the code shall be as described in paragraph 3(10).

The generator polynomial shall be as follows—

$$\prod_{i=120}^{129} (x - \alpha^i)$$

Note.— The Reed-Solomon (72, 62) code is capable of correcting up to five 28-ary (code word) symbol errors in the received word.

(20) *Transmitter ramp-down.* This shall be as defined in paragraph 7(6).

(21) *Interleaving.* There shall be no interleaving in Mode 3 operation.

(22) Bit scrambling. Under Mode 3 operation, bit scrambling, as specified in paragraph 3(17) shall be performed on each burst, starting after the training sequence. The scrambling sequence shall be reinitialised on each burst effectively providing a constant overlay for each of the Mode 3 fixed length bursts.

(a) Receiver/transmitter interaction. The switching times in this subparagraph will be defined as the time between the middle of the last information symbol of one burst and the middle of the first symbol of the synchronisation sequence of the subsequent burst.

(b) Receiver to transmitter switching time. An aircraft radio shall be capable of switching from reception to transmission within 17 symbol periods. This time can be relaxed to 33 symbol periods for aircraft radios which do not functions requiring discrete addressing.

8. **Transmitter to receiver switching time.**

An aircraft radio shall be capable of switching from transmission to reception within 32 symbol periods.

9. Fringe coverage indication

Indication of near edge-of-coverage shall be provided to the VDL Mode 3 aircraft.

SCHEDULE 8

Regulation 54(b)

VDL MODE 4

1. Physical layer protocols and services

Note.— Unless otherwise stated, the requirements defined in this Schedule apply to both mobile and ground stations.

Functions

(1) Transmitted power

(a) Airborne installation. The effective radiated power shall be such as to provide a field strength of at least 35 microvolts per metre (minus 114.5 dBW/m²) on the basis of free space propagation, at ranges and altitudes appropriate to the conditions pertaining to the areas over which the aircraft is operated.

(b) Ground installation.

The effective radiated power shall be such as to provide a field strength of at least 75 microvolts per metre (minus 109 dBW/m²) within the defined operational coverage of the facility, on the basis of free-space propagation.

(1) Transmitter and receiver frequency control

The VDL Mode 4 physical layer shall set the transmitter or receiver frequency as commanded by the link management entity (LME). Channel selection time shall be less than 13 ms after the receipt of a command from a VSS user.

(2) Data reception by receiver

The receiver shall decode input signals and forward them to the higher layers for processing.

(4) Data transmission by transmitter

- (a) Data encoding and transmission. The physical layer shall encode the data received from the data link layer and transmit it over the RF channel. RF transmission shall take place only when permitted by the MAC.
- (b) Order of transmission. The transmission shall consist of the following stages in the following order—
 - (ii) transmitter power stabilisation ;
 - (iii) bit synchronisation ;
 - (iv) ambiguity resolution and data transmission; and
 - (v) transmitter decay.
- (c) Automatic transmitter shutdown. A VDL Mode 4 station shall automatically shut-down power to any final stage amplifier in the event that output power from that amplifier exceeds -30 dBm for more than 1 second. Reset to an operational mode for the affected amplifier shall require a manual operation.

Note.— This is intended to protect the shared channel resource against so-called “stuck transmitters”.

2. Notification services

- (1) Signal quality. The operational parameters of the equipment shall be monitored at the physical layer. Signal quality analysis shall be performed in the demodulator process and in the receive process.

Note.— Processes that may be evaluated in the demodulator include bit error rate (BER), signal to noise ratio (SNR), and timing jitter. Processes that may be evaluated in the receiver include received signal level and group delay.

- (2) Arrival time. The arrival time of each received transmission shall be measured with a two-sigma error of 5 microseconds.

- (3) The receiver shall be capable of measuring the arrival time within a two-sigma error of 1 microsecond.

3. Protocol definition for GFSK

- (1) *Modulation scheme.* The modulation scheme shall be GFSK. The first bit transmitted (in the training sequence) shall be a high tone and the transmitted tone shall be toggled before transmitting a 0 (i.e. non-return to zero inverted encoding).
- (2) *Modulation rate.* Binary ones and binary zeros shall be generated with a modulation index of 0.25 ± 0.03 and a BT product of 0.28 ± 0.03 , producing data transmission at a bit rate of $19\,200 \text{ bits/s} \pm 50 \text{ ppm}$.

4. Stages of transmission

- (1) *Transmitter power stabilisation .* The first segment of the training sequence is the transmitter power stabilisation , which shall have a duration of 16 symbol periods. The transmitter power level shall be no less than 90 percent of the steady State power level at the end of the transmitter power stabilisation segment.
- (2) *Bit synchronisation .* The second segment of the training sequence shall be the 24-bit binary sequence 0101 0101 0101 0101 0101 0101, transmitted from left to right immediately before the start of the data segment.
- (3) *Ambiguity resolution and data transmission.* The transmission of the first bit of data shall start 40 bit intervals (approximately 2083.3 microseconds) ± 1 microsecond after the nominal start of transmission.
- (4) *Transmitter decay.* The transmitted power level shall decay at least by 20 dB within 300 microseconds after completing a transmission. The transmitter power level shall be less than -90 dBm within 832 microseconds after completing a transmission.

5. Channel sensing

- (1) Estimation of noise floor. A VDL Mode 4 station shall estimate the noise floor based on power measurements of the channel whenever a valid training sequence has not been detected.
- (2) The algorithm used to estimate the noise floor shall be such that the estimated noise floor shall be lower than the maximum power value measured on the channel over the last minute when the channel is regarded as idle.
- (3) Channel idle to busy detection. A VDL Mode 4 station shall employ the following means to determine the channel idle to busy transition at the physical layer.
 - (a) detection of a training sequence. The channel shall be declared busy if a VDL Mode 4 station detects a valid training sequence followed by a frame flag.
 - (b) measurement of channel power. Regardless of the ability of the demodulator to detect a valid training sequence, a VDL Mode 4 station shall consider the channel busy with at least a 95 per cent probability within 1ms after on channel power rises to the equivalent of at least four times the estimated noise floor for at least 0.5 milliseconds.

6. Channel busy to idle detection

- (1) A VDL Mode 4 station shall employ the following means to determine the channel busy to idle transition.
- (2) Measurement of transmission length. When the training sequence has been detected, the channel busy State shall be held for a period of time at least equal to 5 milliseconds, and subsequently allowed to transition to the idle State based on measurement of channel power.
- (3) Measurement of channel power. When not otherwise held in the channel busy State, a VDL Mode 4 station shall consider the channel idle with at least a 95 percent probability if on-channel

power falls below the equivalent of twice the estimated noise floor for at least 0.9 milliseconds.

7. Receiver/transmitter interaction

- (1) Receiver to transmitter turnaround time. A VDL Mode 4 station shall be capable of beginning the transmission of the transmitter power stabilisation sequence within 16 microseconds after terminating the receiver function.
- (2) Frequency change during transmission. The phase acceleration of the carrier from the start of the synchronisation sequence to the data end flag shall be less than 300 Hz per second.
- (3) Transmitter to receiver turnaround time. A VDL Mode 4 station shall be capable of receiving and demodulating with nominal performance an incoming signal within 1 ms after completing a transmission.

8. Physical layer system parameters

The Parameter P1 (Minimum Transmission Length)—

- (1) A receiver shall be capable of demodulating a transmission of minimum length P1 without degradation of BER.
- (2) The value of P1 shall be 19 200 bits.

9. Parameter P2 (Normal Co-channel interference performance)

- (1) The parameter P2 shall be the nominal co-channel interference at which a receiver shall be capable of demodulating without degradation in BER.
- (2) The value of P2 shall be 12 dB.

10. FM Broadcast interference immunity performance for VDL Mode 4 receiving systems

- (1) A VDL Mode 4 station shall conform to the requirements defined in paragraph 6 of Schedule 6 when operating in the band 117.975–137 MHz.

- (2) A VDL Mode 4 station shall conform to the requirements defined below when operating in the band 108-117.975 MHz.
- (3) The VDL Mode 4 receiving system shall meet the requirements specified in paragraph 5(1) of Schedule 6 in the presence of two signal, third-order intermodulation products caused by VHF FM broadcast signals having levels in accordance with the following—

$$2N_1 + N_2 + 72 \leq 0$$

for VHF FM sound broadcasting signals in the range 107.7–108.0 MHz

and

$$2N_1 + N_2 + 3 \left\{ 24 - 20 \log \frac{\Delta f}{0.4} \right\} \leq 0$$

for VHF FM sound broadcasting signals below 107.7 MHz,

where the frequencies of the two VHF FM sound broadcasting signals produce, within the receiver, a two-signal, third-order intermodulation product on the desired VDL Mode 4 frequency.

N_1 and N_2 are the levels (dBm) of the two VHF FM sound broadcasting signals at the VDL Mode 4 receiver input. Neither level shall exceed the desensitisation criteria set forth in subparagraph (4).

$\Delta f = 108.1 - f_1$, where f_1 is the frequency of N_1 , the VHF FM sound broadcasting signal closer to 108.1 MHz.

Note.— The FM intermodulation immunity requirements are not applied to a VDL Mode 4 channel operating below 108.1 MHz, and hence frequencies below 108.1 MHz are not intended for general assignments.

- (4) The VDL Mode 4 receiving system shall not be desensitised in the presence of VHF FM broadcast signals having levels in accordance with Tables 8-1

Table 8-1 VDL Mode 4 operating on frequencies between 112.0–117.975 MHz

| Frequency (MHz) | Maximum level of unwanted signal at receiver input (dBm) |
|-----------------|--|
| 88–104 | +15 |
| 106 | +10 |
| 107 | +5 |
| 107.9 | 0 |

Note.— The relationship is linear between adjacent points designated by the above frequencies.

Notes

1. *Note.— Details on link layer functions are contained in the Manual on VDL Mode 4 Technical Specifications.*
2. *Note.— Details on subnetwork layer functions and SNDCF are contained in the Manual on VDL Mode 4 Technical Specifications.*
3. *Note.— Details on ADS-B application functions are contained in the Manual on VDL Mode 4 Technical Specifications.*

SCHEDULE 9

Regulation 55

VHF AIR GROUND DIGITAL LINK SYSTEMS

Link Layer Protocols and Services

1. Functionality.

The VDL link layer shall provide the following sublayer functions—

- (a) media access control (MAC) sublayer, which requires the use of the carrier sense multiple access (CSMA) algorithm for Mode 2 or TDMA for Mode 3;
- (b) a data link service (DLS) sublayer—
 - (i) for Mode 2, the DLS sublayer provides connection-oriented point-to-point links using data link entities (DLE) and connectionless broadcast link over the MAC sublayer; and
 - (ii) for Mode 3, the DLS sublayer provides acknowledged connectionless point-to-point and point-to-multipoint links over a MAC sublayer that guarantees sequencing; and
- (c) a VDL management entity (VME), which establishes and maintains DLEs between the aircraft and the ground-based systems using link management entities (LME). An aircraft VME instantiates a LME for each ground station that it monitors. Similarly, the ground VME instantiates a LME for each aircraft that it monitors.

2. Service

- (1) Connection-oriented. The VDL Mode 2 link layer shall provide a reliable point-to-point service using a connection-oriented DLS sublayer.
- (2) Connectionless. The VDL Mode 2 and 3 link layers shall provide an unacknowledged broadcast service using a connectionless DLS sublayer.

- (3) Acknowledged connectionless. The VDL Mode 3 link layer shall provide an acknowledged point-to-point service using a connectionless DLS sublayer that relies upon the MAC sublayer to guarantee sequencing.

3. MAC sub layer

The MAC sublayer shall provide for the transparent acquisition of the shared communications path. It makes invisible to the DLS sublayer the way in which supporting communications resources are utilised to achieve this.

4. Data link service sublayer

- (1) For Mode 2, the DLS shall support bit-oriented simplex air-ground communications using the aviation VHF link control (AVLC) protocol.

Note.— Specific data link services, parameters and protocol definitions for VDL Mode 2 are contained in the Manual on VDL Mode 2 Technical Specifications.

- (2) For Mode 3, the DLS shall support bit-oriented, priority based, simplex air-ground communications using the acknowledged connectionless data link (A-CLDL) protocol.

Note.— Specific data link services, parameters and protocol definitions for VDL Mode 3 are contained in the Manual on VDL Mode 3 Technical Specifications.

5. VDL management entity

The VME shall provide link establishment, maintenance and disconnection services as well as support parameter modification. Specific VME services, parameter formats and procedures for Modes 2 and 3 are contained in the Manuals on VDL Mode 2 and Mode 3 Technical Specifications.

VHF AIR GROUND DIGITAL LINK SYSTEMS***Subnetwork Layer Protocols and Services*****1. Architecture for Mode 2**

The sub network layer protocol used across the VHF air-ground subnetwork for VDL Mode 2 is referred to as a sub network access protocol (SNAcP) and shall conform to ISO 8208, except as contained in the Manual on VDL Mode 2 Technical Specifications. The SNAcP is contained within the Manual on VDL Mode 2 Technical Specifications as the sub network protocol. If there are any differences between the Manual on VDL Mode 2 Technical Specifications and these Regulations, the Manual on VDL Mode 2 Technical Specifications shall have precedence. On the air-ground interface, the aircraft sub network entity shall act as a DTE and the ground sub network entity shall act as a DCE.

2. Architecture for Mode 3

The sub network layer used across the VHF air-ground sub network for VDL Mode 3 provides the flexibility to simultaneously support multiple sub network protocols. The currently defined options are to support ISO 8473 connectionless network protocol and to support ISO 8208, both as contained in the Manual on VDL Mode 3 Technical Specifications. The Manual on VDL Mode 3 Technical Specifications shall have precedence with respect to any differences with the cited specifications. For the ISO 8208 interface, both the air and ground sub network entities shall act as DCEs.

SCHEDULE 11

Regulation 65

TECHNICAL PROVISIONS RELATING TO INTERNATIONAL GROUND-GROUND DATA INTERCHANGE AT MEDIUM AND HIGHER SIGNALLING RATES

Note.— In this Schedule, the term “unit” means the unit of selective information and is essentially equivalent to the term “bit”.

General

1. In international data interchange of characters, a 7-unit coded character set providing a repertoire of 128 characters and designated as International Alphabet No. 5 (IA-5) shall be used. Compatibility with the 5-unit coded character set of International Telegraph Alphabet No. 2 (ITA-2) shall be ensured where applicable.
2. When paragraph 1 is applied, International Alphabet No. 5 (IA-5) contained in Table 11-1 shall be used.
 - (1) The serial transmission of units comprising an individual character of IA-5 shall be with the low order unit (b1) transmitted first.
 - (2) When IA-5 is used, each character shall include an additional unit for parity in the eighth level position.
 - (3) When the provisions of subparagraph (2) are applied, the sense of the character parity bit shall produce even parity in links which operate on the start-stop principle, and odd parity in links using end-to-end synchronous operations.
 - (4) Character-for-character conversion shall be as listed in Tables 11-2 and 11-3 for all characters which are authorized in the AFTN format for transmission on the AFS in both IA-5 and ITA-2.
 - (5) Characters which appear in only one code set, or which are not authorized for transmission on the AFS shall be as depicted in the code conversion tables.

3. Data transmission characteristics

(1) The data signaling rate shall be chosen from among the following—

| | |
|--------------|--------------|
| 1 600 bits/s | 4 800 bits/s |
| 1 200 bits/s | 9 600 bits/s |
| 2 400 bits/s | |

(2) The type of transmission for each data signaling rate shall be chosen as follows—

| Data signaling rate | Type of transmission |
|---------------------|---|
| 1 600 bits/s | Synchronous or asynchronous serial transmission |
| 1 200 bits/s | Synchronous or asynchronous serial transmission |
| 2 400 bits/s | Synchronous serial transmission |
| 4 800 bits/s | Synchronous serial transmission |
| 7 600 bits/s | Synchronous serial transmission |

(3) The type of modulation for each data signaling rate shall be chosen as follows—

| Data signaling rate | Type of modulation |
|---------------------|--------------------|
| 1 600 bits/s | Frequency |
| 1 200 bits/s | Frequency |
| 2 400 bits/s | Phase |
| 4 800 bits/s | Phase |
| 9 600 bits/s | Phase-amplitude |

Note.—This standard does not necessarily apply to ground-ground extensions of air-ground links used exclusively for the transfer of air-ground data, in as much as such circuits may be considered as part of the air-ground link.

4. Character structure on data links

(a) Character parity shall not be used for error checking on CIDIN links. Parity appended to IA-5 coded characters as prescribed in paragraph 2(2) prior to entry to the CIDIN shall be ignored. For messages exiting the CIDIN, parity shall be generated in accordance with paragraph 2(3).

- (b) Characters of less than eight bits in length shall be padded out to eight bits in length before transmission over any octet-based or bit-oriented communications network. The padding bits shall occupy the higher order end of the octet, i.e. bit 8, bit 7 as required, and shall have the binary values 0.
- (c) When exchanging data over CIDIN links using bit-oriented procedures, the entry centre address, exit centre addresses and destination addresses in the Transport and CIDIN Packet Headers shall be in the IA-5 character set contained in Table 11-1.
- (d) When transmitting messages in AFTN format over CIDIN links using bit-oriented procedures, the messages shall be in the IA-5 character set contained in Table 11-1.

5. Ground-ground character-oriented data link control procedures

Note.— The provisions of this Schedule apply to ground-ground data interchange applications using IA-5 and which employ the ten transmission control characters (SOH, STX, ETX, EOT, ENQ, ACK, DLE, NAK, SYN, and ETB) for data link control, over synchronous or asynchronous transmission facilities.

- (1) In this Schedule, unless the context otherwise requires—
 - (a) “master station” means station that has control of the data link at a given instant;
 - (b) “slave station” means station that has been selected to receive a transmission from the master station;
 - (c) “control station” means the single station on a multipoint link that is permitted to assume master status and deliver messages to one or more individually selected (non-control) tributary stations, or is permitted to assign temporary master status to any of the other tributary stations.
- (2) Message composition
 - (a) a transmission shall consist of characters from IA-5 transmitted in accordance with paragraph 2(2) and shall be either an information message or a supervisory sequence.

- (b) an information message used for the exchange of data shall take one of the following forms—

| | | | | |
|----|---|------------|---|---|
| 1) | S | | E | B |
| | T | ---TEXT--- | T | C |
| | X | | X | C |

| | | | | |
|----|---|------------|---|---|
| 2) | S | | E | B |
| | T | ---TEXT--- | T | C |
| | X | | B | C |

| | | | | | | |
|----|---|---------------|---|------------|---|---|
| 3) | S | | S | | E | B |
| | T | ---HEADING--- | T | ---TEXT--- | T | C |
| | X | | X | | X | C |

| | | | | | | |
|----|---|---------------|---|------------|---|---|
| 4) | S | | S | | E | B |
| | O | ---HEADING--- | T | ---TEXT--- | T | C |
| | H | | X | | B | C |

| | | | | |
|----|---|---------------|---|---|
| 5) | S | | E | B |
| | O | ---HEADING--- | T | C |
| | H | | B | C |

- c) a supervisory sequence shall be composed of either a single transmission control character (EOT, ENQ, ACK or NAK) or a single transmission control (ENQ) preceded by a prefix of up to 15 non-control characters, or the character DLE used in conjunction with other graphic and control characters to provide additional communication control functions.
- (3) Three system categories are specified on the basis of their respective circuit characteristics, terminal configurations, and message transfer procedures as follows—
- (a) System category A: two-way alternate, multipoint allowing either centralized or non-centralized operation and single or multiple message-oriented information transfers without replies (but with delivery verification);

- (b) System category B: two-way simultaneous, point-to-point employing message associated blocking and modulo 8 numbering of blocks and acknowledgements.
 - (c) System category C: two-way alternate, multipoint allowing only centralized (computer-to-terminal) operation, single or multiple message transfers with replies.
- (4) In addition to the characteristics prescribed in this paragraph for both system categories A and B in subparagraph (3), other parameters that shall be accounted for in order to ensure viable, operationally reliable communications include—
- (a) the number of SYN characters required to establish and maintain synchronization;
 - (b) the values of system time-outs for such functions as “idle line” and “no response” as well as the number of automatic retries that are to be attempted before manual intervention is signaled;
 - (c) the composition of prefixes within a 15 character maximum.
- (5) For multipoint implementations designed to permit only centralized (computer-to terminal) operations, the provisions of paragraph 18 shall apply.

6. Block check character

- (1) Both system category A and B referred to in subparagraph (3) shall utilize a block check character to determine the validity of a transmission.
- (2) The block check character shall be composed of 7 bits plus a parity bit.
- (3) Each of the first 7 bits of the block check character shall be the modulo 2 binary sum of every element in the same bit 1 to bit 7 column of the successive characters of the transmitted block.
- (4) The longitudinal parity of each column of the block, including the block check character, shall be even.

- (5) The sense of the parity bit of the block check character shall be the same as for the information characters.

7. Summation

- (1) The summation to obtain the block check character shall be started by the first appearance of either SOH (start of heading) or STX (start of text).
- (2) The starting character shall not be included in the summation.
- (3) If an STX character appears after the summation has been started by SOH, then the STX character shall be included in the summation as if it were a text character.
- (4) Except for SYN (synchronous idle), all the characters which are transmitted after the start of the block check summation shall be included in the summation, including the ETB (end of transmission/block) or ETX (end of text) control character which signals that the following character is the block check character.
- (5) No character, SYN or otherwise, shall be inserted between the ETB or ETX character and the block check character.

8. Description of system category A

System category A is one in which a number of stations are connected by a multipoint link and one station is permanently designated as the control station which monitors the link at all times to ensure orderly operation.

9. Link establishment procedure

- (1) To establish the link for transmission, the control station shall either—
 - (a) poll one of the tributary stations to assign it master status;
or
 - (b) assume master status and select one or more tributary (slave) stations to receive a transmission.
- (2) Polling shall be accomplished by the control station sending a polling supervisory sequence consisting of a prefix identifying a single tributary station and ending in ENQ.

- (3) A tributary station detecting its assigned polling supervisory sequence shall assume master status and respond in one of two ways—
 - (a) if the station has a message to send, it shall initiate a selection supervisory sequence as described in subparagraph (5);
 - (b) if the station has no message to send, it shall send EOT, and master status shall revert to the control station.
- (4) If the control station detects an invalid or no response resulting from a poll, it shall terminate by sending EOT prior to resuming polling or selection.
- (5) Selection shall be accomplished by the designated master station sending a selection supervisory sequence consisting of a prefix identifying a single station and ending in ENQ.
- (6) A station detecting its assigned selection supervisory sequence shall assume slave status and send one of two replies—
 - (a) if the station is ready to receive, it shall send a prefix followed by ACK. Upon detecting this reply, the master station shall either select another station or proceed with message transfer;
 - (b) if the station is not ready to receive, it shall send a prefix followed by NAK and thereby relinquish slave status. If the master station receives NAK, or no reply, it shall either select another or the same tributary station or terminate;
 - (c) it shall be permissible for N retries ($N \geq 0$) to be made to select a station for which NAK, an invalid reply, or no response has been received.
- (7) If one or more stations have been selected and have properly responded with ACK, the master station shall proceed with message transfer.

10. Message transfer procedure

- (1) The master station shall send a message or series of messages, with or without headings to the selected slave station(s).

- (2) The transmission of a message shall—
 - (a) begin with—
 - (i) SOH if the message has a heading; or
 - (ii) STX if the message has no heading;
 - (b) be continuous, ending with ETX, immediately followed by a block check character (BCC).
- (3) After transmitting one or more messages, the master station shall verify successful delivery at each selected slave station.

11. Deliver verification procedure

- (1) The master station shall send a delivery verification supervisory sequence consisting of a prefix identifying a single slave station and ending in ENQ.
- (2) A slave station detecting its assigned delivery verification supervisory sequence shall send one of two replies—
 - (a) if the slave station properly received all of the transmission, it shall send an optional prefix followed by ACK;
 - (b) if the slave station did not receive all of the transmission properly, it shall send an optional prefix followed by NAK.
- (3) If the master station receives no reply or an invalid reply, it shall request a reply from the same or another slave station until all selected stations have been properly accounted for.
- (4) If the master station receives a negative reply (NAK) or, after $N \geq 0$ repeat attempts, no reply, it shall repeat that transmission to the appropriate slave stations at a later opportunity.
- (5) After all messages have been sent and delivery verified, the master station shall proceed with link termination.

12. Link termination procedure

The terminate function, negating the master or slave status of all stations and returning master status to the control station, shall be accomplished by the master station transmitting EOT.

13. Description of system category B

System category B is one in which two stations are on a point-to-point, full-duplex link and each station has the capability to maintain concurrent master and slave status, i.e. master status on its transmit side and slave status on its receive side and both stations can transmit simultaneously.

14. Link establishment procedure

- (1) To establish the link for message transfers (from the calling to the called station), the calling station shall request the identity of the called station by sending an identification supervisory sequence consisting of a DLE character followed by a colon character, an optional prefix, and ENQ.
- (2) The called station, upon detecting ENQ, shall send one of two replies—
 - (a) if ready to receive, it shall send a sequence consisting of a DLE followed by a colon, a prefix which includes its identity and ended by ACK0. This establishes the link for message transfers from the calling to the called station;
 - (b) if not ready to receive, it shall send the above sequence with the ACK0 replaced by NAK.
- (3) Establishment of the link for message transfers in the opposite direction can be initiated at any time following circuit connection in a similar manner to that described above.

15. Message transfer procedure

- (1) System category B message transfer provides for message associated blocking with longitudinal checking and modulo 8 numbered acknowledgements.
- (2) It is permissible for a transmission block to be a complete message or a portion of a message. The sending station shall initiate the transmission with SOTB N followed by—
 - (a) SOH if it is the beginning of a message that contains a heading;
 - (b) STX if it is the beginning of a message that has no heading;

- (c) SOH if it is an intermediate block that continues a heading;
- (d) STX if it is an intermediate block that continues a text.

Note.— SOTB N is the two-character transmission control sequence DLE = (characters 1/0, and 3/13) followed by the block number, N, where N is one of the IA-5 characters 0, 1 ... 7 (characters 3/0, 3/1 ... 3/7).

- (3) A block which ends at an intermediate point within a message shall be ended with ETB; a block which ends at the end of a message shall be ended with ETX.
- (4) It shall be permissible for each station to initiate and continue to send messages to the other concurrently according to the following sequence.
- (5) It shall be permissible for the sending station (master side) to send blocks, containing messages or parts of messages, continuously to the receiving station (slave side) without waiting for a reply.
- (6) It shall be permissible for replies, in the form of slave responses, to be transmitted by the receiving station while the sending station is sending subsequent blocks.

Note.— By use of modulo 8 numbering of blocks and replies, it shall be permissible for the sending station to send as many as seven blocks ahead of the received replies before being required to stop transmission until six or less blocks are outstanding.

- (7) If a negative reply is received, the sending station (master side) shall start retransmission with the block following the last block for which the proper affirmative acknowledgement was received.
- (8) Slave responses shall be according to one of the following—
 - (a) if a transmission block is received without error and the station is ready to receive another block, it shall send DLE, a colon, an optional prefix, and the appropriate acknowledgement ACKN (referring to the received block beginning with SOTB N, e.g. ACK0, transmitted

as DLE0 is used as the affirmative reply to the block numbered SOTB0, DLE1 for SOTB1, etc.);

- (b) if a transmission block is not acceptable, the receiving station shall send DLE, a colon, an optional prefix, and NAK.
- (9) Slave responses shall be interleaved between message blocks and transmitted at the earliest possible time.

16. Link termination procedure

- (1) If the link has been established for message transfers in either or both directions, the sending of EOT by a station shall signal the end of message transfers in that direction. To resume message transfers after sending EOT, the link shall be re-established in that direction.
- (2) EOT shall only be transmitted by a station after all outstanding slave responses have been received or otherwise accounted for.

17. Circuit disconnection

On switched connections, the data links in both directions shall be terminated before the connection is cleared. In addition, the station initiating clearing of the connection shall first announce its intention to do so by transmitting the two-character sequence DLE EOT, followed by any other signals required to clear the connection.

18. Description of system category C (centralized)

System category C (centralized) is one (like system category A) in which a number of stations are connected by a multipoint link and one station is designated as the control station but (unlike system category A) provides only for centralized (computer-to-terminal) operations where message interchange (with replies) shall be constrained to occur only between the control and a selected tributary station.

19. Link establishment procedure

- (1) To establish the link for transmission the control station shall either—
 - (a) poll one of the tributary stations to assign it master status;
 - or

- (b) assume master status and select a tributary station to assume slave status and receive a transmission according to either of two prescribed selection procedures—
 - (i) selection with response; or
 - (ii) fast select.
- (2) Polling is accomplished by the control station sending a polling supervisory sequence consisting of a prefix identifying a single tributary station and ending in ENQ.
- (3) A tributary station detecting its assigned polling supervisory sequence shall assume master status and respond in one of two ways—
 - (a) if the station has a message to send, it shall initiate message transfer. The control station assumes slave status;
 - (b) if the station has no message to send, it shall send EOT and master status shall revert to the control station.
- (4) If the control station detects an invalid or no response resulting from a poll, it shall terminate by sending EOT prior to resuming polling or selection.
- (5) Selection with response is accomplished by the control station assuming master status and sending a selection supervisory sequence consisting of a prefix identifying a single tributary station and ending in ENQ.
- (6) A tributary station detecting its assigned selection supervisory sequence shall assume slave status and send one of two replies—
 - (a) if the station is ready to receive, it shall send an optional prefix followed by ACK. Upon detecting this reply, the master station shall proceed with message transfer;
 - (b) if the station is not ready to receive, it shall send an optional prefix followed by NAK. Upon detecting NAK, it shall be permissible for the master station to again attempt selecting the same tributary station or initiate termination by sending EOT.

Note.—If the control station receives an invalid or no reply, it is permitted to attempt again to select the same tributary or after N retries ($N \geq 0$) either to exit to a recovery procedure or to initiate termination by sending EOT.

- (7) Fast select is accomplished by the control station assuming master status and sending a selection supervisory sequence, and without ending this transmission with ENQ or waiting for the selected tributary to respond, proceeding directly to message transfer.

20. Message transfer procedure

- (1) The station with master status shall send a single message to the station with slave status and wait for a reply.
- (2) The message transmission shall begin with—
 - (a) SOH if the message has a heading, — STX if the message has no heading; and
 - (b) be continuous, ending with ETX, immediately followed by BCC.
- (3) The slave station, upon detecting ETX followed by BCC, shall send one of two replies:
 - (a) if the messages were accepted and the slave station is ready to receive another message, it shall send an optional prefix followed by ACK. Upon detecting ACK, the master station shall be permitted either to transmit the next message or initiate termination;
 - (b) if the message was not accepted and the slave station is ready to receive another message, it shall send an optional prefix followed by NAK. Upon detecting NAK, the master station may either transmit another message or initiate termination. Following the NAK reply, the next message transmitted need not be a retransmission of the message that was not accepted.
- (4) If the master station receives an invalid or no reply to a message, it shall be permitted to send a delivery verification supervisory sequence consisting of an optional prefix followed by ENQ. Upon receipt of a delivery verification supervisory sequence, the slave station repeats its last reply.

- (5) N retries ($N \geq 0$) may be made by the master station in order to get a valid slave reply. If a valid reply is not received after N retries, the master station exits to a recovery procedure.

21. Link termination procedure

The station with master status shall transmit EOT to indicate that it has no more messages to transmit. EOT shall negate the master/slave status of both stations and return master status to the control station.

22. Ground-ground bit-oriented data link control procedures

Note.— The provisions of this Schedule apply to ground-ground data interchange applications using bit-oriented data link control procedures enabling transparent, synchronous transmission that is independent of any encoding; data link control functions are accomplished by interpreting designated bit positions in the transmission envelope of a frame.

The following descriptions shall apply to data link applications contained in this Schedule—

- (a) Bit-oriented data link control procedures shall enable transparent transmission that is independent of any encoding.
- (b) “a data link” means the logical association of two interconnected stations, including the communication control capability of the interconnected stations;
- (c) “a station” means a configuration of logical elements, from or to which messages are transmitted on a data link, including those elements which control the message flow on the link via communication control procedures;
- (d) “data communication control procedures” means the means used to control and protect the orderly interchange of information between stations on a data link;
- (e) “component” means a number of bits in a prescribed order within a sequence for the control and supervision of the data link;
- (f) “an octet” means a group of 8 consecutive bits;
- (g) “sequence” means one or more components in prescribed order comprising an integral number of octets;

- (h) “a field” means a series of a specified number of bits or specified maximum number of bits which performs the functions of data link or communications control or constitutes data to be transferred;
- (i) “a frame” means a unit of data to be transferred over the data link, comprising one or more fields in a prescribed order;
- (j) “common ICAO data interchange network (CIDIN) switching centre” means a part of an automatic AFTN switching centre which provides for the entry, relay, and exit centre functions using the bit-oriented link and CIDIN network procedures specified in this Schedule and includes the appropriate interface(s) with other parts of the AFTN and with other networks;
- (k) A combined station shall send and receive both commands and responses and shall be responsible for control of the data link.

PART B—BIT-ORIENTED DATA LINK CONTROL PROCEDURES FOR POINT-TO-POINT, GROUND-GROUND DATA INTERCHANGE APPLICATIONS EMPLOYING SYNCHRONOUS TRANSMISSION FACILITIES

1. Frame format. Frames shall contain not less than 32 bits, excluding the opening and closing flags, and shall conform to the following format-

| | | | | | |
|-----------|--------------|--------------|------------------|-----|-----------|
| FLAG F | ADDRESS A | CONTROL C | INFORMATION I | FCS | FLAG F |
|-----------|--------------|--------------|------------------|-----|-----------|

- (1) A frame shall consist of an opening flag (F), an address field (A), a control field (C), an optional information field (I), a frame check sequence (FCS), and a closing flag sequence (F), and shall be transmitted in that order.
- (2) The flag (F) shall be the 8-bit sequence 01111110 which delimits the beginning and ending of each frame. It shall be permissible for the closing flag of a frame to also serve as the opening flag of the next frame.
- (3) The address (A) field shall consist of one octet, excluding 0 bits added to achieve transparent transmission, which shall contain the link address of the combined station.

- (4) The control (C) field shall consist of one octet, excluding 0 bits added to achieve transparent transmission, and shall contain the commands, responses, and frame sequence number components for the control of the data link.
- (5) The information (I) field shall contain digital data which may be presented in any code or sequence but shall not exceed a maximum of 259 octets, excluding 0 bits added to achieve transparent transmission. The (I) field shall always be a multiple of 8 bits in length.
- (6) The frame check sequence (FCS) shall consist of two octets, excluding 0 bits added to achieve transparent transmission, and shall contain the error detecting bits.
- (7) A frame check sequence (FCS) shall be included in each frame for the purpose of error checking.
- (8) The error checking algorithm shall be a cyclic redundancy check (CRC).
- (9) The CRC polynomial (P(x)) shall be—
- (10) The FCS shall be a 16-bit sequence. This FCS shall be the ones' complement of the remainder, R(x), obtained from the modulo 2 division of—

$$x^{16} + x^{12} + x^5 + 1.$$

$$x^{16} [G(x)] + x^K (x^{15} + x^{14} + x^{13} + \dots + x^2 + x^1 + 1)$$

by the CRC polynomial, P(x).

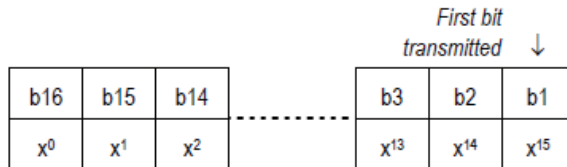
G(x) shall be the contents of the frame existing between, but including neither, the final bit of the opening flag nor the first bit of the FCS, excluding bits inserted for transparent transmission.

K shall be the length of G(x) (number of bits).

- (11) The generation and checking of the FCS accumulation shall be as follows—
 - (a) the transmitting station shall initiate the FCS accumulation with the first (least significant) bit of the address (A) field

and shall include all bits up to and including the last bit preceding the FCS sequence, but shall exclude all 0 bits (if any) inserted to achieve transparent transmission;

- (b) upon completion of the accumulation the FCS shall be transmitted, starting with bit b1 (highest order coefficient) and proceeding in sequence to bit b16 (lowest order coefficient) as shown below—



- (c) the receiving station shall carry out the cyclic redundancy check (CRC) on the content of the frame commencing with the first bit received following the opening flag and shall include all bits up to and including the last bit preceding the closing flag, but shall exclude all 0 bits (if any) deleted according to the rules for achievement of transparency.
 - (d) upon completion of the FCS accumulation, the receiving station shall examine the remainder. In the absence of transmission error, the remainder shall be 1111000010111000(x^0 through x^{15} , respectively).
- (12) Achievement of transparency. The frame format contents (A, C, link data field, and FCS) shall be capable of containing any bit configuration.
- (13) The following rules shall apply to all frame contents, except flag sequences—
- (a) the transmitting station shall examine the frame contents before transmission, and shall insert a single 0 bit immediately following each sequence of 5 consecutive 1 bits;
 - (b) the receiving station shall examine the received frame contents for patterns consisting of 5 consecutive 1 bits

immediately followed by one (or more) 0 bit(s) and shall remove the 0 bit which directly follows 5 consecutive 1 bits.

- (14) Special transmission sequences and related link States. In addition to employing the prescribed repertoire of commands and responses to manage the interchange of data and control information, stations shall use the following conventions to signal the indicated conditions—
- (a) abort is the procedure by which a station in the process of sending a frame ends the frame in an unusual manner such that the receiving station shall ignore the frame. The conventions for aborting a frame shall be—
 - (i) transmitting at least seven, but less than fifteen, one bits (with no inserted zeros);
 - (ii) receiving seven one bits;
 - (b) active link State. A link is in an active State when a station is transmitting a frame, an abort sequence, or interframe time fill. When the link is in the active State, the right of the transmitting station to continue transmission shall be reserved;
 - (c) interframe time fill. Interframe time fill shall be accomplished by transmitting continuous flags between frames. There is no provision for time fill within a frame;
 - (d) idle link State. A link is in an idle State when a continuous one condition is detected that persists for 15 bit times, or longer. Idle link time fill shall be a continuous one condition on the link;
 - (e) invalid frame. An invalid frame is one that is not properly bounded by two flags or one which is shorter than 32 bits between flags.

2. Modes

- (1) Operational mode. The operational mode shall be the asynchronous balanced mode (ABM).

- (2) It shall be permissible for a combined station in ABM to transmit without invitation from the associated station.
- (3) A combined station in ABM shall be permitted to transmit any command or response type frame except DM.
- (4) Non-operational mode. The non-operational mode shall be the asynchronous disconnected mode (ADM) in which a combined station is logically disconnected from the data link.
- (5) It shall be permissible for a combined station in ADM to transmit without invitation from the associated station.
- (6) A combined station in ADM shall transmit only SABM, DISC, UA and DM frames.
- (7) A combined station in ADM shall transmit a DM when a DISC is received, and shall discard all other received command frames except SABM. If a discarded command frame has the P bit set to "1", the combined station shall transmit a DM with the F bit set to "1".
- (8) Control field functions and parameters. Control fields contain a command or a response and sequence numbers where applicable. Three types of control fields shall be used to perform—
 - (a) numbered information transfer (I-frames);
 - (b) numbered supervisory functions (S-frames); and
 - (c) unnumbered control functions (U-frames).
- (9) The control field formats shall be as shown in Table 11-5. The functional frame designation associated with each type control field as well as the control field parameters employed in performing these functions shall be described in subparagraph (10), (11) and (12).
- (10) The I-frame type is used to perform information transfers. Except for some special cases it is the only format which shall be permitted to contain an information field.
- (11) The S-frame type is used for supervisory commands and responses that perform link supervisory control functions such

as acknowledge information frames, request transmission or retransmission of information frames, and to request a temporary suspension of transmission of I-frames. No information field shall be contained in the S-frame.

- (12) The U-frame type is used for unnumbered commands and responses that provide additional link control functions. One of the U-frame responses, the frame reject (FRMR) response, shall contain an information field; all other frames of the U-frame type shall not contain an information field.
- (13) The station parameters associated with the three control field types referred to in subparagraph (10), (11) and (12) shall be as follows—
 - (a) Modulus. Each I-frame shall be sequentially numbered with a send sequence count, $N(S)$, having value 0 through modulus minus one (where modulus is the modulus of the sequence numbers). The modulus shall be 8. The maximum number of sequentially numbered I-frames that a station shall have outstanding (i.e. unacknowledged) at any given time shall never exceed one less than the modulus of the sequence numbers. This restriction on the number of outstanding frames is to prevent any ambiguity in the association of transmission frames with sequence numbers during normal operation or error recovery;
 - (b) The send State variable $V(S)$ shall denote the sequence number of the next in-sequence I-frame to be transmitted—
 - (i) the send State variable shall take on the value 0 through modulus minus one (modulus is the modulus of the sequence numbering and the numbers cycle through the entire range);
 - (ii) the value of $V(S)$ shall be incremented by one with each successive in-sequence I-frame transmission, but shall not exceed the value of $N(R)$ contained in the last received frame by more than the maximum permissible number of outstanding I-frames (k). See i) below for the definition of k .

- (c) Prior to transmission of an in-sequence I-frame, the value of $N(S)$ shall be updated to equal the value of $V(S)$.
- (d) The receive State variable $V(R)$ shall denote the sequence number of the next in-sequence I-frame to be received—
 - (i) $V(R)$ shall take on the values 0 through modulus minus one;
 - (ii) the value of $V(R)$ shall be incremented by one after the receipt of an error-free, in-sequence I-frame whose send sequence number $N(S)$, equals $V(R)$.
- (e) All I-frames and S-frames shall contain $N(R)$, the expected sequence number of the next received frame. Prior to transmission of either an I or an S type frame, the value of $N(R)$ shall be updated to equal the current value of the receive State variable. $N(R)$ indicates that the station transmitting the $N(R)$ has correctly received all I-frames numbered up to and including $N(R) - 1$.
- (f) Each station shall maintain an independent send State variable, $V(S)$, and receive State variable, $V(R)$, on the I-frames it sends and receives. That is, each combined station shall maintain a $V(S)$ count on the I-frames it transmits and a $V(R)$ count on the I-frames it has correctly received from the remote combined station.
- (g) The poll (P/F) bit shall be used by a combined station to solicit (poll) a response or sequence of responses from the remote combined station.
- (h) The final (P/F) bit shall be used by the remote combined station to indicate the response frame transmitted as the result of a soliciting (poll) command.
- (i) The maximum number (k) of sequentially numbered I-frames that a station may have outstanding (i.e. unacknowledged) at any given time is a station parameter which shall never exceed the modulus.

Note.— k is determined by station buffering limitations and should be the subject of bilateral agreement at the time of circuit establishment.

- (14) Commands and responses. It shall be permissible for a combined station to generate either commands or responses. A command shall contain the remote station address while a response shall contain the sending station address. The mnemonics associated with all the commands and responses prescribed for each of the three frame types (I, S, and U) and the corresponding encoding of the control field are as shown in Table 11-6.
- (15) The I-frame command provides the means for transmitting sequentially numbered frames, each of which shall be permitted to contain an information field.
- (16) The S-frame commands and responses shall be used to perform numbered supervisory functions (such as acknowledgement, polling, temporary suspension of information transfer, or error recovery).
- (17) The receive ready command or response (RR) shall be used by a station to—
 - (a) indicate that it is ready to receive an I-frame;
 - (b) acknowledge previously received I-frames numbered up to and including $N(R) - 1$;
 - (c) clear a busy condition that was initiated by the transmission of RNR.

Note.— It is permissible for a combined station to use the RR command to solicit a response from the remote combined station with the poll bit set to “1”.

- (18) It shall be permissible to issue a reject command or response (REJ) to request retransmission of frames starting with the I-frame numbered $N(R)$ where—
 - (a) I-frames numbered $N(R) - 1$ and below are acknowledged;
 - (b) additional I-frames pending initial transmission are to be transmitted following the retransmitted I-frame(s);
 - (c) only one REJ exception condition, from one given station to another station, shall be established at any given time; another REJ shall not be issued until the first REJ exception condition has been cleared;

- (d) the REJ exception condition is cleared (reset) upon the receipt of an I-frame with an N(S) count equal to the N(R) of the REJ command/response.
- (19) The receive not ready command or response (RNR) shall be used to indicate a busy condition, i.e. temporary inability to accept additional incoming I-frames, where—
- (a) frames numbered up to and including $N(R) - 1$ are acknowledged;
 - (b) frame $N(R)$ and any subsequent I-frames received, if any, are not acknowledged (the acceptance status of these frames shall be indicated in subsequent exchanges);
 - (c) the clearing of a busy condition shall be indicated by the transmission of an RR, REJ, SABM, or UA with or without the P/F bit set to “1”.
 - (d) a station receiving an RNR frame when in the process of transmitting shall stop transmitting I-frames at the earliest possible time;
 - (e) any REJ command or response which was received prior to the RNR shall be actioned before the termination of transmission;
 - (f) it shall be permissible for a combined station to use the RNR command with the poll bit set to “1” to obtain a supervisory frame with the final bit set to “1” from the remote combined station.
- (20) It shall be permissible for the selective reject command or response (SREJ) to be used to request retransmission of the single I-frame numbered $N(R)$ where—
- (a) frames numbered up to $N(R) - 1$ are acknowledged; frame $N(R)$ is not accepted; the only I-frames accepted are those received correctly and in sequence following the I-frame requested; the specific I-frame to be retransmitted is indicated by the $N(R)$ in the SREJ command/response;

- (b) the SREJ exception condition is cleared (reset) upon receipt of an I-frame with an N(S) count equal to the N(R) of the SREJ;
 - (c) after a station transmits a SREJ it is not permitted to transmit SREJ or REJ for an additional sequence error until the first SREJ error condition has been cleared;
 - (d) I-frames that have been permitted to be transmitted following the I-frame indicated by the SREJ are not retransmitted as the result of receiving a SREJ; and
 - (e) it is permissible for additional I-frames pending initial transmission to be transmitted following the retransmission of the specific I-frame requested by the SREJ.
- (21) The U-frame commands and responses shall be used to extend the number of link control functions. Transmitted U-frames do not increment the sequence counts at either the transmitting or receiving station—
- (a) The U-frame mode-setting commands (SABM, and DISC) shall be used to place the addressed station in the appropriate response mode (ABM or ADM) where—
 - (i) upon acceptance of the command, the station send and receive State variables, V(S) and V(R), are set to zero;
 - (ii) the addressed station confirms acceptance at the earliest possible time by transmission of a single unnumbered acknowledgement, UA;
 - (iii) previously transmitted frames that are unacknowledged when the command is actioned remain unacknowledged;
 - (iv) the DISC command is used to perform a logical disconnect, i.e. to inform the addressed combined station that the transmitting combined station is suspending operation. No information field shall be permitted with the DISC command.

- (b) The unnumbered acknowledge response (UA) shall be used by a combined station to acknowledge the receipt and acceptance of an unnumbered command. Received unnumbered commands are not actioned until the UA response is transmitted. No information field shall be permitted with the UA response.
- (c) The frame reject response (FRMR), employing the information field described below, shall be used by a combined station in the operational mode (ABM) to report that one of the following conditions resulted from the receipt of a frame without an FCS error—
 - (i) a command/response that is invalid or not implemented;
 - (ii) a frame with an information field that exceeds the size of the buffer available;
 - (iii) a frame having an invalid N(R) count.

Note.— An invalid N(R) is a count which points to an I-frame which has previously been transmitted and acknowledged or to an I-frame which has not been transmitted and is not the next sequential I-frame pending transmission.

- (d) The disconnected mode response (DM) shall be used to report a non-operational status where the station is logically disconnected from the link. No information field shall be permitted with the DM response.

Note.— The DM response shall be sent to request the remote combined station to issue a mode-setting command or, if sent in response to the reception of a mode-setting command, to inform the remote combined station that the transmitting station is still in ADM and cannot action the mode-setting command.

3. Exception condition reporting and recovery

- (1) This paragraph specifies the procedures that shall be employed to effect recovery following the detection or occurrence of an exception condition at the link level. Exception conditions described are those situations that may occur as the result

of transmission errors, station malfunction, or operational situations.

- (2) Busy condition. A busy condition occurs when a station temporarily cannot receive or continue to receive I-frames due to internal constraints, e.g. due to buffering limitations. The busy condition shall be reported to the remote combined station by the transmission of an RNR frame with the N(R) number of the next I-frame that is expected. It shall be permissible for traffic pending transmission at the busy station to be transmitted prior to or following the RNR.

Note.— The continued existence of a busy condition must be reported by retransmission of RNR at each P/F frame exchange.

- (3) Upon receipt of an RNR, a combined station in ABM shall cease transmitting I-frames at the earliest possible time by completing or aborting the frame in process. The combined station receiving an RNR shall perform a time-out operation before resuming asynchronous transmission of I-frames unless the busy condition is reported as cleared by the remote combined station. If the RNR was received as a command with the P bit set to “1”, the receiving station shall respond with an S-frame with the F bit set to “1”.
- (4) The busy condition shall be cleared at the station which transmitted the RNR when the internal constraint ceases. Clearance of the busy condition shall be reported to the remote station by transmission of an RR, REJ, SABM, or UA frame (with or without the P/F bit set to “1”).
- (5) N(S) sequence error. An N(S) sequence exception shall be established in the receiving station when an I-frame that is received error free (no FCS error) contains an N(S) sequence number that is not equal to the receive variable V(R) at the receiving station. The receiving station shall not acknowledge (shall not increment its receive variable V(R)) the frame causing the sequence error, or any I-frames which may follow, until an I-frame with the correct N(S) number is received. A station that receives one or more I-frames having sequence errors, but which are otherwise error free, shall accept the control

information contained in the N(R) field and the P/F bit to perform link control functions, e.g. to receive acknowledgement of previously transmitted I-frames (via the N(R)), to cause the station to respond (P bit set to “1”).

- (6) The means specified in subparagraph (7) and (8) shall be available for initiating the retransmission of lost or errored I-frames following the occurrence of a sequence error.
- (7) Where the REJ command/response is used to initiate an exception recovery following the detection of a sequence error, only one “sent REJ” exception condition, from one station to another station, shall be established at a time. A “sent REJ” exception shall be cleared when the requested I-frame is received. A station receiving REJ shall initiate sequential (re) transmission of I-frames starting with the I-frame indicated by the N(R) contained in the REJ frame.

FRMR INFORMATION FIELD BITS FOR BASIC (SABM) OPERATION

First bit transmitted

| | | | | | | | | | | | | | |
|---------------------------|-------|---|------|----|------|----|----|----|----|-------------|----|----|----|
| 1 | 8 | 9 | 10 | 12 | 13 | 14 | 16 | 17 | 18 | 19 | 20 | 21 | 24 |
| Rejected control field | basic | 0 | V(S) | v | V(R) | w | x | y | z | Set to zero | | | |

Where:

- rejected basic control field is the control field of the received frame which caused the frame reject;
- $V(S)$ is the current value of the send state variable at the remote combined station reporting the error condition (bit 10 = low order bit);
- $V(R)$ is the current value of the receive state variable at the remote combined station reporting the error condition (bit 14 = low order bit).
- v set to “1” indicates that the received frame which caused rejection was a response.
- w set to “1” indicates that the control field received and returned in bits 1 through 8 are invalid or not implemented.
- x set to “1” indicates that the control field received and returned in bits 1 through 8 was considered invalid because the frame contained an information field which is not permitted with this command. Bit w must be set to “1” in conjunction with this bit.

- y set to “1” indicates that the information field received exceeded the maximum information field length which can be accommodated by the station reporting the error condition. This bit is mutually exclusive with bits w and x above.
 - z set to “1” indicates that the control field received and returned in bits 1 through 8 contained an invalid $N(R)$ count. This bit is mutually exclusive with bit w .
- (8) In the event a receiving station, due to a transmission error, does not receive (or receives and discards) a single I-frame or the last I-frame(s) in a sequence of I-frames, it shall not detect an out-of-sequence exception and, therefore, shall not transmit REJ. The station which transmitted the unacknowledged I-frame(s) shall, following the completion of a system-specified time-out period, take appropriate recovery action to determine the sequence number at which retransmission must begin.
 - (9) A combined station which has timed out waiting for a response shall not retransmit all unacknowledged frames immediately. The station may enquire about status with a supervisory frame.

Note 1.— If a station does retransmit all unacknowledged I-frames after a time-out, it must be prepared to receive a subsequent REJ frame with an $N(R)$ greater than its send variable $V(S)$.

Note 2.— Since contention may occur in the case of two-way alternate communications in ABM or ADM, the time-out interval employed by one combined station must be greater than that employed by the other combined station so as to permit contention to be resolved.

- (10) FCS error. Any frame with an FCS error shall not be accepted by the receiving station and will be discarded. No action shall be taken by the receiving station as the result of that frame.
- (11) Frame reject exception condition. A frame reject exception condition shall be established upon the receipt of an error-free frame which contains an invalid or unimplemented control field, an invalid $N(R)$, or an information field which has exceeded the maximum established storage capability. If a frame reject exception condition occurs in a combined station, the station shall either—

- (a) take recovery action without reporting the condition to the remote combined station; or
 - (b) report the condition to the remote combined station with a FRMR response. The remote station will then be expected to take recovery action; if, after waiting an appropriate time, no recovery action appears to have been taken, the combined station reporting the frame reject exception condition may take recovery action. Recovery action for balanced operation includes the transmission of an implemented mode-setting command. Higher level functions may also be involved in the recovery.
- (12) Mode-setting contention. A mode-setting contention situation exists when a combined station issues a mode setting command and, before receiving an appropriate response (UA or DM), receives a mode-setting command from the remote combined station. Contention situations shall be resolved in the following manner—
- (a) when the send and receive mode-setting commands are the same, each combined station shall send a UA response at the earliest respond opportunity. Each combined station shall either enter the indicated mode immediately or defer entering the indicated mode until receiving a UA response. In the latter case, if the UA response is not received—
 - (i) the mode may be entered when the response timer expires; or
 - (ii) the mode-setting command may be reissued;
 - (b) when the mode-setting commands are different, each combined station shall enter ADM and issue a DM response at the earliest respond opportunity. In the case of DISC contention with a different mode-setting command, no further action is required.
- (13) Time-out functions. Time-out functions shall be used to detect that a required or expected acknowledging action or response to a previously transmitted frame has not been received. Expiration

of the time-out function shall initiate appropriate action, e.g. error recovery or reissuance of the P bit. The duration of the following time-out functions is system dependent and subject to bilateral agreement—

- (a) combined stations shall provide a time-out function to determine that a response frame with F bit set to “1” to a command frame with the P bit set to “1” has not been received. The time-out function shall automatically cease upon receipt of a valid frame with the F bit set to “1”;
- (b) a combined station which has no P bit outstanding, and which has transmitted one or more frames for which responses are anticipated shall start a time-out function to detect the no-response condition. The time-out function shall cease when an I- or S-frame is received with the N(R) higher than the last received N(R) (acknowledging one or more I-frames).

TABLES

Table 11-1 International Telegraph Alphabets No.2 and No. 3

| Number of signal | Letter case | Figure case | Impulse 5 -unit code | | |
|------------------|-----------------|------------------|----------------------|-------------------------|------|
| | | | Start | 12345 | stop |
| | | | | International code No.2 | |
| 1 | A | | A | ZZAAA | Z |
| 2 | B | ? | A | ZAAZZ | Z |
| 3 | C | : | A | AZZZA | Z |
| 4 | D | Note 1 | A | ZAAZA | Z |
| 5 | E | | A | ZAAAA | Z |
| 6 | F | | A | ZAZZA | Z |
| 7 | G | | A | AZAZZ | Z |
| 8 | H | | A | AAZAZ | Z |
| 9 | I | 8 | A | AZZAA | Z |
| 10 | J | Attention signal | A | ZZAZA | Z |
| 11 | K | (| A | ZZZZA | Z |
| 12 | L |) | A | AZAAZ | Z |
| 13 | M | . | A | AAZZZ | Z |
| 14 | N | , | A | AAZZA | Z |
| 15 | O | 9 | A | AAAZZ | Z |
| 16 | P | 0 | A | AZZAZ | Z |
| 17 | Q | 1 | A | ZZZAZ | Z |
| 18 | R | 4 | A | AZAZA | Z |
| 19 | S | , | A | ZAZAA | Z |
| 20 | T | 5 | A | AAA AZ | Z |
| 21 | U | 7 | A | ZZZAA | Z |
| 22 | V | = | A | AZZZZ | Z |
| 23 | W | 2 | A | ZZAAZ | Z |
| 24 | X | / | A | ZAZZZ | Z |
| 25 | Y | 6 | A | ZAZAZ | Z |
| 26 | Z | + | A | ZAAA Z | Z |
| 27 | Carriage return | | A | AAA ZA | Z |
| 28 | Line feed | | A | AZAAA | Z |
| 29 | Letters | | A | ZZZZZ | Z |
| 30 | Figures | | A | ZZAZZ | Z |

| | | | | | |
|----|-------------------|--|---|-------|---|
| 31 | Space | | A | AAZAA | Z |
| 32 | Unperforated tape | | A | AAAA | Z |
| 33 | Signal repetition | | | | |
| 34 | Signal α | | | | |
| 35 | Signal β | | | | |

| | | |
|-------------|-----------------------|-----------------------|
| <i>Sign</i> | <i>Closed circuit</i> | <i>Double current</i> |
| A | No current | Negative current |
| Z | Positive current | Positive current |

Note 1 – used for answer-back facility

Table 11-2 International Alphabet No. 5 (IA-5)
(International reference version)

| | | | | | | | | | | | | |
|----------------|----------------|----------------|----------------|----------------|--------------------------|--------------------------|----|---|---|---|---|---|
| | | | | b ₇ | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| | | | | b ₆ | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| | | | | b ₅ | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| b ₄ | b ₃ | b ₂ | b ₁ | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 0 | 0 | 0 | NUL (DLE) | TC ₇ | SP | 0 | @ | P | , | p |
| 0 | 0 | 0 | 1 | 1 | TC ₁ (SOH) | DC ₁ | ! | 1 | A | Q | a | q |
| 0 | 0 | 1 | 0 | 2 | TC ₂ (STX) | DC ₂ | “ | 2 | B | R | b | r |
| 0 | 0 | 1 | 1 | 3 | TC ₃ (ETX) | DC ₃ | # | 3 | C | S | c | s |
| 0 | 1 | 0 | 0 | 4 | TC ₄ (EOT) | DC ₄ | □ | 4 | D | T | d | t |
| 0 | 1 | 0 | 1 | 5 | TC ₅ (ENQ) | TC ₈ (NAK) | % | 5 | E | U | e | u |
| 0 | 1 | 1 | 0 | 6 | TC ₆ (ACK) | TC ₉ (SYN) | & | 6 | F | V | f | v |
| 0 | 1 | 1 | 1 | 7 | BEL (ETB) | TC ₁₀ | ‘ | 7 | G | W | g | w |
| 1 | 0 | 0 | 0 | 8 | FE ₀ (BS) | CAN | (| 8 | H | X | h | x |

| | | | | | | | | | | | | |
|---|---|---|---|----|-------------------------|-------------------------|--------|---|---|--------|---|--------|
| 1 | 0 | 0 | 1 | 9 | FE ₁ (HT) | EM |) | 9 | I | Y | i | y |
| 1 | 0 | 1 | 0 | 10 | FE ₂ (LF) | SUB | * | : | J | Z | j | z |
| 1 | 0 | 1 | 1 | 11 | FE ₃ (VT) | ESC | + | ; | K | [| k | { |
| 1 | 1 | 0 | 0 | 12 | FE ₄ (FF) | IS ₄ (FS) | „ , | < | L | \ | l | |
| 1 | 1 | 0 | 1 | 13 | FE ₅ (CR) | IS ₃ (GS) | - | = | M |] | m | } |
| 1 | 1 | 1 | 0 | 14 | SO | IS ₂ (RS) | . | > | N | ^ „ | n | — f |
| 1 | 1 | 1 | 1 | 15 | SI | IS ₁ (US) | / | ? | O | — | o | DEL |

NOTES

Note 1.—The format effectors are intended for equipment in which horizontal and vertical movements are effected separately. If equipment requires the action of CARRIAGE RETURN to be combined with a vertical movement, the format effector for that vertical movement may be used to effect the combined movement. Use of FE 2 for a combined CR and LF operation is not allowed for international transmission on AFS networks.

Note 2.—The symbol □ does not designate the currency of a specific country.

Note 3.—Position 7/14 is used for graphic character $\bar{\text{—}}$ (OVERLINE), the graphical representation of which may vary according to national use to represent (TILDE) or another diacritical sign provided that there is no risk of confusion with another graphic character included in the table.

Note 4.—The graphic characters in position 2/2, 2/7, 2/12 and 5/14 have respectively the significance of QUOTATION MARK, APOSTROPHE, COMMA and UPWARD ARROW HEAD; however, these characters take on the significance of the diacritical signs DIAERESIS, ACUTE ACCENT, CEDILLA and CIRCUMFLEX ACCENT when they are preceded or followed by the BACKSPACE character (0/8).

Note 5.—When graphical representation of the control characters of IA-5 is required, it is permissible to use the symbols specified in International Organization for Standardization (ISO) Standard 2047-1975.

Control characters

| <i>Abbreviation</i> | <i>Meaning</i> | <i>Position in the code table</i> |
|---------------------|---------------------------|-----------------------------------|
| ACK | Acknowledge | 0/6 |
| BEL | Bell | 0/7 |
| BS | Backspace | 0/8 |
| CAN | Cancel | 1/8 |
| CR | Carriage return* | 0/13 |
| DC | Device control | – |
| DEL | Delete | 7/15 |
| DLE | Data link escape | 1/0 |
| EM | End of medium | 1/9 |
| ENQ | Enquiry | 0/5 |
| EOT | End of transmission | 0/4 |
| ESC | Escape | 1/11 |
| ETB | End of transmission block | 1/7 |
| ETX | End of text | 0/3 |
| FE | Format effector | – |
| FF | Form feed | 0/12 |
| FS | File separator | 1/12 |
| GS | Group separator | 1/13 |
| HT | Horizontal tabulation | 0/9 |
| IS | Information separator | – |
| LF | Line feed* | 0/10 |
| NAK | Negative acknowledge | 1/5 |
| NUL | Null | 0/0 |
| RS | Record separator | 1/14 |
| SI | Shift-in | 0/15 |
| SO | Shift-out | 0/14 |
| SOH | Start of heading | 0/1 |
| SP | Space | 2/0 |
| STX | Start of text | 0/2 |
| SUB | Substitute character | 1/10 |
| SYN | Synchronous idle | 1/6 |
| TC | Transmission control | – |
| US | Unit separator | 1/15 |
| VT | Vertical tabulation | 0/11 |

Graphic characters

| <i>Graphic</i> | <i>Note</i> | <i>Name</i> | <i>Position in the code table</i> |
|----------------|-------------|---------------------------|-----------------------------------|
| (space) | | Space (see 7.2) | 2/0 |
| ! | | Exclamation mark | 2/1 |
| “ | 4 | Quotation mark, Diaeresis | 2/2 |
| # | | Number sign | 2/3 |
| ¤ | 2 | Currency sign | 2/4 |
| % | | Percent sign | 2/5 |
| & | | Ampersand | 2/6 |
| ‘ | 4 | Apostrophe, Acute accent | 2/7 |
| (| | Left parenthesis | 2/8 |
|) | | Right parenthesis | 2/9 |
| * | | Asterisk | 2/10 |
| + | | Plus sign | 2/11 |
| , | 4 | Comma, Cedilla | 2/12 |
| – | | Hyphen, Minus sign | 2/13 |
| . | | Full stop (period) | 2/14 |
| / | | Solidus | 2/15 |
| : | | Colon | 3/10 |
| ; | | Semi-colon | 3/11 |
| < | | Less-than sign | 3/12 |
| = | | Equal sign | 3/13 |
| > | | Greater-than sign | 3/14 |
| ? | | Question mark | 3/15 |
| @ | | Commercial ‘at’ | 4/0 |
| [| | Left square bracket | 5/11 |
| \ | | Reverse solidus | 5/12 |
|] | | Right square bracket | 5/13 |

| | | | |
|---|---|---------------------|------|
| | 4 | Upward arrow head | |
| | | Circumflex accent | 5/14 |
| — | | Underline | 5/15 |
| ˘ | | Grave accent | 6/0 |
| { | | Left curly bracket | 7/11 |
| | | Vertical line | 7/12 |
| } | | Right curly bracket | 7/13 |
| ˉ | 3 | Overline, Tilde | 7/14 |

DIACRITICAL SIGNS

In the character set, some printing symbols may be designed to permit their use for the composition of accented letters when necessary for general interchange of information. A sequence of three characters, comprising a letter, BACKSPACE and one of these symbols, is needed for this composition, and the symbol is then regarded as a diacritical sign. It should be noted that these symbols take on their diacritical significance only when they are preceded or followed by the BACKSPACE character: for example, the symbol corresponding to the code combination 2/7 (*) normally has the significance of APOSTROPHE, but becomes the diacritical sign ACUTE ACCENT when it precedes or follows the BACKSPACE character.

NAMES, MEANINGS AND FONTS OF GRAPHIC CHARACTERS

At least one name is assigned to denote each of the graphic characters. These names are intended to reflect their customary meanings and are not intended to define or restrict the meanings of graphic characters. No particular style or font design is specified for the graphic characters.

UNIQUENESS OF CHARACTER ALLOCATION

A character allocated to a position in the table may not be placed elsewhere in the table.

FUNCTIONAL CHARACTERISTICS RELATED TO CONTROL CHARACTERS

Some definitions given below are stated in general terms and more explicit definitions of use may be needed for specific implementation of the code table on recording media or on transmission channels. These more explicit definitions and the use of these characters are the subject of ISO publications.

General designations of control characters

The general designation of control characters involves a specific class name followed by a subscript number.

They are defined as follows:

TC — Transmission *control characters* — Control characters intended to control or facilitate transmission of information over telecommunication networks.

The use of the TC characters on the general telecommunication networks is the subject of ISO publications.

The transmission control characters are:

ACK, DLE, ENQ, EOT, ETB, ETX, NAK, SOH, STX and SYN.

FE — Format *effectors* — Control characters mainly intended for the control of the layout and positioning of information on printing and/or display devices. In the definitions of specific format effectors, any reference to printing devices should be interpreted as including display devices. The definitions of format effectors use the following concept:

- a) a page is composed of a number of lines of characters.
- b) the characters forming a line occupy a number of positions called character positions;
- c) the active position is that character position in which the character about to be processed would appear if it were to be printed. The active position normally advances one-character position at a time.

The format effector characters are:

BS, CR, FF, HT, LF and VT.

DC — Device *control characters* — Control characters for the control of a local or remote ancillary device (or devices) connected to a data processing and/or telecommunication system. These control characters are not intended to control telecommunication systems; this should be achieved by the use of TCs. Certain preferred uses of the individual DCs are given below under *Specific control characters*.

IS — Information *separators* — Control characters that are used to separate and qualify data logically. There are four such characters. They may be used either in hierarchical order or non-hierarchically; in the latter case their specific meanings depend on their applications. When they are used hierarchically, the ascending order is: US, RS, GS, FS. In this case data normally delimited by a particular separator cannot be split by a higher order separator but will be considered as delimited by any higher order separator.

Specific control characters

Individual members of the classes of controls are sometimes referred to by their abbreviated class name and a subscript number (e.g. TC₃) and sometimes by a specific name indicative of their use (e.g. ENQ).

Different but related meanings may be associated with some of the control characters but in an interchange of data this normally requires agreement between the sender and the recipient.

| | | |
|------------------------|---|--|
| ACK | — | <i>Acknowledge</i> — A transmission control character transmitted by a receiver as an affirmative response to the sender. |
| BEL | — | <i>Bell</i> — A control character that is used when there is a need to call for attention; it may control alarm or attention devices. |
| BS | — | <i>Backspace</i> — A format effector which moves the active position one character position backwards on the same line. |
| CAN | — | <i>Cancel</i> — A character, or the first character of a sequence, indicating that the data preceding it are in error. As a result these data are to be |
| | | ignored. The specific meaning of this character must be defined for each application and/or between sender and recipient. |
| CR | — | <i>Carriage return</i> — A format effector which moves the active position to the first character position on the same line. |
| <i>Device controls</i> | | |
| DC ₁ | — | A device control character which is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be |
| | | used to restore a device to the basic mode of operation (<i>see also</i> DC ₂ and DC ₃), or for any other device control function not provided by other DCs. |
| DC ₂ | — | A device control character which is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be |
| | | used to set a device to a special mode of operation (in which case DC ₁ is used to restore the device to the basic mode), or for any other device control function not provided by other DCs. |
| DC ₃ | — | A device control character which is primarily intended for turning off or stopping an ancillary device. This function may be a secondary level stop, e.g. wait, pause, stand-by or halt (in which case DC ₁ is used to restore normal operation). If it is not required for this purpose, it may be used for any other device control function not provided by other DCs. |

| | | |
|-----|---|--|
| DC4 | — | <p>A device control character which is primarily intended for turning off, stopping or interrupting an ancillary device. If it is not required for this purpose, it may be used for any other device control function not provided by other DCs.</p> <p>Examples of use of the device controls</p> <ol style="list-style-type: none"> 1) one switching on - DC₂ off - DC₄ 2) two independent switchings <ul style="list-style-type: none"> first one on - DC₂ off - DC₄ second one on - DC₁ off - DC₃ 3) Two dependent switchings <ul style="list-style-type: none"> General on - DC₂ off - DC₄ Particular on - DC₁ off - DC₃ 4) Input and Output switching <ul style="list-style-type: none"> output on - DC₂ off - DC₄ Input on - DC₁ off - DC₃ |
| DEL | - | <p>Delete — A character used primarily to erase or obliterate an erroneous or unwanted character in punched tape. DEL characters may also serve to accomplish media-fill or time-fill. They may be inserted into or removed from a stream of data without affecting the information content of that stream, but then the addition or removal of these characters may affect the information layout and/or the control of equipment.</p> |
| DLE | - | <p>Data link escape — A transmission control character which will change the meaning of a limited number of contiguously following characters. It is used exclusively to provide supplementary data transmission control functions. Only graphic characters and transmission control characters can be used in DLE sequences.</p> |
| EM | - | <p>End of medium — A control character that may be used to identify the physical end of a medium, or the end of the used portion of a medium, or the end of the wanted portion of data recorded on a medium. The position of this character does not necessarily correspond to the physical end of the medium.</p> |
| ENQ | - | <p>Enquiry — A transmission control character used as a request for a response from a remote station — the response may include station identification and/or station status. When a “Who are you?” function is required on the general switched transmission network, the first use of ENQ after the connection is established shall have the meaning “Who are you?” (station identification). Subsequent use of ENQ may, or may not, include the function “Who are you?”, as determined by agreement.</p> |
| EOT | - | <p>End of transmission — A transmission control character used to indicate the conclusion of the transmission of one or more texts.</p> |
| ESC | - | <p>Escape — A control character which is used to provide an additional control function. It alters the meaning of a limited number of contiguously following bit combinations which constitute the escape sequence. Escape sequences are used to obtain additional control functions which may provide among other things graphic sets outside the standard set. Such control functions must not be used as additional transmission controls. The use of the character ESC and of the escape sequences in conjunction with code extension techniques is the subject of an ISO Standard.</p> |

| | | |
|------------------------|---|--|
| ETB | - | End of transmission block — A transmission control character used to indicate the end of a transmission block of data where data are divided into such blocks for transmission purposes |
| ETX | - | End of text — A transmission control character which terminates a text. |
| FF | - | form feed — A format effector which advances the active position to the same character position on a predetermined line of the next form or page. |
| HT | - | Horizontal tabulation — A format effector which advances the active position to the next predetermined character position on the same line. |
| Information separators | | |
| IS ₁ (US) | - | A control character used to separate and qualify data logically; its specific meaning has to be defined for each application. If this character is used in hierarchical order as specified in the general definition of IS, it delimits a data item called a UNIT |
| IS ₂ (RS) | - | A control character used to separate and qualify data logically; its specific meaning has to be defined for each application. If this character is used in hierarchical order as specified in the general definition of IS, it delimits a data item called a RECORD. |
| IS ₃ (GS) | - | A control character used to separate and qualify data logically; its specific meaning has to be defined for each application. If this character is used in hierarchical order as specified in the general definition of IS, it delimits a data item called a GROUP. |
| IS ₄ (FS) | - | A control character used to separate and qualify data logically; its specific meaning has to be defined for each application. If this character is used in hierarchical order as specified in the general definition of IS, it delimits a data item called a FILE. |
| LF | - | Line feed — A format effector which advances the active position to the same character position of the next line. |
| NAK | - | Negative acknowledge — A transmission control character transmitted by a receiver as a negative response to the sender. |
| NUL | - | Null — A control character used to accomplish media-fill or time-fill. NUL characters may be inserted into or removed from a stream of data without affecting the information content of that stream, but then the addition or removal of these characters may affect the information layout and/or the control of equipment. |
| SI | - | Shift-in — A control character which is used in conjunction with SHIFT-OUT and ESCAPE to extend the graphic character set of the code. It may reinstate the standard meanings of the bit combinations which follow it. The effect of this character when using code extension techniques is described in an ISO Standard. |
| SO | - | Shift-out — A control character which is used in conjunction with SHIFT-IN and ESCAPE to extend the graphic character set of the code. It may alter the meaning of the bit combinations of columns 2 to 7 which follow it until a SHIFT-IN character is reached. However, the characters SPACE (2/0) and DELETE (7/15) are unaffected by SHIFT-OUT. The effect of this character when using code extension techniques is described in an ISO Standard. |
| SOH | - | Start of heading — A transmission control character used as the first character of a heading of an information message. |
| SP | - | Space — A character which advances the active position one character position on the same line. This character is also regarded as a nonprinting graphic |

| | | |
|-----|----|--|
| STX | - | Start of text — A transmission control character which precedes a text and which is used to terminate a heading. |
| SUB | -- | Substitute character — A control character used in the place of a character that has been found to be invalid or in error. SUB is intended to be introduced by automatic means. |
| SYN | - | Synchronous idle — A transmission control character used by a synchronous transmission system in the absence of any other character (idle condition) to provide a signal from which synchronism may be achieved or retained between data terminal equipment. |
| VT | - | Vertical tabulation — A format effector which advances the active position to the same character position on the next predetermined line. |

Table 11-3. Conversion from the International Telegraph Alphabet No. 2 (ITA-2) to the International Alphabet No. 5 (IA-5)

| ITA-2 Letter case of signal No. | | IA-5 Column/row | | ITA-2 figure case of signal No. | | IA-5 column/row | |
|---------------------------------|---|-----------------|---|---------------------------------|---|-----------------|-----|
| 1 | A | 4/1 | A | 1 | | 2/13 | - |
| 2 | B | 4/2 | B | 2 | ? | 3/15 | ? |
| 3 | C | 4/3 | C | 3 | : | 3/10 | : |
| 4 | D | 4/4 | D | 4 | | 3/15 | ? |
| 5 | E | 4/5 | E | 5 | 3 | 3/3 | 3 |
| | | | | | | | |
| 6 | F | 4/6 | F | 6 | | | ? |
| 7 | G | 4/7 | G | 7 | | | ? |
| 8 | H | 4/8 | H | 8 | | | ? |
| 9 | I | 4/9 | I | 9 | | | 8 |
| 10 | J | 4/10 | J | 10 Attention signal (Note 3) | | 0/7 | Bel |
| | | | | | | | |
| 11 | K | 4/11 | K | 11 | (| 2/8 | (|
| 12 | L | 4/12 | L | 12 |) | 2/9 |) |
| 13 | M | 4/13 | M | 13 | . | 2/14 | . |
| 14 | N | 4/14 | N | 14 | , | 2/12 | , |
| 15 | O | 4/15 | O | 15 | 9 | 3/9 | 9 |
| | | | | | | | |
| 16 | P | 5/0 | P | 16 | 0 | 2/8 | 0 |
| 17 | Q | 5/1 | Q | 17 | 1 | 2/9 | 1 |
| 18 | R | 5/2 | R | 18 | 4 | 2/14 | 4 |

| | | | | | | | |
|----|------|------|----|----|---|------|----|
| 19 | S | 5/3 | S | 19 | , | 2/12 | , |
| 20 | T | 5/4 | T | 20 | 5 | 3/9 | 5 |
| | | | | | | | |
| 21 | U | 5/5 | U | 21 | 7 | 3/7 | 7 |
| 22 | V | 5/6 | V | 22 | = | 3/13 | = |
| 23 | W | 5/7 | W | 23 | 2 | 3/2 | 2 |
| 24 | X | 5/8 | X | 24 | / | 2/15 | / |
| 25 | Y | 5/9 | Y | 25 | 6 | 3/6 | 6 |
| | | | | | | | |
| 26 | Z | 5/10 | Z | 26 | | 2/11 | + |
| 27 | CR | 0/13 | CR | 27 | | 0/13 | CR |
| 28 | LF | 0/10 | LF | 28 | | 0/13 | LF |
| 29 | LTRS | * | | 29 | | * | |
| 30 | FIGS | * | | 30 | | * | |
| | | | | | | | |
| 31 | SP | 2/0 | SP | SP | | 2/0 | SP |
| 32 | | * | | | | * | |

** No conversion shall be made for these positions and the signal/character shall be removed from the data.*

Note 1.— The end-of-message signal NNNN (in letter and figure case) shall convert to ETX (0/3).

Note 2.— The start-of-message signal ZCZC (in letter and figure case) shall convert to SOH (0/1).

Note 3.— Figures case of Signal No. 10 shall only be converted upon detection of the AFTN priority alarm which shall convert to five occurrences of BEL (0/7).

Note 4.— When converting from ITA-2, a STX (0/2) character shall be inserted once at the beginning of the next line following detection of CR LF or LF CR at the end of the Origin Line.

Note 5.— The sequence of seven signal 28 (LF) shall convert to one VT (0/11) character.

Table 11-4. Conversion from the International Alphabet No. 5 (IA-5) to the International Telegraph Alphabet No. 2 (ITA-2)

| Col. Row | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------|--------|---|------|-----|-----|-----|-----|-----|
| 0 | * | * | 31FL | 16F | 2F | 16L | 2F | 16L |
| 1 | Note 5 | * | 2F | 17F | 1L | 17L | 1L | 17L |
| 2 | * | * | 2F | 23F | 2L | 18L | 2L | 18L |
| 3 | Note 1 | * | 2F | 5F | 3L | 19L | 3L | 19L |
| 4 | * | * | 2F | 18F | 4L | 20L | 4L | 20L |
| 5 | * | * | 2F | 20F | 5L | 21L | 5L | 21L |
| 6 | * | * | 2F | 25F | 6L | 22L | 6L | 22L |
| 7 | Note 2 | * | 19F | 21F | 7L | 23L | 7L | 23L |
| 8 | * | * | 11F | 9F | 8L | 24L | 8L | 24L |
| 9 | * | * | 12F | 15F | 9L | 25L | 9L | 25L |
| 10 | 28 FL | * | 2F | 3F | 10L | 26L | 10L | 26L |
| 11 | Note 3 | * | 26F | 2F | 11L | 2F | 11L | 2F |
| 12 | * | * | 14F | 2F | 12L | 2F | 12L | 2F |
| 13 | 27FL | * | 1F | 22F | 13L | 2F | 13L | 2F |
| 14 | * | * | 13F | 2F | 14L | 2F | 14L | 2F |
| 15 | * | * | 24F | 2F | 15L | 2F | 15L | * |

* No conversion shall be made for these positions and the signal/character shall be removed from the data.

Example: To find the ITA-2 signal to which the character 3/6 of IA-5 is to be converted, look at column 3, row 6. 25F means figure case of signal No. 25 (L = letter case, FL = either case designation).

Note 1.—The character 0/3 (ETX) shall convert to the ITA-2 sequence signals 14L, 14L, 14L, 14L (NNNN).

Note 2. — The signal 0/7 (BEL) shall only be converted when a sequence of 5 occurrences is detected, which shall convert to the ITA-2 sequence signals 30, 10F, 10F, 10F, 10F, 10F, 29.

Note 3. — The character sequence CR CR LF VT (0/11) ETX (0/3) shall convert to the ITA-2 sequence signals 29, 27, 27, 28, 28, 28, 28, 28, 28, 28, 28, 14L, 14L, 14L, 14L.

Note 4. — To prevent redundant generation of figure and letter characters in ITA-2 when converting from IA-5, no case designation shall be assigned to ITA-2 non-printing functions (signals No. 27, 28, 29, 30, 31).

Note 5. —The character 0/1 (SOH) shall convert to the ITA-2 sequence signals 26L, 3L, 26L, 3L (ZCZC).

Table 11-5 Control field formats

| Control field format for | Control field bits | | | | | | | |
|--|--------------------|------|---|---|-----|------|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Information transfer (I frame) | 0 | N(S) | | | P | N(R) | | |
| Supervisory commands/responses (S frame) | 1 | 0 | S | S | P/F | N(R) | | |
| Unnumbered commands/responses | 1 | 1 | M | M | P/F | M | M | M |

where:

N(S) = send sequence count (bit 2 = low order bit)

N(R) = receive sequence count (bit 6 = low order bit)

S = supervisory function bits

M = modifier function bits

P = poll bit (in commands)

F = final bit (in responses)

Table 11-6 Commands and responses

| Type | Commands | Responses | C field encoding | | | | | | | |
|----------------------|---------------------------------------|--------------------------------|------------------|------|---|---|-----|------|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Information transfer | I (information) | | 0 | N(S) | | | P | N(R) | | |
| | RR (receive ready) | RR (receive ready) | 1 | 0 | 0 | 0 | P/F | N(R) | | |
| Supervisory | RNR (receive not ready) | RNR (receive not ready) | 1 | 0 | 1 | 0 | P/F | N(R) | | |
| | REJ (reject) | REJ (reject) | 1 | 0 | 0 | 1 | P/F | N(R) | | |
| Unnumbered | | DM (disconnected mode) | 1 | 1 | 1 | 1 | P/F | 0 | 0 | 0 |
| | SABM (set asynchronous balanced mode) | | 1 | 1 | 1 | 1 | P | 1 | 0 | 0 |
| | DISC (disconnect) | | 1 | 1 | 0 | 0 | P | 0 | 1 | 0 |
| | | UA (unnumbered acknowledgment) | 1 | 1 | 0 | 0 | F | 1 | 1 | 0 |
| | | FRMR (frame reject) | 1 | 1 | 1 | 0 | F | 0 | 0 | 1 |

SCHEDULE 12

Regulation 66

WORLDWIDE SCHEME FOR THE ALLOCATION, ASSIGNMENT AND APPLICATION OF AIRCRAFT ADDRESSES

1. General

Global communications, navigation and surveillance systems shall use an individual aircraft address composed of 24 bits. At any one time, no address shall be assigned to more than one aircraft. The assignment of aircraft addresses requires a comprehensive scheme providing for a balanced and expandable distribution of aircraft addresses applicable worldwide.

2. Description of the scheme

Table 12 provides for blocks of consecutive addresses available to States for assignment to aircraft. Each block is defined by a fixed pattern of the first 4, 6, 9, 12 or 14 bits of the 24-bit address. Thus, blocks of different sizes (1 048 576, 262 144, 32 768, 4 096 and 1 024 consecutive addresses, respectively) are made available.

3. Allocation of aircraft addresses

- (1) Blocks of aircraft addresses allocated by ICAO to the State of Registry or common mark registering authority and address allocations to States shall be as shown in Table 12.
- (2) The authority shall notify ICAO when allocation to Uganda of an additional block of addresses is required for assignment to aircraft.
- (3) In considering a notification under subparagraph (2), ICAO shall take advantage of blocks of aircraft addresses not yet allocated and the spare blocks shall be distributed on the basis of the relevant ICAO region—
 - (a) Addresses starting with bit combination 00100: AFI region;
 - (b) Addresses starting with bit combination 00101: SAM region;
 - (c) Addresses starting with bit combination 0101: EUR and NAT regions;

- (d) Addresses starting with bit combination 01100: MID region;
 - (e) Addresses starting with bit combination 01101: ASIA region;
 - (f) Addresses starting with bit combination 1001: NAM and PAC regions;
 - (g) Addresses starting with bit combination 111011: CAR region;
 - (h) In addition, aircraft addresses starting with bit combinations 1011, 1101 and 1111 have been reserved for future use.
- (4) The authority shall request for additional aircraft addresses where at least 75 per cent of the number of addresses already allocated to the authority have been assigned to aircraft.

4. Assignment of aircraft addresses

The authority shall use its allocated block of addresses to assign an individual aircraft address to each suitably equipped aircraft entered on a national register (Table 12).

Note.— For an aircraft delivery, the aircraft operator is expected to inform the airframe manufacturer of an address assignment. The airframe manufacturer or other organisation responsible for a delivery flight is expected to ensure installation of a correctly assigned address supplied by the State of Registry or common mark registering authority. Exceptionally, a temporary address may be supplied under the arrangements detailed in paragraph 8.

5. Aircraft addresses shall be assigned to aircraft in accordance with the following principles—
- (a) at any one time, no address shall be assigned to more than one aircraft with the exception of aerodrome surface vehicles on surface movement areas. If such exceptions are applied by the State of Registry, the vehicles which have been allocated the same address shall not operate on aerodromes separated by less than 1 000 km;

- (b) only one address shall be assigned to an aircraft, irrespective of the composition of equipment on board. In the case when a removable transponder is shared by several light aviation aircraft such as balloons or gliders, it shall be possible to assign a unique address to the removable transponder. The registers 0816, 2016, 2116, 2216 and 2516 of the removable transponder shall be correctly updated each time the removable transponder is installed in any aircraft;
- (c) the address shall not be changed except under exceptional circumstances and shall not be changed during flight;
- (d) when an aircraft changes its State of Registry, the new registering State shall assign the aircraft a new address from its own allocation address block, and the old aircraft address shall be returned to the allocation address block of the State that previously registered the aircraft;
- (e) the address shall serve only a technical role for addressing and identification of aircraft and shall not be used to convey any specific information; and
- (f) the addresses composed of 24 ZEROS or 24 ONES shall not be assigned to aircraft.

6. Any method used to assign aircraft addresses shall ensure efficient use of the entire address block that is allocated to Uganda.

7. **Application of aircraft addresses**

- (1) The aircraft addresses shall be used in applications which require the routing of information to or from individual suitably equipped aircraft.

Note 1.— Examples of such applications are the aeronautical telecommunication network (ATN), SSR Mode S and airborne collision avoidance system (ACAS).

Note 2.— This requirement does not preclude assigning the aircraft addresses for special applications associated with the general applications defined therein. Examples of such special

applications are the utilisation of the 24-bit address in a pseudo-aeronautical earth station to monitor the aeronautical mobile-satellite service ground earth station and in the fixed Mode S transponders (reporting the on-the-ground status as specified the Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations 2019) to monitor the Mode S ground station operation. Address assignments for special applications are to be carried out in conformance with the procedure established by the authority to manage the 24-bit address assignments to aircraft.

- (2) An address consisting of 24 ZEROs shall not be used for any application.

8. Administration of the temporary aircraft address assignments

- (1) Temporary addresses shall be assigned to aircraft in exceptional circumstances, such as when operators have been unable to obtain an address from their individual States of Registry or Common Mark Registering Authority in a timely manner. ICAO shall assign temporary addresses from the block “ICAO1” shown in Table 12.
- (2) When requesting a temporary address, the aircraft operator shall supply to ICAO: aircraft identification, type and make of aircraft, name and address of the operator, and an explanation of the reason for the request.
- (3) Upon issuance of the temporary address to the aircraft operators, ICAO shall inform the State of Registry of the issuance of the temporary address, reason and duration.
- (4) The aircraft operator shall—
 - (a) inform the State of Registry of the temporary assignment and reiterate the request for a permanent address; and
 - (b) inform the airframe manufacturer.
- (5) When the permanent aircraft address is obtained from the State of Registry, the operator shall—
 - (a) inform ICAO without delay;

- (b) relinquish his or her temporary address; and
- (c) arrange for encoding of the valid unique address within 180 calendar days.
- (6) If a permanent address is not obtained within one year, the aircraft operator shall reapply for a new temporary aircraft address. Under no circumstances shall a temporary aircraft address be used by the aircraft operator for over one year.

Table 12 Allocation of aircraft addresses to States

Table 9-1. Allocation of aircraft addresses to States

Note.—The left-hand column of the 24-bit address patterns represents the most significant bit (MSB) of the address

| State | Number of addresses in block | | | | | Allocation of blocks of addresses (a dash represents a bit value equal to 0 or 1) | | | | | |
|--------------------------|------------------------------|-------|--------|---------|-----------|--|----|-----|-----|-----|-------|
| | 1 024 | 4 096 | 32 768 | 262 144 | 1 048 576 | | | | | | |
| Afghanistan | | * | | | | 0111 | 00 | 000 | 000 | --- | ----- |
| Albania | * | | | | | 0101 | 00 | 000 | 001 | 00 | ----- |
| Algeria | | | * | | | 0000 | 10 | 100 | --- | --- | ----- |
| Angola | | * | | | | 0000 | 10 | 010 | 000 | --- | ----- |
| Antigua and Barbuda | * | | | | | 0000 | 11 | 001 | 010 | 00 | ----- |
| Argentina | | | | * | | 1110 | 00 | --- | --- | --- | ----- |
| Armenia | * | | | | | 0110 | 00 | 000 | 000 | 00 | ----- |
| Australia | | | | * | | 0111 | 11 | --- | --- | --- | ----- |
| Austria | | | * | | | 0100 | 01 | 000 | --- | --- | ----- |
| Azerbaijan | * | | | | | 0110 | 00 | 000 | 000 | 10 | ----- |
| Bahamas | | * | | | | 0000 | 10 | 101 | 000 | --- | ----- |
| Bahrain | | * | | | | 1000 | 10 | 010 | 100 | --- | ----- |
| Bangladesh | | * | | | | 0111 | 00 | 000 | 010 | --- | ----- |
| Barbados | * | | | | | 0000 | 10 | 101 | 010 | 00 | ----- |
| Belarus | * | | | | | 0101 | 00 | 010 | 000 | 00 | ----- |
| Belgium | | | * | | | 0100 | 01 | 001 | --- | --- | ----- |
| Belize | * | | | | | 0000 | 10 | 101 | 011 | 00 | ----- |
| Benin | * | | | | | 0000 | 10 | 010 | 100 | 00 | ----- |
| Bhutan | * | | | | | 0110 | 10 | 000 | 000 | 00 | ----- |
| Bolivia | | * | | | | 1110 | 10 | 010 | 100 | --- | ----- |
| Bosnia and Herzegovina | * | | | | | 0101 | 00 | 010 | 011 | 00 | ----- |
| Botswana | * | | | | | 0000 | 00 | 110 | 000 | 00 | ----- |
| Brazil | | | | * | | 1110 | 01 | --- | --- | --- | ----- |
| Brunei Darussalam | * | | | | | 1000 | 10 | 010 | 101 | 00 | ----- |
| Bulgaria | | | * | | | 0100 | 01 | 010 | --- | --- | ----- |
| Burkina Faso | | * | | | | 0000 | 10 | 011 | 100 | --- | ----- |
| Burundi | | * | | | | 0000 | 00 | 110 | 010 | --- | ----- |
| Cambodia | | * | | | | 0111 | 00 | 001 | 110 | --- | ----- |
| Cameroon | | * | | | | 0000 | 00 | 110 | 100 | --- | ----- |
| Canada | | | | * | | 1100 | 00 | --- | --- | --- | ----- |
| Cape Verde | * | | | | | 0000 | 10 | 010 | 110 | 00 | ----- |
| Central African Republic | | * | | | | 0000 | 01 | 101 | 100 | --- | ----- |
| Chad | | * | | | | 0000 | 10 | 000 | 100 | --- | ----- |
| Chile | | * | | | | 1110 | 10 | 000 | 000 | --- | ----- |
| China | | | | * | | 0111 | 10 | --- | --- | --- | ----- |
| Colombia | | * | | | | 0000 | 10 | 101 | 100 | --- | ----- |
| Comoros | * | | | | | 0000 | 00 | 110 | 101 | 00 | ----- |
| Congo | | * | | | | 0000 | 00 | 110 | 110 | --- | ----- |
| Cook Islands | * | | | | | 1001 | 00 | 000 | 001 | 00 | ----- |
| Costa Rica | | * | | | | 0000 | 10 | 101 | 110 | --- | ----- |
| Côte d'Ivoire | | * | | | | 0000 | 00 | 111 | 000 | --- | ----- |
| Croatia | * | | | | | 0101 | 00 | 000 | 001 | 11 | ----- |
| Cuba | | * | | | | 0000 | 10 | 110 | 000 | --- | ----- |
| Cyprus | * | | | | | 0100 | 11 | 001 | 000 | 00 | ----- |
| Czech Republic | | | * | | | 0100 | 10 | 011 | --- | --- | ----- |

| State | Number of addresses in block | | | | | Allocation of blocks of addresses (a dash represents a bit value equal to 0 or 1) | | | | | |
|---------------------------------------|------------------------------|-------|--------|---------|-----------|--|----|-----|-----|----|-------|
| | 1 024 | 4 096 | 32 768 | 262 144 | 1 048 576 | | | | | | |
| Democratic People's Republic of Korea | | | * | | | 0111 | 00 | 100 | --- | -- | ----- |
| Democratic Republic of the Congo | | * | | | | 0000 | 10 | 001 | 100 | -- | ----- |
| Denmark | | | * | | | 0100 | 01 | 011 | --- | -- | ----- |
| Djibouti | * | | | | | 0000 | 10 | 011 | 000 | 00 | ----- |
| Dominican Republic | | * | | | | 0000 | 11 | 000 | 100 | -- | ----- |
| Ecuador | | * | | | | 1110 | 10 | 000 | 100 | -- | ----- |
| Egypt | | | * | | | 0000 | 00 | 010 | --- | -- | ----- |
| El Salvador | | * | | | | 0000 | 10 | 110 | 010 | -- | ----- |
| Equatorial Guinea | | * | | | | 0000 | 01 | 000 | 010 | -- | ----- |
| Eritrea | * | | | | | 0010 | 00 | 000 | 010 | 00 | ----- |
| Estonia | * | | | | | 0101 | 00 | 010 | 001 | 00 | ----- |
| Ethiopia | | * | | | | 0000 | 01 | 000 | 000 | -- | ----- |
| Fiji | | * | | | | 1100 | 10 | 001 | 000 | -- | ----- |
| Finland | | | * | | | 0100 | 01 | 100 | --- | -- | ----- |
| France | | | | * | | 0011 | 10 | --- | --- | -- | ----- |
| Gabon | | * | | | | 0000 | 00 | 111 | 110 | -- | ----- |
| Gambia | | * | | | | 0000 | 10 | 011 | 010 | -- | ----- |
| Georgia | * | | | | | 0101 | 00 | 010 | 100 | 00 | ----- |
| Germany | | | | * | | 0011 | 11 | --- | --- | -- | ----- |
| Ghana | | * | | | | 0000 | 01 | 000 | 100 | -- | ----- |
| Greece | | | * | | | 0100 | 01 | 101 | --- | -- | ----- |
| Grenada | * | | | | | 0000 | 11 | 001 | 100 | 00 | ----- |
| Guatemala | | * | | | | 0000 | 10 | 110 | 100 | -- | ----- |
| Guinea | | * | | | | 0000 | 01 | 000 | 110 | -- | ----- |
| Guinea-Bissau | * | | | | | 0000 | 01 | 001 | 000 | 00 | ----- |
| Guyana | | * | | | | 0000 | 10 | 110 | 110 | -- | ----- |
| Haiti | | * | | | | 0000 | 10 | 111 | 000 | -- | ----- |
| Honduras | | * | | | | 0000 | 10 | 111 | 010 | -- | ----- |
| Hungary | | | * | | | 0100 | 01 | 110 | --- | -- | ----- |
| Iceland | | * | | | | 0100 | 11 | 001 | 100 | -- | ----- |
| India | | | | * | | 1000 | 00 | --- | --- | -- | ----- |
| Indonesia | | | * | | | 1000 | 10 | 100 | --- | -- | ----- |
| Iran, Islamic Republic of | | | * | | | 0111 | 00 | 110 | --- | -- | ----- |
| Iraq | | | * | | | 0111 | 00 | 101 | --- | -- | ----- |
| Ireland | | * | | | | 0100 | 11 | 001 | 010 | -- | ----- |
| Israel | | | * | | | 0111 | 00 | 111 | --- | -- | ----- |
| Italy | | | | * | | 0011 | 00 | --- | --- | -- | ----- |
| Jamaica | | * | | | | 0000 | 10 | 111 | 110 | -- | ----- |
| Japan | | | | * | | 1000 | 01 | --- | --- | -- | ----- |
| Jordan | | | * | | | 0111 | 01 | 000 | --- | -- | ----- |
| Kazakhstan | * | | | | | 0110 | 10 | 000 | 011 | 00 | ----- |
| Kenya | | * | | | | 0000 | 01 | 001 | 100 | -- | ----- |
| Kiribati | * | | | | | 1100 | 10 | 001 | 110 | 00 | ----- |
| Kuwait | | * | | | | 0111 | 00 | 000 | 110 | -- | ----- |
| Kyrgyzstan | * | | | | | 0110 | 00 | 000 | 001 | 00 | ----- |
| Lao People's Democratic Republic | | * | | | | 0111 | 00 | 001 | 000 | -- | ----- |
| Latvia | * | | | | | 0101 | 00 | 000 | 010 | 11 | ----- |

| State | Number of addresses in block | | | | | Allocation of blocks of addresses (a dash represents a bit value equal to 0 or 1) | | | | | |
|---------------------------------|------------------------------|-------|--------|---------|-----------|--|----|-----|-----|----|-------|
| | 1 024 | 4 096 | 32 768 | 262 144 | 1 048 576 | | | | | | |
| Lebanon | | | * | | | 0111 | 01 | 001 | --- | -- | ----- |
| Lesotho | * | | | | | 0000 | 01 | 001 | 010 | 00 | ----- |
| Liberia | | * | | | | 0000 | 01 | 010 | 000 | -- | ----- |
| Libyan Arab Jamahiriya | | | * | | | 0000 | 00 | 011 | --- | -- | ----- |
| Lithuania | * | | | | | 0101 | 00 | 000 | 011 | 11 | ----- |
| Luxembourg | * | | | | | 0100 | 11 | 010 | 000 | 00 | ----- |
| Madagascar | | * | | | | 0000 | 01 | 010 | 100 | -- | ----- |
| Malawi | | * | | | | 0000 | 01 | 011 | 000 | -- | ----- |
| Malaysia | | | * | | | 0111 | 01 | 010 | --- | -- | ----- |
| Maldives | * | | | | | 0000 | 01 | 011 | 010 | 00 | ----- |
| Mali | | * | | | | 0000 | 01 | 011 | 100 | -- | ----- |
| Malta | * | | | | | 0100 | 11 | 010 | 010 | 00 | ----- |
| Marshall Islands | * | | | | | 1001 | 00 | 000 | 000 | 00 | ----- |
| Mauritania | * | | | | | 0000 | 01 | 011 | 110 | 00 | ----- |
| Mauritius | * | | | | | 0000 | 01 | 100 | 000 | 00 | ----- |
| Mexico | | | * | | | 0000 | 11 | 010 | --- | -- | ----- |
| Micronesia, Federated States of | * | | | | | 0110 | 10 | 000 | 001 | 00 | ----- |
| Monaco | * | | | | | 0100 | 11 | 010 | 100 | 00 | ----- |
| Mongolia | * | | | | | 0110 | 10 | 000 | 010 | 00 | ----- |
| Montenegro | * | | | | | 0101 | 00 | 010 | 110 | 00 | ----- |
| Morocco | | | * | | | 0000 | 00 | 100 | --- | -- | ----- |
| Mozambique | | * | | | | 0000 | 00 | 000 | 110 | -- | ----- |
| Myanmar | | * | | | | 0111 | 00 | 000 | 100 | -- | ----- |
| Namibia | * | | | | | 0010 | 00 | 000 | 001 | 00 | ----- |
| Nauru | * | | | | | 1100 | 10 | 001 | 010 | 00 | ----- |
| Nepal | | * | | | | 0111 | 00 | 001 | 010 | -- | ----- |
| Netherlands, Kingdom of the | | | * | | | 0100 | 10 | 000 | --- | -- | ----- |
| New Zealand | | | * | | | 1100 | 10 | 000 | --- | -- | ----- |
| Nicaragua | | * | | | | 0000 | 11 | 000 | 000 | -- | ----- |
| Niger | | * | | | | 0000 | 01 | 100 | 010 | -- | ----- |
| Nigeria | | * | | | | 0000 | 01 | 100 | 100 | -- | ----- |
| Norway | | | * | | | 0100 | 01 | 111 | --- | -- | ----- |
| Oman | * | | | | | 0111 | 00 | 001 | 100 | 00 | ----- |
| Pakistan | | | * | | | 0111 | 01 | 100 | --- | -- | ----- |
| Palau | * | | | | | 0110 | 10 | 000 | 100 | 00 | ----- |
| Panama | | * | | | | 0000 | 11 | 000 | 010 | -- | ----- |
| Papua New Guinea | | * | | | | 1000 | 10 | 011 | 000 | -- | ----- |
| Paraguay | | * | | | | 1110 | 10 | 001 | 000 | -- | ----- |
| Peru | | * | | | | 1110 | 10 | 001 | 100 | -- | ----- |
| Philippines | | | * | | | 0111 | 01 | 011 | --- | -- | ----- |
| Poland | | | * | | | 0100 | 10 | 001 | --- | -- | ----- |
| Portugal | | | * | | | 0100 | 10 | 010 | --- | -- | ----- |
| Qatar | * | | | | | 0000 | 01 | 101 | 010 | 00 | ----- |
| Republic of Korea | | | * | | | 0111 | 00 | 011 | --- | -- | ----- |
| Republic of Moldova | * | | | | | 0101 | 00 | 000 | 100 | 11 | ----- |
| Romania | | | * | | | 0100 | 10 | 100 | --- | -- | ----- |
| Russian Federation | | | | * | | 0001 | -- | --- | --- | -- | ----- |
| Rwanda | | * | | | | 0000 | 01 | 101 | 110 | -- | ----- |

| State | Number of addresses in block | | | | | Allocation of blocks of addresses (a dash represents a bit value equal to 0 or 1) | | | | | |
|--|------------------------------|-------|--------|---------|-----------|--|----|-----|-----|-----|-------|
| | 1 024 | 4 096 | 32 768 | 262 144 | 1 048 576 | | | | | | |
| Saint Lucia | * | | | | | 1100 | 10 | 001 | 100 | 00 | ----- |
| Saint Vincent and the Grenadines | * | | | | | 0000 | 10 | 111 | 100 | 00 | ----- |
| Samoa | * | | | | | 1001 | 00 | 000 | 010 | 00 | ----- |
| San Marino | * | | | | | 0101 | 00 | 000 | 000 | 00 | ----- |
| Sao Tome and Principe | * | | | | | 0000 | 10 | 011 | 110 | 00 | ----- |
| Saudi Arabia | | | * | | | 0111 | 00 | 010 | --- | -- | ----- |
| Senegal | | * | | | | 0000 | 01 | 110 | 000 | -- | ----- |
| Serbia | | | * | | | 0100 | 11 | 000 | --- | --- | ----- |
| Seychelles | * | | | | | 0000 | 01 | 110 | 100 | 00 | ----- |
| Sierra Leone | * | | | | | 0000 | 01 | 110 | 110 | 00 | ----- |
| Singapore | | | * | | | 0111 | 01 | 101 | --- | -- | ----- |
| Slovakia | * | | | | | 0101 | 00 | 000 | 101 | 11 | ----- |
| Slovenia | * | | | | | 0101 | 00 | 000 | 110 | 11 | ----- |
| Solomon Islands | * | | | | | 1000 | 10 | 010 | 111 | 00 | ----- |
| Somalia | | * | | | | 0000 | 01 | 111 | 000 | -- | ----- |
| South Africa | | | * | | | 0000 | 00 | 001 | --- | -- | ----- |
| Spain | | | | * | | 0011 | 01 | --- | --- | -- | ----- |
| Sri Lanka | | | * | | | 0111 | 01 | 110 | --- | -- | ----- |
| Sudan | | * | | | | 0000 | 01 | 111 | 100 | -- | ----- |
| Suriname | | * | | | | 0000 | 11 | 001 | 000 | -- | ----- |
| Swaziland | * | | | | | 0000 | 01 | 111 | 010 | 00 | ----- |
| Sweden | | | * | | | 0100 | 10 | 101 | --- | -- | ----- |
| Switzerland | | | * | | | 0100 | 10 | 110 | --- | -- | ----- |
| Syrian Arab Republic | | | * | | | 0111 | 01 | 111 | --- | -- | ----- |
| Tajikistan | * | | | | | 0101 | 00 | 010 | 101 | 00 | ----- |
| Thailand | | | * | | | 1000 | 10 | 000 | --- | -- | ----- |
| The former Yugoslav Republic of Macedonia | * | | | | | 0101 | 00 | 010 | 010 | 00 | ----- |
| Togo | | * | | | | 0000 | 10 | 001 | 000 | -- | ----- |
| Tonga | * | | | | | 1100 | 10 | 001 | 101 | 00 | ----- |
| Trinidad and Tobago | | * | | | | 0000 | 11 | 000 | 110 | -- | ----- |
| Tunisia | | | * | | | 0000 | 00 | 101 | --- | -- | ----- |
| Turkey | | | * | | | 0100 | 10 | 111 | --- | -- | ----- |
| Turkmenistan | * | | | | | 0110 | 00 | 000 | 001 | 10 | ----- |
| Uganda | | * | | | | 0000 | 01 | 101 | 000 | -- | ----- |
| Ukraine | | | * | | | 0101 | 00 | 001 | --- | -- | ----- |
| United Arab Emirates | | * | | | | 1000 | 10 | 010 | 110 | -- | ----- |
| United Kingdom | | | | * | | 0100 | 00 | --- | --- | -- | ----- |
| United Republic of Tanzania | | * | | | | 0000 | 10 | 000 | 000 | -- | ----- |
| United States | | | | * | | 1010 | -- | --- | --- | -- | ----- |
| Uruguay | | * | | | | 1110 | 10 | 010 | 000 | -- | ----- |
| Uzbekistan | * | | | | | 0101 | 00 | 000 | 111 | 11 | ----- |
| Vanuatu | * | | | | | 1100 | 10 | 010 | 000 | 00 | ----- |
| Venezuela | | | * | | | 0000 | 11 | 011 | --- | -- | ----- |
| Viet Nam | | | * | | | 1000 | 10 | 001 | --- | -- | ----- |
| Yemen | | * | | | | 1000 | 10 | 010 | 000 | -- | ----- |
| Zambia | | * | | | | 0000 | 10 | 001 | 010 | -- | ----- |
| Zimbabwe | * | | | | | 0000 | 00 | 000 | 100 | 00 | ----- |

| State | Number of addresses in block | | | | | Allocation of blocks of addresses (a dash represents a bit value equal to 0 or 1) | | | | | |
|---|------------------------------|-------|--------|---------|-----------|--|-----|-------|-------|-----|-------|
| | 1 024 | 4 096 | 32 768 | 262 144 | 1 048 576 | | | | | | |
| Other allocations | | | | | | | | | | | |
| ICAO ¹ | | | * | | | 1 1 1 1 | 0 0 | 0 0 0 | --- | -- | ----- |
| ICAO ² | * | | | | | 1 0 0 0 | 1 0 | 0 1 1 | 0 0 1 | 0 0 | ----- |
| ICAO ³ | * | | | | | 1 1 1 1 | 0 0 | 0 0 1 | 0 0 1 | 0 0 | ----- |
| <p>1. ICAO administers this block for assigning temporary aircraft addresses as described in section 7.</p> <p>2. Block allocated for special use in the interest of flight safety.</p> | | | | | | | | | | | |

SCHEDULE 13

Regulation 75 and 76

HF DATA LINK PROTOCOL

1. Physical layer RF characteristics

The aircraft and ground stations shall access the physical medium operating in simplex mode.

2. Frequency bands

Note- HFDL installations shall be capable of operating at any single sideband (SSB) carrier (reference) frequency available to the aeronautical mobile (R) service in the band 2.8 to 22 MHz, and in compliance with the relevant provisions of the Radio Regulations.

(1) Channels

Channel utilisation shall be in conformity with the table of carrier (reference) frequencies of Appendix 27 to the ITU Radio Regulations.

(2) Tuning

The equipment shall be capable of operating on integral multiples of 1 kHz.

(3) Sideband

The sideband used for transmission shall be on the higher side of its carrier (reference) frequency.

(4) Modulation

HFDL shall employ M-ary phase shift keying (M-PSK) to modulate the radio frequency carrier at the assigned frequency. The symbol rate shall be 1 800 symbols per second ± 10 parts per million (i.e. 0.018 symbols per second). The value of M and the information data rate shall be as specified in Table 13-2.

(5) M-PSK carrier

The M-PSK carrier expressed mathematically shall be defined as:

$$s(t) = A \sum (p(t-kT) \cos[2\pi f_0 t + \varphi(k)]), \quad k = 0, 1, \dots, N-1$$

where:

| | | |
|----------------|---|---|
| N | = | number of M-PSK symbols in transmitted physical layer protocol data unit (PPDU) |
| s(t) | = | analog waveform or signal at time t |
| A | = | peak amplitude |
| f ₀ | = | SSB carrier (reference) + 1 440 Hz |
| T | = | M-PSK symbol period (1/1 800 s) |
| φ (k) | = | phase of kth M-PSK symbol |
| p(t-kT) | = | pulse shape of kth M-PSK symbol at time t. |

Note.— The number of M-PSK symbols sent, N, defines the length (duration = NT seconds) of the PPDU. These parameters are defined in the Manual on HF Data Link (Doc 9741).

(6) Pulse shape

The pulse shape, p(t), shall determine the spectral distribution of the transmitted signal. The Fourier transform of the pulse shape, P(f), shall be defined by-

$$\begin{aligned} P(f) &= 1, & \text{if } 0 < |f| < (1 - b)/2T \\ P(f) &= \cos \{ \pi(2|f|T - 1 + b)/4b \}, & \text{if } (1 - b)/2T < |f| < (1 + b)/2T \\ P(f) &= 0, & \text{if } |f| > (1 + b)/2T \end{aligned}$$

where the spectral roll-off parameter, b = 0.31, has been chosen so that the -20 dB points of the signal are at SSB carrier (reference) + 290 Hz and SSB carrier (reference) + 2 590 Hz and the peak-to-average power ratio of the waveform is less than 5 dB.

(7) Transmitter stability

The basic frequency stability of the transmitting function shall be better than:

- (a) ±20 Hz for HF DL aircraft station subsystems; and
- (b) ±10 Hz for HF DL ground station subsystems.

(8) Receiver stability

The basic frequency stability of the receiving function shall be such that, with the transmitting function stability specified in subparagraph (7), the overall frequency difference between ground and airborne functions achieved in service does not exceed 70 Hz.

(9) Protection

A 15 dB desired to undesired (D/U) signal ratio shall apply for the protection of co-channel assignments for HF DL as follows—

- (a) data versus data;
- (b) data versus voice; and
- (c) voice versus data.

(10) Class of emission

The class of emission shall be 2K80J2DEN.

3. Assigned frequency

The HF DL assigned frequency shall be 1 400 Hz higher than the SSB carrier (reference) frequency.

Note. 1— By convention, the HF DL assigned frequency is offset from the SSB carrier (reference) frequency by 1 400 Hz.

Note. 2- The HF DL M-PSK carrier of the digital modulation is offset from the SSB carrier (reference) frequency by 1 440 Hz. The digital modulation is fully contained within the same overall channel bandwidth as the voice signal and complies with the provisions of Appendix 27 to the ITU Radio Regulations.

10. Emission limits

For HF DL aircraft and ground station transmitters, the peak envelope power (Pp) of any emission on any discrete frequency shall be less than the peak envelope power (Pp) of the transmitter in accordance with the following (see Figure 13-1)-

- (a) on any frequency between 1.5 kHz and 4.5 kHz lower than the HFDL assigned frequency, and on any frequency between 1.5 kHz and 4.5 kHz higher than the HFDL assigned frequency: at least 30 dB;
- (b) on any frequency between 4.5 kHz and 7.5 kHz lower than the HFDL assigned frequency, and on any frequency between 4.5 kHz and 7.5 kHz higher than the HFDL assigned frequency: at least 38 dB; and
- (c) on any frequency, lower than 7.5 kHz below the HFDL assigned frequency and on any frequency higher than 7.5 kHz above the HFDL assigned frequency—
 - (i) HFDL aircraft station transmitters: 43 dB;
 - (ii) HFDL ground station transmitters up to and including 50 W: $[43 + 10 \log_{10} P_p(W)]$ dB; and
 - (iii) HFDL ground station transmitters more than 50 W: 60 dB.

11. Power

- (1) Ground station installations. The peak envelope power (P_p) supplied to the antenna transmission line shall not exceed a maximum value of 6 kW as provided for in Appendix 27 of the Radio Regulations.
- (2) Aircraft station installations. The peak envelope power supplied to the antenna transmission line shall not exceed 400 W, except as provided for in Appendix 27/62 of the Radio Regulations.

12. Undesired signal rejection

For HFDL aircraft and ground station receivers, undesired input signals shall be attenuated in accordance with the following—

- (a) on any frequency between f_c and $(f_c - 300 \text{ Hz})$, or between $(f_c + 2\,900 \text{ Hz})$ and $(f_c + 3\,300 \text{ Hz})$: at least 35 dB below the peak of the desired signal level; and
- (b) on any frequency below $(f_c - 300 \text{ Hz})$, or above $(f_c + 3\,300 \text{ Hz})$: at least 60 dB below the peak of the desired signal level, where f_c is the carrier (reference) frequency.

13. Receiver response to transients

The receiving function shall recover from an instantaneous increase in RF power at the antenna terminal of 60 dB within 10 milliseconds. The receiving function shall recover from an instantaneous decrease in RF power at the antenna terminal of 60 dB within 25 milliseconds.

Physical Layer Functions

14. Functions

The functions provided by the physical layer shall include—

- (a) transmitter and receiver control;
- (b) transmission of data; and
- (c) reception of data.

15. Transmitter and receiver control

- (1) The HF DL physical layer shall implement the transmitter/receiver switching and frequency tuning as commanded by the link layer.
- (2) The physical layer shall perform transmitter keying on demand from the link layer to transmit a packet.

16. Transmitter to receiver turnaround time

- (1) The transmitted power level shall decay at least by 10 dB within 100 milliseconds after completing a transmission.
- (2) An HF DL station subsystem shall be capable of receiving and demodulating, with nominal performance, an incoming signal within 200 milliseconds of the start of the subsequent receive slot.

17. Receiver to transmitter turnaround time

An HF DL station subsystem shall provide nominal output power within plus or minus 1 dB to the antenna transmission line within 200 milliseconds of the start of the transmit slot.

18. Transmission of data

- (1) Transmission of data shall be accomplished using a time division multiple access (TDMA) technique.

- (2) The HFDL data link ground station subsystems shall maintain TDMA frame and slot synchronisation for the HFDL system.
- (3) To ensure that slot synchronisation is maintained, each HF data link modulator shall begin outputting a pre-key segment at the beginning of a time slot plus or minus 10 milliseconds.

19. TDMA structure

Each TDMA frame shall be 32 seconds and shall be divided into thirteen equal duration slots as follows—

- (a) the first slot of each TDMA frame shall be reserved for use by the HFDL ground station subsystem to broadcast link management data in SPDU packets; and
- (b) the remaining slots shall be designated either as uplink slots, downlink slots reserved for specific HFDL aircraft station subsystems, or as downlink random access slots for use by all HFDL aircraft station subsystems on a contention basis. These TDMA slots shall be assigned on a dynamic basis using a combination of reservation, polling and random access assignments.

20. Broadcast

The HFDL ground station subsystem shall broadcast a squitter protocol data unit (SPDU) every 32 seconds on each of its operating frequencies.

Note.— Details on the TDMA frame and slot structures, pre-key segment, data structures, including the SPDU, are contained in the Manual on HF Data Link (Doc 9741).

21. Reception of data

- (1) Frequency search

Each HFDL aircraft station shall automatically search the assigned frequencies until it detects an operating frequency.

- (2) Reception of PPDUS

The HF data link receiver shall provide the means to detect, synchronize, demodulate and decode PPDU's modulated according to the waveform, subject to the following distortion-

- (a) the 1 440 Hz audio carrier offset by plus or minus 70 Hz;
- (b) discrete and/or diffuse multipath distortion with up to 5 ms multipath spread;
- (c) multipath amplitude fading with up to 2 Hz two-sided RMS Doppler spread and Rayleigh statistics; and
- (d) additive Gaussian and broadband impulsive noise with varying amplitude and random arrival times.

(3) Decoding of PPDU'S

Upon receipt of the preamble segment the receiver shall—

- (a) detect the beginning of a burst of data;
- (b) measure and correct the frequency offset between the transmitter and receiver due to Doppler shift and transmitter/receiver frequency offsets;
- (c) determine the data rate and interleaver settings to use during data demodulation;
- (d) achieve M-PSK symbol synchronisation ; and
- (e) train the equalizer.

(4) Synchronisation

Each HF DL aircraft station subsystem shall synchronize its slot timing to that of its corresponding ground station with respect to the reception time of the last received SPDU.

(5) Specified packet error rate performance

- (a) The number of HF DL media access protocol data units (MPDU's) received with one or more bit errors shall not exceed 5 per cent of the total number of MPDU's received, when using a 1.8 second interleaver and under the signaling- space conditions shown in Table 13-3.

- (b) The number of HF DL MPDUs received with one or more bit errors shall not exceed 5 per cent of the total number of MPDUs received, when using a 1.8 second interleaver under the conditions shown in Table 13-3a.
- (c) Link layer

Note.— Details on link layer functions are contained in the Manual on HF Data Link (Doc 9741).

The link layer shall provide control functions for the physical layer, link management and data service protocols.

22. Control functions

The link layer shall pass commands for frequency tuning, transmitter keying and transmitter/receiver switching to the physical layer.

23. Link management

The link layer shall manage TDMA slot assignments, log-on and log-off procedures, ground station and aircraft station TDMA synchronisation, and other functions necessary, taking into account message priority, for the establishment and maintenance of communications.

24. Data service protocols

- (1) The link layer shall support a reliable link service (RLS) protocol and a direct link service (DLS) protocol.
- (2) The RLS protocol shall be used to exchange acknowledged user data packets between aircraft and ground peer link layers.
- (3) The DLS protocol shall be used to broadcast unsegmented uplink high frequency network protocol data units (HFNPDU) and other HFNPDU not requiring automatic retransmission by the link layer.
- (4) Sub network layer

Note.— Details on sub network layer protocols and services are contained in the Manual on HF Data Link (Doc 9741).

25. Packet data

The HFDL sub network layer in the HFDL aircraft station subsystem and HFDL ground station subsystem shall provide connection-oriented packet data service by establishing sub network connections between sub network service users.

26. Connectivity notification service

The HFDL sub network layer in the HFDL aircraft station subsystem shall provide the additional connectivity notification service by sending connectivity notification event messages to the attached ATN router.

27. Connectivity notification event messages

The connectivity notification service shall send connectivity notification event messages to the attached ATN router through the sub network access function.

28. HFDL subnetwork layer functions

- (1) The HFDL sub network layer in both the HFDL aircraft station subsystem and HFDL ground station subsystem shall include the following three functions—
 - (a) HFDL sub network dependent (HFSND) function;
 - (b) sub network access function; and
 - (c) interworking function.
- (2) The HFSND function shall perform the HFSND protocol between each pair of HFDL aircraft station subsystems and HFDL ground station subsystems by exchanging HFNPDU: it shall perform the HFSND protocol aircraft function in the HFDL aircraft station subsystem and the HFSND protocol ground function in the HFDL ground station subsystem.
- (3) Subnetwork access function
The sub network access function shall perform the ISO 8208 protocol between the HFDL aircraft station subsystem or HFDL ground station subsystem and the attached routers by exchanging ISO 8208 packets. It shall perform the ISO 8208

DCE function in the HF DL aircraft station subsystem and the HF DL ground station subsystem.

(4) Interworking function

The interworking function shall provide the necessary harmonisation functions between the HFSND, the sub network access and the connectivity notification functions.

TABLES

Table 13-1. Transfer delays

| | <i>Direction</i> | <i>Priority</i> | <i>Delay</i> |
|---------------------------------------|------------------|-----------------|--------------|
| <i>Transit delay</i> | To-aircraft | 7 through 14 | 45 s |
| | From-aircraft | 7 through 14 | 60 s |
| <i>Transfer delay (95 percentile)</i> | To-aircraft | 11 through 14 | 90 s |
| | | 7 through 10 | 120 s |
| | From-aircraft | 11 through 14 | 150 s |
| | | 7 through 10 | 250 s |

Table 13-2. Value of M and information data rate

| <i>M</i> | <i>Information data rate (bits per second)</i> |
|----------|--|
| 2 | 300 or 600 |
| 4 | 1 200 |
| 8 | 1 800 |

Note.— When M equals the value 2, the data rate may be 300 or 600 bits per second as determined by the channel coding rate. The value of M may change from one data transmission to another depending on the data rate selected. The channel coding rate is described in the Manual on HF Data Link (Doc 9741).

Table 13-3. HF signal-in-space conditions

| <i>Data rate (bits per second)</i> | <i>Number of channel paths</i> | <i>Multipath spread (milliseconds)</i> | <i>Fading bandwidth (Hz) per CCIR Report 5492</i> | <i>Frequency offset (Hz)</i> | <i>Signal to noise ratio (dB) in a 3 kHz bandwidth</i> | <i>MPDU size (octets)</i> |
|--|--|--|---|--------------------------------------|--|-------------------------------|
| 1 200 | 1 fixed | – | – | 40 | 4 | 256 |
| 1 800 | 2 fading | 2 | 1 | 40 | 16 | 400 |
| 1 200 | 2 fading | 2 | 1 | 40 | 11.5 | 256 |
| 600 | 2 fading | 2 | 1 | 40 | 8 | 128 |
| 300 | 2 fading | 2 | 1 | 40 | 5 | 64 |

Table 13-3a. HF signal-in-space conditions

| <i>Data rate (bits per second)</i> | <i>Number of channel paths</i> | <i>Multipath spread (milliseconds)</i> | <i>Fading</i> | <i>Frequency</i> | <i>Signal to noise</i> | <i>MPDU size (octets)</i> |
|--|--|--|--|------------------------|--|-------------------------------|
| | | | <i>bandwidth (Hz) per CCIR Report 5492</i> | <i>offset (Hz)</i> | <i>ratio (dB) in a 3 kHz bandwidth</i> | |
| 1 200 | 2 fading | 4 | 1 | 40 | 13 | 256 |
| 1 200 | 2 fading | 2 | 2 | 40 | 11.5 | 256 |

FIGURES

Figure 13-1. Required spectrum limits (in terms of peak power) for HF DL aircraft and ground station transmitters

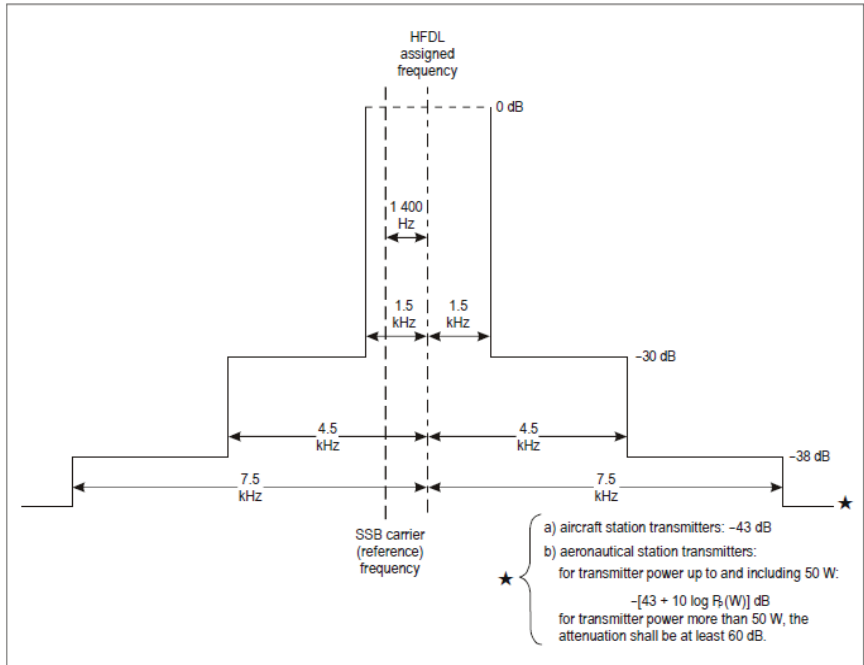


Figure 11-1. Required spectrum limits (in terms of peak power) for HF DL aircraft and ground station transmitters

SCHEDULE 14

Regulation 78

UNIVERSAL ACCESS TRANSCEIVER (UAT)

1. UAT overall system characteristics of aircraft and ground stations

Note.—Details on technical requirements related to the implementation of UAT SARPs are contained in Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861). Part II of the Manual on the Universal Access Transceiver (UAT) (Doc 9861) provides additional guidance material.

- (1) Transmission frequency shall be 978 MHz.
- (2) To ensure frequency stability, the radio frequency of the UAT equipment shall not vary more than ± 0.002 per cent (20 ppm) from the assigned frequency.
- (3) UAT equipment shall operate at one of the power levels shown in Table 14-1*.
- (4) The maximum equivalent isotropically radiated power (EIRP) for a UAT aircraft or ground station shall not exceed +58 dBm.

Note.— For example, the maximum EIRP stated above could result from the maximum allowable aircraft transmitter power shown in Table 14-1 with a maximum antenna gain of 4 dBi.

- (5) Transmit mask: The spectrum of a UAT ADS-B message transmission modulated with pseudorandom message data blocks (MDB) shall fall within the limits specified in Table 14-2 when measured in a 100 kHz bandwidth.

Note.— Figure 14-1* is a graphical representation of Table 14-2.

- (6) Spurious emissions shall be kept at the lowest value which the State of the technique and the nature of the service permit.

Note.— Appendix 3 of the ITU Radio Regulations requires that transmitting stations shall conform to the maximum permitted power levels for spurious emissions or for unwanted emissions in the spurious domain.

- (7) The design polarisation of emissions shall be vertical.
- (8) Time/ amplitude profile of UAT message transmission

The time/amplitude profile of a UAT message transmission shall meet the following requirements, in which the *reference time* is defined as the beginning of the first bit of the synchronisation sequence appearing at the output port of the equipment.

Notes.—

- 1. *All power requirements for subparagraph (9) (a) to (f) apply to the PMP. For installations that support transmitter diversity, the RF power output on the non-selected antenna port should be at least 20 dB below the level on the selected port.*
 - 2. *All power requirements for subparagraph (9) (a) to (f) assume a 300 kHz measurement bandwidth. All power requirements for subparagraph (9) (b), (c) (d) and (e) assume a 2 MHz measurement bandwidth.*
 - 3. *The beginning of a bit is 1/2 bit period prior to the optimum sample point.*
- (9) These requirements are depicted graphically in Figure 14-2.
 - (a) prior to 8 bit periods before the reference time, the RF output power at the PMP shall not exceed -80 dBm;

Note.— This unwanted radiated power restriction is necessary to ensure that the UAT transmitting subsystem does not prevent closely located UAT receiving equipment on the same aircraft from meeting its requirements. It assumes that the isolation between transmitter and receiver equipment at the PMP exceeds 20 dB.

- (b) between 8 and 6 bit periods prior to the reference time, the RF output power at the PMP shall remain at least 20 dB below the minimum power requirement for the UAT equipment class;
- (c) during the Active State, defined as beginning at the reference time and continuing for the duration of the message, the RF output power at the PMP shall be greater than or equal to the minimum power requirement for the UAT equipment class;
- (d) the RF output power at the PMP shall not exceed the maximum power for the UAT equipment class at any time during the Active State;
- (e) within 6 bit periods after the end of the Active State, the RF output power at the PMP shall be at a level at least 20 dB below the minimum power requirement for the UAT equipment class;
- (f) within 8 bit periods after the end of the Active State, the RF output power at the PMP shall fall to a level not exceeding -80 dBm.

Note.— This unwanted radiated power restriction is necessary to ensure that the transmitting subsystem does not prevent closely located UAT receiving equipment on the same aircraft from meeting its requirements. It assumes that the isolation between transmitter and receiver equipment at the PMP exceeds 20 dB.

2. System characteristics of universal access transceiver ground installation

Ground station transmitting function

(a) Ground station transmitter power

The effective radiated power shall be such as to provide a field strength of at least 280 microvolts per metre (minus 97 dBW/m²) within the service volume of the facility on the basis of free-space propagation.

Note.— This is determined on the basis of delivering a -91 dBm

(corresponds to 200 microvolts per metre) signal level at the PMP (assuming an omnidirectional antenna). The 280 $\mu\text{V}/\text{m}$ standard corresponds to the delivery of a -88 dBm signal level at the PMP of the receiving equipment. The 3 dB difference between -88 dBm and -91 dBm provides margin for excess path loss over free-space propagation.

(b) Ground station receiving function

Note.— An example of a ground station receiver is discussed in Section 2.5 of Part II of the Manual on the Universal Access Transceiver (UAT) (Doc 9861), with UAT air-to-ground performance estimates consistent with use of that receiver provided in Appendix B of that manual.

3. System characteristics of the aircraft installation

(1) Aircraft transmitting function

(a) Aircraft transmitter power

The effective radiated power shall be such as to provide a field strength of at least 225 microvolts per metre (minus 99 dBW/m²) on the basis of free-space propagation, at ranges and altitudes appropriate to the operational conditions pertaining to the areas over which the aircraft is operated. Transmitter power shall not exceed 54 dBm at the PMP.

Note 1.— The above field strength is determined on the basis of delivering a -93 dBm (corresponds to 160 microvolts per metre) signal level at the PMP (assuming an omnidirectional antenna). The 3 dB difference between 225 $\mu\text{V}/\text{m}$ and 160 $\mu\text{V}/\text{m}$ provides margin for excess path loss over free-space propagation when receiving a long UAT ADS-B message. A 4 dB margin is provided when receiving a basic UAT ADS-B message.

Note 2.— Various aircraft operations may have different air-air range requirements depending on the intended ADS-B

function of the UAT equipment. Therefore, different installations may operate at different power levels.

(b) Receiving function

Receiver sensitivity

(i) Long UAT ADS-B message as desired signal

A desired signal level of -93 dBm applied at the PMP shall produce a rate of successful message reception (SMR) of 90 per cent or better under the following conditions—

(aa) when the desired signal is of nominal modulation (i.e. FM deviation is 625 kHz) and at the maximum signal frequency offsets, and subject to relative Doppler shift at ± 1 200 knots;

(bb) when the desired signal is of maximum modulation distortion allowed in paragraph 4(3) at the nominal transmission frequency ± 1 parts per million (ppm), and subject to relative Doppler shift at ± 1 200 knots.

Note. — The receiver criteria for successful message reception of UAT ADS-B messages are provided in Section 4 of Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861).

(ii) Basic UAT ADS-B message as desired signal

A desired signal level of -94 dBm applied at the PMP shall produce a rate of SMR of 90 per cent or better under the following conditions—

(aa) When the desired signal is of nominal modulation (i.e. FM deviation is 625 kHz) and at the maximum signal frequency offsets, and subject to relative Doppler shift at ± 1 200 knots;

- (bb) When the desired signal is of maximum modulation distortion allowed in this Schedule, at the nominal transmission frequency ± 1 ppm, and subject to relative Doppler shift at ± 1 200 knots.

Note.— The receiver criteria for successful message reception of UAT ADS-B messages are provided in Section 4 of Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861).

- (iii) UAT ground uplink message as desired signal

A desired signal level of -91 dBm applied at the PMP shall produce a rate of an SMR of 90 per cent or better under the following conditions—

- (aa) when the desired signal is of nominal modulation (i.e. FM deviation is 625 kHz) and at the maximum signal frequency offsets, and subject to relative Doppler shift at ± 850 knots;
- (bb) when the desired signal is of maximum modulation distortion allowed in paragraph 4(3), at the nominal transmission frequency ± 1 ppm, and subject to relative Doppler shift at ± 850 knots.

Notes.—

1. *The receiver criteria for successful message reception of UAT ground uplink messages are provided in Section 4 of Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861) (in preparation).*
2. *This requirement ensures the bit rate accuracy supporting demodulation in the UAT equipment is adequate to properly receive the longer UAT ground uplink message.*

- (iv) Receiver selectivity
- Notes.—*
1. *The undesired signal used is an unmodulated carrier applied at the frequency offset.*
 2. *This requirement establishes the receiver's rejection of the off-channel energy.*
 3. *It is assumed that ratios in between the specified offsets will fall near the interpolated value.*
 4. *The desired signal used is a UAT ADS-B long message at -90 dBm at the PMP, to be received with a 90 per cent successful message reception rate.*
 5. *The tolerable co-channel continuous wave interference power level for aircraft UAT receivers is assumed to be -101 dBm or less at the PMP.*
 6. *See Section 2.4.2 of Part II of the Manual on the Universal Access Transceiver (UAT) (Doc 9861) for a discussion of when a high-performance receiver is desirable.*
 7. *Standard UAT receivers shall meet the selectivity characteristics given in Table 14-3.*
 8. *High-performance receivers shall meet the more stringent selectivity characteristics given in Table 14-4.*

Note.— See Section 2.4.2 of Part II of the Manual on the Universal Access Transceiver (UAT) (Doc 9861) for guidance material on the implementation of high-performance receivers.

- (v) Receiver desired signal dynamic range
- The receiver shall achieve a successful message reception rate for long ADS-B messages of 99 percent or better when the desired signal level is between -90 dBm and -10 dBm at the PMP in the absence of any interfering signals.

Note.— The value of -10 dBm represents 120-foot separation from an aircraft transmitter transmitting at maximum allowed power.

- (vi) Receiver tolerance to pulsed interference

Note.— All power level requirements in this Schedule are referenced to the PMP.

For Standard and High-Performance receivers the following requirements shall apply—

- (aa) the receiver shall be capable of achieving 99 per cent SMR of long UAT ADS-B messages when the desired signal level is between -90 dBm and -10 dBm when subjected to DME interference under the following conditions: DME pulse pairs at a nominal rate of 3 600 pulse pairs per second at either 12 or 30 microseconds pulse spacing at a level of -36 dBm for any 1 MHz DME channel frequency between 980 MHz and 1 213 MHz inclusive;
 - (bb) following a 21 microsecond pulse at a level of ZERO (0) dBm and at a frequency of 1 090 MHz, the receiver shall return to within 3 dB of the specified sensitivity level within 12 microseconds.
- (viii) For the standard UAT receiver the following additional requirements shall apply—
- (a) the receiver shall be capable of achieving 90 per cent SMR of long UAT ADS-B messages when the desired signal level is between -87 dBm and -10 dBm when subjected to DME interference under the following conditions: DME pulse pairs at a nominal rate of 3 600

pulse pairs per second at a 12 microseconds pulse spacing at a level of -56 dBm and a frequency of 979 MHz;

(b) the receiver shall be capable of achieving 90 per cent SMR of long UAT ADS-B messages when the desired signal level is between -87 dBm and -10 dBm when subjected to DME interference under the following conditions: DME pulse pairs at a nominal rate of 3 600 pulse pairs per second at a 12 microseconds pulse spacing at a level of -70 dBm and a frequency of 978 MHz.

(ix) For the high-performance receiver the following additional requirements shall apply—

(aa) the receiver shall be capable of achieving 90 per cent SMR of long UAT ADS-B messages when the desired signal level is between -87 dBm and -10 dBm when subjected to DME interference under the following conditions: DME pulse pairs at a nominal rate of 3 600 pulse pairs per second at a 12 microseconds pulse spacing at a level of -43 dBm and a frequency of 979 MHz;

(bb) the receiver shall be capable of achieving 90 per cent SMR of long UAT ADS-B messages when the desired signal level is between -87 dBm and -10 dBm when subjected to DME interference under the following conditions: DME pulse pairs at a nominal rate of 3 600 pulse pairs per second at a 12 microseconds pulse spacing at a level of -79 dBm and a frequency of 978 MHz.

4. Physical layer characteristics

(1) Modulation rate

The modulation rate shall be 1.041 667 Mbps with a tolerance for aircraft transmitters of ± 20 ppm and a tolerance for ground transmitters of ± 2 ppm.

Note.— The tolerance on the modulation rate is consistent with the requirement on modulation distortion.

(2) Modulation type—

- (a) data shall be modulated onto the carrier using binary continuous phase frequency shift keying. The modulation index, h , shall be no less than 0.6;
- (b) a binary ONE (1) shall be indicated by a shift up in frequency from the nominal carrier frequency and a binary ZERO (0) by a shift down from the nominal carrier frequency.

Notes.—

- 1. *Filtering of the transmitted signal (at base band and/or after frequency modulation) will be required to meet the spectral containment requirement of paragraph 1(5). This filtering may cause the deviation to exceed these values at points other than the optimum sampling points.*

Because of the filtering of the transmitted signal, the received frequency offset varies continuously between the nominal values of ± 312.5 kHz (and beyond), and the optimal sampling point may not be easily identified. This point can be defined in terms of the so-called “eye diagram” of the received signal. The ideal eye diagram is a superposition of samples of the (undistorted) post detection waveform shifted by multiples of the bit period (0.96 microseconds). The optimum sampling point is the point during the bit period at which the opening of the eye diagram (i.e. the minimum separation between positive and negative frequency offsets at very high signal-to-

noise ratios) is maximised. An example “eye diagram” can be seen in Figure 14-3. The timing of the points where the lines converge defines the “optimum sampling point”. Figure 14-4 shows an eye pattern that has been partially closed by modulation distortion.

(3) Modulation distortion

- (a) For aircraft transmitters, the minimum vertical opening of the eye diagram of the transmitted signal (measured at the optimum sampling points) shall be no less than 560 kHz when measured over an entire long UAT ADS-B message containing pseudorandom message data blocks.
- (b) For ground transmitters, the minimum vertical opening of the eye diagram of the transmitted signal (measured at the optimum sampling points) shall be no less than 560 kHz when measured over an entire UAT ground uplink message containing pseudorandom message data blocks.
- (c) For aircraft transmitters, the minimum horizontal opening of the eye diagram of the transmitted signal (measured at 978 MHz) shall be no less than 0.624 microseconds (0.65 symbol periods) when measured over an entire long UAT ADS-B message containing pseudorandom message data blocks.
- (d) For ground transmitters, the minimum horizontal opening of the eye diagram of the transmitted signal (measured at 978 MHz) shall be no less than 0.624 microseconds (0.65 symbol periods) when measured over an entire UAT ground uplink message containing pseudorandom message data blocks.

Notes.-The ideal eye diagram is a superposition of samples of the (undistorted) post detection waveform shifted by multiples of the bit period (0.96 microseconds).

(4) Broadcast message characteristics

The UAT system shall support two different message types: the UAT ADS-B message and the UAT ground uplink message.

- (5) UAT ADS-B message
The Active portion of a UAT ADS-B message shall contain the following elements, in the following order—
- (a) Bit synchronisation ;
 - (b) Message data block; and
 - (c) FEC parity.

- (6) BIT synchronisation
The first element of the Active portion of the UAT ADS-B message shall be a 36-bit synchronisation sequence. For the UAT ADS-B messages the sequence shall be—

111010101100110111011010010011100010

with the left-most bit transmitted first.

- (7) Message data block
The second element of the active portion of the UAT ADS-B message shall be the message data block. There shall be two lengths of UAT ADS-B message data blocks supported. The basic UAT ADS-B message shall have a 144-bit message data block and the long UAT ADS-B message shall have a 272-bit message data block.

Note.— The format, encoding and transmission order of the message data block element is provided in Section 2.1 of Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861)

- (8) FEC parity
The third and final element of the Active portion of the UAT ADS-B message shall be the FEC parity.
- (9) Code type
The FEC parity generation shall be based on a systematic Reed-Solomon (RS) 256-ary code with 8-bit code word symbols.

FEC parity generation shall be per the following code—

- (a) basic UAT ADS-B message: Parity shall be a RS (30, 18) code.

Note.— This results in 12 bytes (code symbols) of parity capable of correcting up to 6 symbol errors per block.

- (b) long UAT ADS-B message: Parity shall be a RS (48, 34) code.
- (c) For either message length the primitive polynomial of the code shall be as follows—

$$p(x) = x^8 + x^7 + x^2 + x + 1$$

- (d) The generator polynomial shall be as follows-

$$\prod_{i=1}^P (x - \alpha^i)$$

where:

P = 131 for RS (30, 18) code,

P = 133 for RS (48, 34) code, and

α is a primitive element of a Galois field of size 256 (i.e. GF(256)).

- (b) Transmission order of FEC parity

FEC parity bytes shall be ordered most significant to least significant in terms of the polynomial coefficients they represent. The ordering of bits within each byte shall be most significant to least significant. FEC parity bytes shall follow the message data block.

5. UAT ground uplink message

- (1) The active portion of a UAT ground uplink message shall contain the following elements, in that order—

- (a) Bit synchronisation ; and

- (b) Interleaved message data block and FEC parity.
- (2) Bit synchronisation
The first element of the active portion of the UAT ground uplink message shall be a 36-bit synchronisation sequence of—
000101010011001000100101101100011101
with the left-most bit transmitted first.
- (3) Interleaved message data block and FEC parity
 - (a) message data block (before interleaving and after de-interleaving)
The UAT ground uplink message shall have 3 456 bits of message data block, with bits divided into 6 groups of 576 bits and FEC shall be applied to each group as described in subparagraph (b).

Note.—Further details on the format, encoding and transmission order of the UAT ground uplink message data block is provided in Section 2.2 of Part I of the Manual on the Universal Access Transceiver (UAT) (Doc 9861).

- (b) FEC parity (before interleaving and after de-interleaving)
 - (i) Code type
The FEC parity generation shall be based on a systematic RS 256-ary code with 8-bit code word symbols. FEC parity generation for each of the six blocks shall be a RS (92,72) code.

Notes.—

1. *Paragraph 5(3) provides details on the interleaving procedure.*
 2. *This results in 20 bytes (symbols) of parity capable of correcting up to 10 symbol errors per block. The additional use of interleaving for the UAT ground uplink message allows additional robustness against burst errors.*
- (ii) The primitive polynomial of the code is as

follows—

$$p(x) = x^8 + x^7 + x^2 + x + 1$$

- (iii) The generator polynomial is as follows—

$$\prod_{i=1}^P (x - \alpha^i)$$

where:

$P = 139$, and

α is a primitive element of a Galois field of size 256 (i.e. GF(256)).

- (iv) Transmission order of FEC parity
FEC parity bytes are ordered most significant to least significant in terms of the polynomial coefficients they represent. The ordering of bits within each byte shall be most significant to least significant. FEC parity bytes shall follow the message data block.

- (c) Interleaving procedure

UAT ground uplink messages shall be interleaved and transmitted by the ground station, as listed below—

- (i) interleaving procedure: The interleaved message data block and FEC parity consists of 6 interleaved Reed- Solomon blocks. The interleaver shall be represented by a 6×92 matrix, where each entry is a RS 8-bit symbol. Each row comprises a single RS (92,72) block as shown in Table 14-5. In this table, block numbers prior to interleaving are represented as “A” through “F”. The information is ordered for transmission column by column, starting at the upper left corner of the matrix.
- (ii) Transmission order: The bytes are then transmitted in the following order- 1,73,145,217,289,361,2,74

,146,218,290,362,3, C/20, D/20, E/20, F/20

Notes.—1. On reception, these bytes need to be de-interleaved so that the RS blocks can be reassembled prior to error correction decoding.

2. *The Manual on the Universal Access Transceiver (UAT) (Doc 9861), Part I, provides detailed technical specifications on UAT, including ADS-B message data blocks and formats, procedures for operation of UAT transmitting subsystems, and avionics interface requirements with other aircraft systems.*
3. *The Manual on the Universal Access Transceiver (UAT) (Doc 9861), Part II, provides information on UAT system operation, description of a range of example avionics equipment classes and their applications, guidance on UAT aircraft and ground station installation aspects, and detailed information on UAT system performance simulation.*

TABLES

Table 14-1. Transmitter power levels

| <i>Transmitter type</i> | <i>Minimum power at PMP</i> | <i>Maximum power at PMP</i> | <i>Intended minimum air-to-air ranges</i> |
|-------------------------|--|-----------------------------|---|
| Aircraft (Low) | 7 watts (+38.5 dBm) | 18 watts (+42.5 dBm) | 20 NM |
| Aircraft (Medium) | 16 watts (+42 dBm) | 40 watts (+46 dBm) | 40 NM |
| Aircraft (High) | 100 watts (+50 dBm) | 250 watts (+54 dBm) | 120 NM |
| Ground Station | Specified by the service provider to meet local requirements | | |

Notes.—

1. *The three levels listed for the avionics are available to support applications with varying range requirements. See the discussion*

of UAT aircraft Equipage Classes in Section 2.4.2 of Part II of the Manual on the Universal Access Transceiver (UAT) (Doc 9861).

2. The intended minimum air-to-air ranges are for high-density air traffic environments. Larger air-to-air ranges will be achieved in low-density air traffic environments.

Table 14-2. UAT transmit spectrum

| <i>Frequency offset from centre</i> | <i>Required attenuation from maximum power level (dB as measured at the PMP)</i> |
|--|--|
| All frequencies in the range 0 – 0.5 MHz | 0 |
| All frequencies in the range 0.5 – 1.0 MHz | Based on linear* interpolation between these points |
| 1.0 MHz | 18 |
| All frequencies in the range 1.0 – 2.25 MHz | Based on linear* interpolation between these points |
| 2.25 MHz | 50 |
| All frequencies in the range 2.25 – 3.25 MHz | Based on linear* interpolation between these points |
| 3.25 MHz | 60 |

* based on attenuation in dB and a linear frequency scale

Note.— It is assumed that ratios in between the specified offsets will fall near the interpolated value.

Table 14-3. Standard UAT receiver rejection ratios

| <i>Frequency offset from centre</i> | <i>Minimum rejection ratio (Undesired/desired level in dB)</i> |
|-------------------------------------|--|
| -1.0 MHz | 10 |
| +1.0 MHz | 15 |
| (±) 2.0 MHz | 50 |
| (±) 10.0 MHz | 60 |

Note.— It is assumed that ratios in between the specified offsets will fall near the interpolated value.

Table 14-4. High-performance receiver rejection ratios

| <i>Frequency offset from centre</i> | <i>Minimum rejection ratio (Undesired/desired level in dB)</i> |
|---|--|
| -1.0 MHz | 30 |
| +1.0 MHz | 40 |
| (±) 2.0 MHz | 50 |
| (±) 10.0 MHz | 60 |

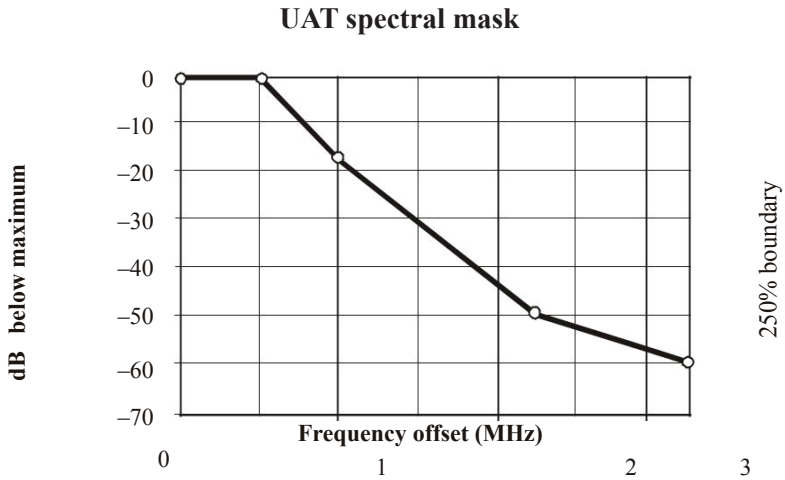
Table 14-5. Ground uplink interleaver matrix

| <i>RS Block</i> | <i>MDB Byte #</i> | | | | | | <i>FEC Parity (Block/Byte #)</i> | | | |
|---------------------|-------------------|-----|-----|-----|-----|-----|----------------------------------|-----|------|------|
| | A | 1 | 2 | 3 | ... | 71 | 72 | A/1 | ... | A/19 |
| B | 73 | 74 | 75 | ... | 143 | 144 | B/1 | ... | B/19 | B/20 |
| C | 145 | 146 | 147 | ... | 215 | 216 | C/1 | ... | C/19 | C/20 |
| D | 217 | 218 | 219 | ... | 287 | 288 | D/1 | ... | D/19 | D/20 |
| E | 289 | 290 | 291 | ... | 359 | 360 | E/1 | ... | E/19 | E/20 |
| F | 361 | 362 | 363 | ... | 431 | 432 | F/1 | ... | F/19 | F/20 |

Note.— In Table 14-5, message data block Byte #1 through #72 are the 72 bytes (8 bits each) of message data block information carried in the first RS (92, 72) block. FEC parity A/1 through A/20 are the 20 bytes of FEC parity associated with that block (A).

FIGURES

Figure 14-1. UAT transmit spectrum



Notes.—

1. 99 per cent of the power of the UAT spectrum is contained in 1.3 MHz (± 0.65 MHz). This is roughly equivalent to the 20 dB bandwidth.
2. Spurious emissions requirements begin at ± 250 per cent of the 1.3 MHz value, therefore the transmit mask requirement extends to ± 3.25 MHz.

Figure 14-2 Time/ amplitude profile of UAT message transmission

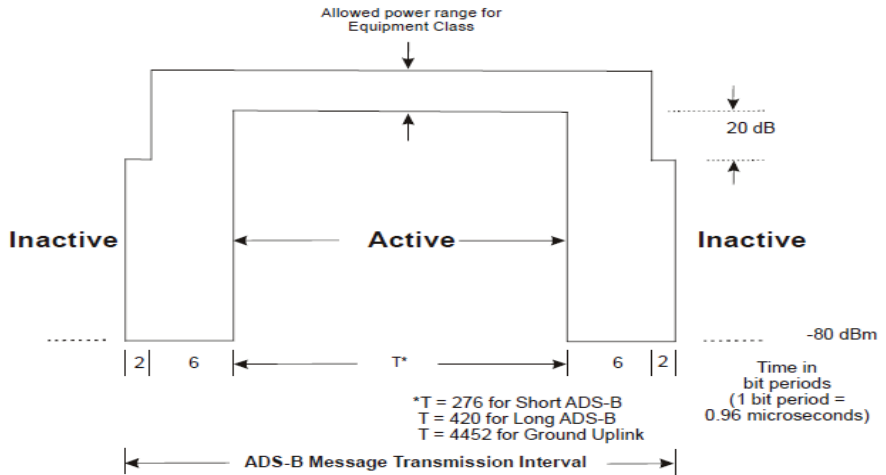


Figure 12-2. Time/amplitude profile of UAT message transmission

Figure 14-4 Ideal eye diagram

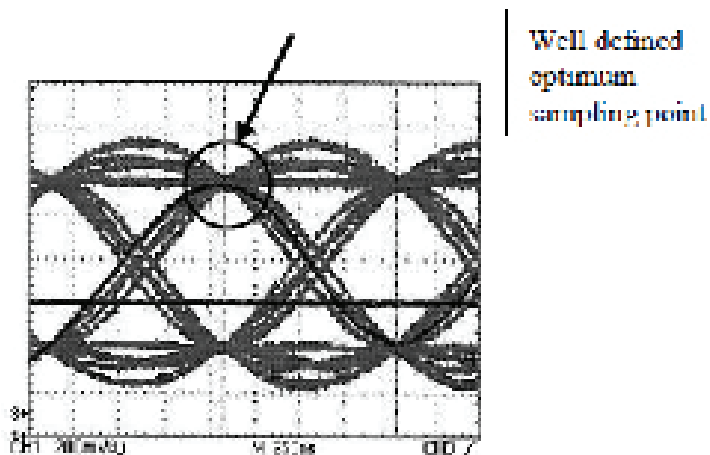


Figure 12-3. Ideal eye diagram

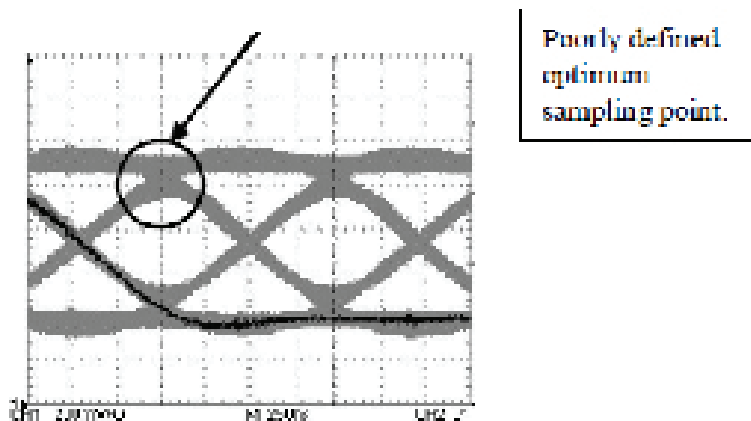
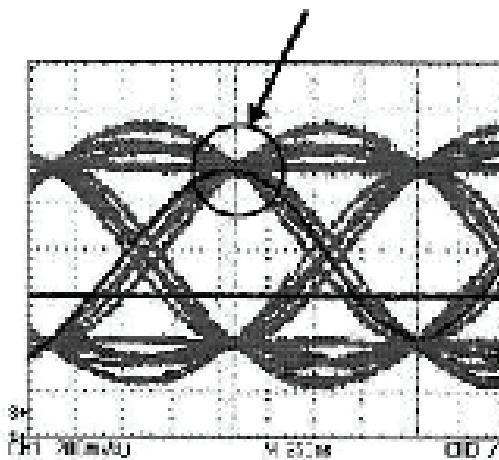


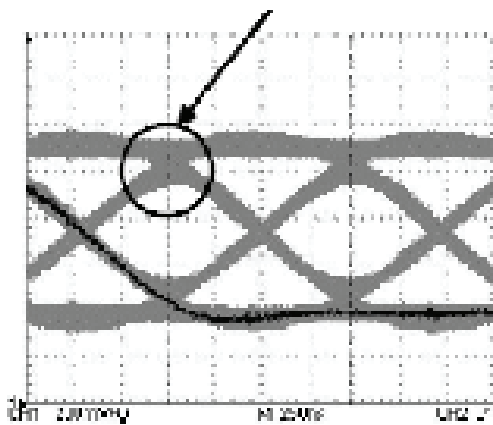
Figure 12 4. Distorted eye diagram

Figure 14-4 Distorted eye diagram



Well defined
optimum
sampling point

Figure 12-3. Ideal eye diagram



Poorly defined
optimum
sampling point.

Figure 12-4. Distorted eye diagram

SCHEDULE 15

AERONAUTICAL MOBILE SERVICE

Regulations 80 and 81

1. Air-Ground VHF Communication System Characteristics

Note.— *In this Schedule, the channel spacing for 8.33 kHz channel assignments is defined as 25 kHz divided by 3 which is 8.3333 ... kHz.*

The characteristics of the air-ground VHF communication system used in the International Aeronautical Mobile Service shall be in conformity with the following—

- (a) radiotelephone emissions shall be double sideband (DSB) amplitude modulated (AM) carriers. The designation of emission is A3E, as specified in the ITU Radio Regulations;
- (b) spurious emissions shall be kept at the lowest value which the State of technique and the nature of the service permit.

Note.— *Appendix S3 to the ITU Radio Regulations specifies the levels of spurious emissions to which transmitters must conform.*

- (c) the radio frequencies used shall be selected from the radio frequencies in the band 117.975-137 MHz. The separation between assignable frequencies (channel spacing) and frequency tolerances applicable to elements of the system shall be as specified in Civil Aviation (Aeronautical Frequency Management) Regulations, 2019.

Note.— *The band 117.975 – 132 MHz was allocated to the Aeronautical Mobile (R) Service in the ITU Radio Regulations (1947). By subsequent revisions at ITU World Administrative Radio Conferences the bands 132 – 136 MHz and 136 – 137 MHz were added under conditions which differ for ITU Regions, or*

for specified countries or combinations of countries (see RRs S5.203, S5.203A and S5.203B for additional allocations in the band 136 – 137 MHz, and S5.201 for the band 132 – 136 MHz).

(d) the design polarisation of emissions shall be vertical.

2. System characteristics of the ground installation

(1) Transmitting function

(a) *Frequency stability.* The radio frequency of operation shall not vary more than plus or minus 0.005 per cent from the assigned frequency. Where 25 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.002 per cent from the assigned frequency. Where 8.33 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.0001 per cent from the assigned frequency.

Note.— The above frequency stability requirements will not be sufficient for offset carrier systems using 25 kHz channel spacing or higher.

(b) Offset carrier systems in 8.33 kHz, 25 kHz, 50 kHz and 100 kHz channel spaced environments. The stability of individual carriers of an offset carrier system shall be such as to prevent first-order heterodyne frequencies of less than 4 kHz and, additionally, the maximum frequency excursion of the outer carrier frequencies from the assigned carrier frequency shall not exceed 8 kHz. Offset carrier systems for 8.33 kHz channel spacing shall be limited to two-carrier systems using a carrier offset of plus and minus 2.5 kHz.

(c) Power

On a high percentage of occasions, the effective radiated power shall be such as to provide a field strength of a least 75 microvolts per metre (minus 109 dBW/m²) within the

defined operational coverage of the facility, on the basis of free-space propagation.

- (d) *Modulation.* A peak modulation factor of at least 0.85 shall be achievable.
- (e) Means shall be provided to maintain the average modulation factor at the highest practicable value without over-modulation.

3. Receiving function

- (1) Frequency stability. Where 8.33 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.0001 per cent from the assigned frequency.
- (2) Sensitivity. After due allowance has been made for feeder loss and antenna polar diagram variation, the sensitivity of the receiving function shall be such as to provide on a high percentage of occasions an audio output signal with a wanted/unwanted ratio of 15 dB, with a 50 per cent amplitude modulated (A3E) radio signal having a field strength of 20 microvolts per metre (minus 120 dBW/m²) or more.
- (3) Effective acceptance bandwidth. When tuned to a channel having a width of 25 kHz, 50 kHz or 100 kHz, the receiving system shall provide an adequate and intelligible audio output when the signal specified at subparagraph (2) has a carrier frequency within plus or minus 0.005 per cent of the assigned frequency. When tuned to a channel having a width of 8.33 kHz, the receiving system shall provide an adequate and intelligible audio output when the signal specified at subparagraph (2) has a carrier frequency within plus or minus 0.0005 per cent of the assigned frequency.

Note.— *The effective acceptance bandwidth includes Doppler shift.*

- (4) Adjacent channel rejection. The receiving system shall ensure an effective rejection of 60 dB or more at the next assignable channel.

Note.— The next assignable frequency will normally be plus or minus 50 kHz. Where this channel spacing will not suffice, the next assignable frequency will be plus or minus 25 kHz, or plus or minus 8.33 kHz, implemented in accordance with the provisions of Volume V. It is recognised that in certain areas of the world receivers designed for 25 kHz, 50 kHz or 100 kHz channel spacing may continue to be used.

4. System characteristics of the airborne installation

(1) Transmitting function

- (a) Frequency stability. The radio frequency of operation shall not vary more than plus or minus 0.005 per cent from the assigned frequency. Where 25 kHz channel spacing is introduced, the radio frequency of operation shall not vary more than plus or minus 0.003 per cent from the assigned frequency. Where 8.33 kHz channel spacing is introduced, the radio frequency of operation shall not vary more than plus or minus 0.0005 per cent from the assigned frequency.
- (b) Power. On a high percentage of occasions, the effective radiated power shall be such as to provide a field strength of at least 20 microvolts per metre (minus 120 dBW/m²) on the basis of free space propagation, at ranges and altitudes appropriate to the operational conditions pertaining to the areas over which the aircraft is operated.
- (c) Adjacent channel power. The amount of power from a 8.33 kHz airborne transmitter under all operating conditions when measured over a 7 kHz channel bandwidth centred on the first 8.33 kHz adjacent channel shall not exceed -45 dB below the transmitter carrier power. The above adjacent channel power shall take into account the typical voice spectrum

Note.— The voice spectrum is assumed to be a constant level between 300 and 800 Hz and attenuated by 10 dB per octave above 800 Hz.

- (d) Modulation. A peak modulation factor of at least 0.85 shall be achievable.
 - (e) Means shall be provided to maintain the average modulation factor at the highest practicable value without over-modulation.
- (2) Receiving function
Frequency stability. Where 8.33 kHz channel spacing is introduced in accordance with Volume V, the radio frequency of operation shall not vary more than plus or minus 0.0005 per cent from the assigned frequency.
- (3) Sensitivity
- (a) After due allowance has been made for aircraft feeder mismatch, attenuation loss and antenna polar diagram variation, the sensitivity of the receiving function shall be such as to provide on a high percentage of occasions an audio output signal with a wanted/unwanted ratio of 15 dB, with a 50 per cent amplitude modulated (A3E) radio signal having a field strength of 75 microvolts per metre (minus 109 dBW/m²).

Note.— For planning extended range VHF facilities, an airborne receiving function sensitivity of 30 microvolts per metre may be assumed.

- (b) Effective acceptance bandwidth for 100 kHz, 50 kHz and 25 kHz channel spacing receiving installations. When tuned to a channel designated in Volume V as having a width of 25 kHz, 50 kHz or 100 kHz, the receiving function shall ensure an effective acceptance bandwidth as follows—
 - (i) in areas where offset carrier systems are employed, the receiving function shall provide an adequate audio output when the signal specified in subparagraph (2)(1)(b) has a carrier frequency within 8 kHz of the assigned frequency;

- (ii) in areas where offset carrier systems are not employed, the receiving function shall provide an adequate audio output when the signal specified in subparagraph (2)(1)(b) has a carrier frequency of plus or minus 0.005 per cent of the assigned frequency.
- (c) Effective acceptance bandwidth for 8.33 kHz channel spacing receiving installations. When tuned to a channel designated in Volume V, as having a width of 8.33 kHz, the receiving function shall ensure an effective acceptance bandwidth as follows—
 - (i) in areas where offset carrier systems are employed, the receiving function shall provide an adequate audio output when the signal specified in subparagraph (a) has a carrier frequency of plus or minus 2.5 kHz of the assigned frequency; and
 - (ii) in areas where offset carrier systems are not employed, the receiving function shall provide an adequate audio output when the signal specified in subparagraph(a) has a carrier frequency within plus or minus 0.0005 per cent of the assigned frequency.

Note 1.— The effective acceptance bandwidth includes Doppler shift.

Note 2.— When using offset carrier systems, receiver performance may become degraded when receiving two or more similar strength offset carrier signals. Caution is therefore advised with the implementation of offset carrier systems.

- (d) Adjacent channel rejection. The receiving function shall ensure an effective adjacent channel rejection as follows—
 - (i) 8.33 kHz channels: 60 dB or more at plus or minus 8.33 kHz with respect to the assigned frequency, and 40 dB or more at plus or minus 6.5 kHz;

Note.— *The receiver local oscillator phase noise should be sufficiently low to avoid any degradation of the receiver capability to reject off carrier signals. A phase noise level better than minus 99 dBc/Hz 8.33 kHz away from the carrier is necessary to comply with 45 dB adjacent channel rejection under all operating conditions.*

- (ii) 25 kHz channel spacing environment: 50 dB or more at plus or minus 25 kHz with respect to the assigned frequency and 40 dB or more at plus or minus 17 kHz;
 - (iii) 50 kHz channel spacing environment: 50 dB or more at plus or minus 50 kHz with respect to the assigned frequency and 40 dB or more at plus or minus 35 kHz;
 - (iv) 100 kHz channel spacing environment: 50 dB or more at plus or minus 100 kHz with respect to the assigned frequency.
- (e) Whenever practicable, the receiving system shall ensure an effective adjacent channel rejection characteristic of 60 dB or more at plus or minus 25 kHz, 50 kHz and 100 kHz from the assigned frequency for receiving systems intended to operate in channel spacing environments of 25 kHz, 50 kHz and 100 kHz, respectively.

Note.— *Frequency planning is normally based on an assumption of 60 dB effective adjacent channel rejection at plus or minus 25 kHz, 50 kHz or 100 kHz from the assigned frequency as appropriate to the channel spacing environment.*

- (f) *In the case of receivers complying with paragraph (a) or (d) used in areas where offset carrier systems are in force, the characteristics of the receiver shall be such that—*
- (i) the audio frequency response precludes harmful levels of audio heterodynes resulting from the reception of two or more offset carrier frequencies;

- (ii) the receiver muting circuits, if provided, operate satisfactorily in the presence of audio heterodynes resulting from the reception of two or more offset carrier frequencies.

5. VDL — interference immunity performance

- (1) For equipment intended to be used in independent operations of services applying DSB-AM and VDL technology on board the same aircraft, the receiving function shall provide an adequate and intelligible audio output with a desired signal field strength of not more than 150 microvolts per metre (minus 102 dBW/m²) and with an undesired VDL signal field strength of at least 50 dB above the desired field strength on any assignable channel 100 kHz or more away from the assigned channel of the desired signal.

Note.— This level of VDL interference immunity performance provides a receiver performance consistent with the influence of the VDL RF spectrum mask as specified in the paragraph 6 of Schedule 5 with an effective transmitter/receiver isolation of 68 dB. Better transmitter and receiver performance could result in less isolation required.

- (2) After 1 January 2002, the receiving function of all new installations intended to be used in independent operations of services applying DSB-AM and VDL technology on board the same aircraft shall meet the provisions of subparagraph (1).
- (3) After 1 January 2005, the receiving function of all installations intended to be used in independent operations of services applying DSB-AM and VDL technology on board the same aircraft shall meet the provisions of subparagraph (1), subject to the conditions of subparagraph (4).
- (4) Requirements for mandatory compliance of the provisions of paragraph (3) shall be made on the basis of regional air navigation agreements which specify the airspace of operation and the implementation timescales.

- (5) The agreement indicated in paragraph (4) shall provide at least two years' notice of mandatory compliance of airborne systems.

6. Interference immunity performance

- (1) The VHF communications receiving system shall provide satisfactory performance in the presence of two signal, third-order intermodulation products caused by VHF FM broadcast signals having levels at the receiver input of minus 5 dBm.
- (2) The VHF communications receiving system shall not be desensitised in the presence of VHF FM broadcast signals having levels at the receiver input of minus 5 dBm.
- (3) All new installations of airborne VHF communications receiving systems shall meet the provisions of paragraph (1) and (2).
- (4) Airborne VHF communications receiving systems meeting the immunity performance standards of these Regulations shall be placed into operation at the earliest possible date.

7. Single sideband (SSB) HF communication system characteristics for use in the aeronautical mobile service

The characteristics of the air-ground HF SSB system, where used in the Aeronautical Mobile Service, shall be in conformity with the following specifications—

- (1) Frequency range
 - (a) HF SSB installations shall be capable of operation at any SSB carrier (reference) frequency available to the Aeronautical Mobile (R) Service in the band 2.8 MHz to 22 MHz and necessary to meet the approved assignment plan for the region(s) in which the system is intended to operate, and in compliance with the relevant provisions of the Radio Regulations.
 - (b) The equipment shall be capable of operating on integral multiples of 1 kHz.

- (2) Sideband selection
The sideband transmitted shall be that on the higher frequency side of its carrier (reference) frequency.
- (3) Carrier (reference) frequency
Channel utilisation shall be in conformity with the table of carrier (reference) frequencies at 27/16 and the Allotment Plan at 27/186 to 27/207 inclusive (or frequencies established on the basis of 27/21, as may be appropriate) of Appendix S27.

8. Classes of emission and carrier suppression

- (1) The system shall utilise the suppressed carrier class of emission J3E (also J7B and J9B as applicable). When SELCAL is employed as specified in Schedule 16, the installation shall utilise class H2B emission.
- (2) All aeronautical stations and aircraft stations shall introduce the appropriate classes of emission prescribed in subparagraph (1) and the use of class A3E emission shall be discontinued except as provided in subparagraph (4)
- (3) For stations directly involved in coordinated search and rescue operations using the frequencies 3 023 kHz and 5 680 kHz, the class of emission J3E shall be used; however, since maritime mobile and land mobile services shall be involved, A3E and H3E classes of emission shall be used.
- (4) No new DSB equipment shall be installed.
- (5) Aircraft station transmitters shall be capable of at least 26 dB carrier suppression with respect to peak envelope power (Pp) for classes of emission J3E, J7B or J9B.
- (6) Aeronautical station transmitters shall be capable of 40 dB carrier suppression with respect to peak envelope power (Pp) for classes of emission J3E, J7B or J9B.

9. Audio frequency bandwidth

- (1) For radiotelephone emissions the audio frequencies shall be limited to between 300 and 2 700 Hz and the occupied bandwidth of other authorised emissions shall not exceed

the upper limit of J3E emissions. In specifying these limits, however, no restriction in their extension shall be implied in so far as emissions other than J3E are concerned, provided that the limits of unwanted emissions are met.

Note.— For aircraft and aeronautical station transmitter types first installed before 1 February 1983 the audio frequencies will be limited to 3 000 Hz.

- (2) For other authorised classes of emission, the modulation frequencies shall be such that the required spectrum limits of paragraph 11 will be met.

10. Frequency tolerance

- (1) The basic frequency stability of the transmitting function for classes of emission J3E, J7B or J9B shall be such that the difference between the actual carrier of the transmission and the carrier (reference) frequency shall not exceed—
 - (a) 20 Hz for airborne installations;
 - (b) 10 Hz for ground installations.
- (2) The basic frequency stability of the receiving function shall be such that, with the transmitting function stabilities specified in subparagraph (1), the overall frequency difference between ground and airborne functions achieved in service and including Doppler shift, does not exceed 45 Hz. However, a greater frequency difference shall be permitted in the case of supersonic aircraft.

11. Spectrum limits

- (1) For aircraft station transmitter types and for aeronautical station transmitters first installed before 1 February 1983 and using single sideband classes of emission H2B, H3E, J3E, J7B or J9B the mean power of any emission on any discrete frequency shall be less than the mean power (P_m) of the transmitter in accordance with the following—
 - (a) on any frequency removed by 2 kHz or more up to 6 kHz from the assigned frequency: at least 25 dB;

- (b) on any frequency removed by 6 kHz or more up to 10 kHz from the assigned frequency: at least 35 dB;
- (c) on any frequency removed from the assigned frequency by 10 kHz or more—
 - (i) aircraft station transmitters: 40 dB;
 - (ii) aeronautical station transmitters:

$$[43 + 10 \log_{10} P_m (W)] \text{ dB}$$

(2) For aircraft station transmitters first installed after 1 February 1983 and for aeronautical station transmitters in use as of 1 February 1983 and using single sideband classes of emission H2B, H3E, J3E, J7B or J9B, the peak envelope power (Pp) of any emission on any discrete frequency shall be less than the peak envelope power (Pp) of the transmitter in accordance with the following—

- (a) on any frequency removed by 1.5 kHz or more up to 4.5 kHz from the assigned frequency: at least 30 dB;
- (b) on any frequency removed by 4.5 kHz or more up to 7.5 kHz from the assigned frequency: at least 38 dB;
- (c) on any frequency removed from the assigned frequency by 7.5 kHz or more—
 - (i) aircraft station transmitters: 43 dB;
 - (ii) aeronautical station transmitters: for transmitter power up to and including 50 W—

$$[43 + 10 \log_{10} P_p (W)] \text{ dB}$$

(iii) For transmitter power more than 50 W: 60 dB.

Note.— See Figures 15-1 and 15-2.

12. Power

- (1) Aeronautical station installations. Except as permitted by the relevant provisions of Appendix S27 to the ITU Radio Regulations, the peak envelope power (Pp) supplied to the antenna transmission line for H2B, H3E, J3E, J7B or J9B classes of emissions shall not exceed a maximum value of 6 kW.
- (2) Aircraft station installations. The peak envelope power supplied to the antenna transmission line for H2B, H3E, J3E, J7B or J9B classes of emission shall not exceed 400 W except as provided for in Appendix S27 of the ITU Radio Regulations as follows—
 - (a) S27/68-it is recognised that the power employed by aircraft transmitters may, in practice, exceed the limits specified in No. 27/60, however, the use of such increased power (which normally should not exceed 600 W Pp) shall not cause harmful interference to stations using frequencies in accordance with the technical principles on which the Allotment Plan is based;
 - (b) S27/60- unless otherwise specified in this Schedule, the peak envelope powers supplied to the antenna transmission line shall not exceed the maximum values indicated in the table below; the corresponding peak effective radiated powers being assumed to be equal to two-thirds of these values-

Figure 15-1. Required spectrum limits (in terms of Mean power) for aircraft station transmitter types and for aeronautical station transmitters first installed before 1 February 1983.

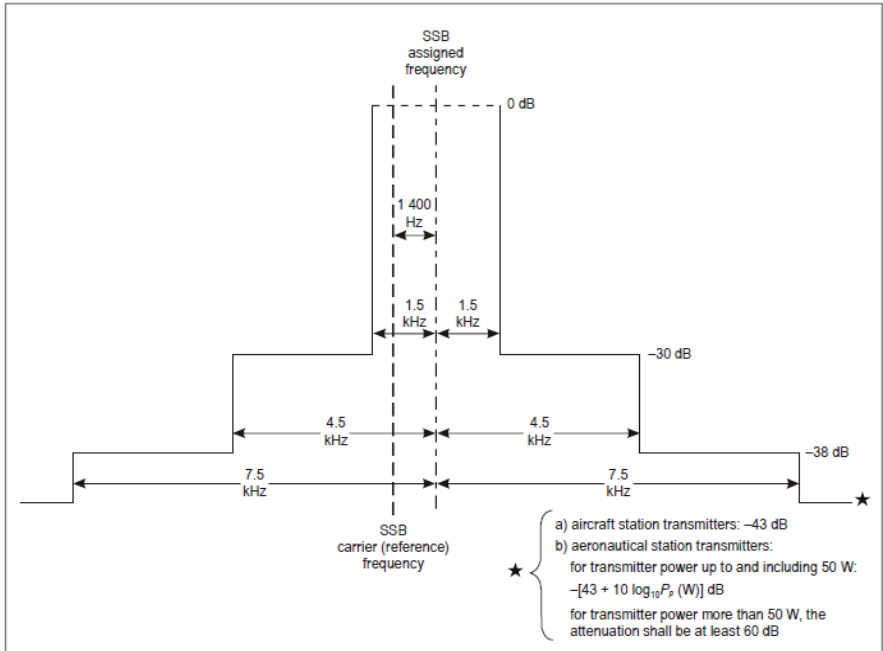
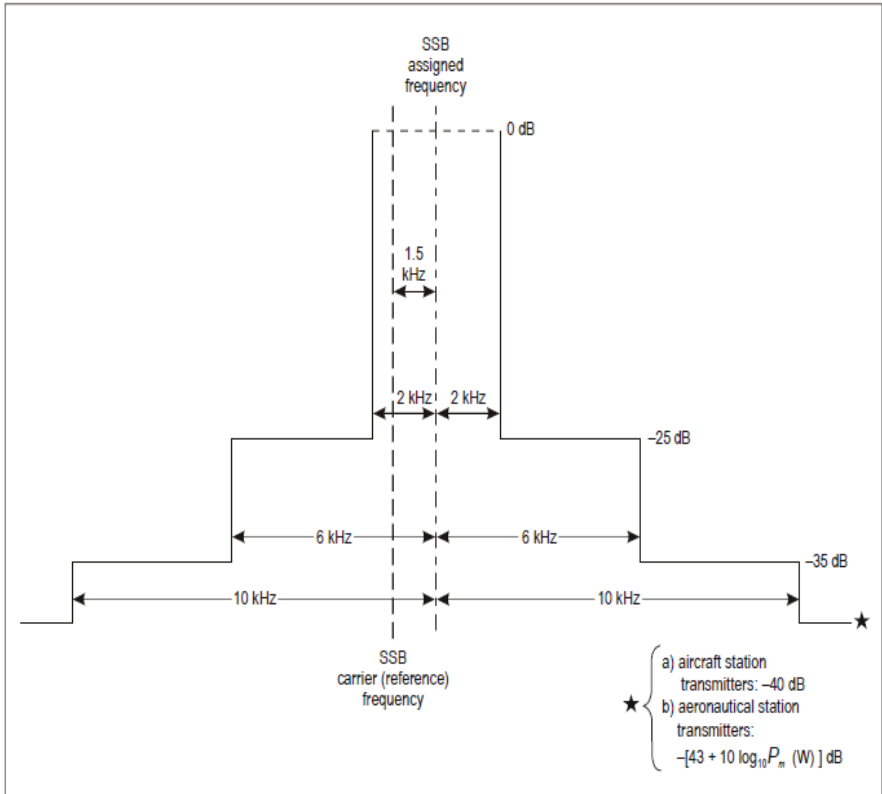


Figure 2-2. Required spectrum limits (in terms of peak power) for aircraft station transmitters first installed after 1 February 1983 and aeronautical station transmitters in use after 1 February 1983

Figure 15-2. Required spectrum limits (in terms of Mean power) for aircraft station transmitter first installed after 1 February 1983 and for aeronautical station transmitters first installed in use after 1 February 1983



SCHEDULE 16

SELCAL SYSTEM

Regulation 82

1. SELCAL is a signalling method which can alert an individual aircraft that a ground station wishes to communicate with it. SELCAL signals can be transmitted over either high frequency or very high frequency radios.
 - (1) Until 2 November, 2022 where a SELCAL system is installed, the following system characteristics shall be applied—
 - (a) transmitted code. Each transmitted code shall be made up of two consecutive tone pulses, with each pulse containing two simultaneously transmitted tones. The pulses shall be of 1.0 plus or minus 0.25 seconds duration, separated by an interval of 0.2 plus or minus 0.1 second;
 - (b) frequency stability. The frequency of transmitted tones shall be held to plus or minus 0.15 per cent tolerance to ensure proper operation of the airborne decoder;
 - (c) distortion. The overall audio distortion present on the transmitted RF signal shall not exceed 15 per cent;
 - (d) level stability. The RF signal transmitted by the ground radio station shall contain, within 3 dB, equal amounts of the two modulating tones.
 - (e) As of 3 November, 2022, modulation envelope. The combination of tones shall result in a modulation envelope having a nominal modulation percentage as high as possible and in no case less than 60 percent;
 - (f) As of 3 November, 2022, transmitted tones. Tone codes shall be made up of various combinations of the tones listed in the following table and designated by colour and letter as indicated –

**Table 16-1 SELCAL tones designated by colour and letter or number
(applicable as of 3 November 2022)**

| Designation | Frequency (Hz) |
|--------------------|-----------------------|
| Red A | 312.6 |
| Red B | 346.7 |
| Red C | 384.6 |
| Red D | 426.6 |
| Red E | 473.2 |
| Red F | 524.8 |
| Red G | 582.1 |
| Red H | 645.7 |
| Red J | 716.1 |
| Red K | 794.3 |
| Red L | 881.0 |
| Red M | 977.2 |
| Red P | 1 083.9 |
| Red Q | 1 202.3 |
| Red R | 1 333.5 |
| Red S | 1 479.1 |
| Red T | 329.2 |
| Red U | 365.2 |
| Red V | 405.0 |
| Red W | 449.3 |
| Red X | 498.3 |
| Red Y | 552.7 |
| Red Z | 613.1 |
| Red 1 | 680.0 |
| Red 2 | 754.2 |
| Red 3 | 836.6 |
| Red 4 | 927.9 |
| Red 5 | 1 029.2 |
| Red 6 | 1 141.6 |
| Red 7 | 1 266.2 |
| Red 8 | 1 404.4 |
| Red 9 | 1 557.8 |

Note 1.— It shall be noted that the tones are spaced by Log-1 0.045 to avoid the possibility of harmonic combinations.

Note 2.— In accordance with the application principles developed by the Sixth Session of the Communications Division, the only codes at present used internationally are selected from the red group.

Note 3.— The tones Red P, Red Q, Red R, and Red S are applicable after 1 September 1985.

SCHEDULE 17

EMERGENCY LOCATOR TRANSMITTER CODING

Regulation 88(2)

Note.— A detailed description of beacon coding is contained in Specification for COSPAS-SARSAT 406 MHz Distress Beacons (C/S T.001). The following technical specifications are specific to emergency locator transmitters used in aviation.

1. General

- (1) The emergency locator transmitter (ELT) operating on 406 MHz shall have the capacity to transmit a programmed digital message which contains information related to the ELT or the aircraft on which it is carried.
- (2) The ELT shall be uniquely coded in accordance with subparagraph (3) and be registered with the appropriate authorities.
- (3) The ELT digital message shall contain either the transmitter serial number or one of the following information elements-
 - (a) aircraft operating agency designator and a serial number;
 - (b) 24-bit aircraft address;
 - (c) aircraft nationality and registration marks.
- (4) All ELTs shall be designed for operation with the COSPAS-SARSAT* system and be type approved.

Note.— Transmission characteristics of the ELT signal can be confirmed by making use of the COSPAS-SARSAT Type.

2. ELT coding

- (1) The ELT digital message shall contain information relating to the message format, coding protocol, country code, identification data and location data, as appropriate.
- (2) For ELTs with no navigation data provided, the short message format C/S T.001 shall be used, making use of bits 1 through

112. For ELTs with navigation data, if provided, the long message format shall be used, making use of bits 1 through 144.

- (3) Protected data field shall be as follows—
- (a) the protected data field consisting of bits 25 through 85 shall be protected by an error correcting code and shall be the portion of the message which shall be unique in every distress ELT;
 - (b) a message format flag indicated by bit 25 shall be set to “0” to indicate the short message format or set to “1” to indicate the long format for ELTs capable of providing location data;
 - (c) a protocol flag shall be indicated by bit 26 and shall be set to “1” for user and user location protocols, and “0” for location protocols;
 - (d) a country code, which indicates the State where additional data are available on the aircraft on which the ELT is carried, shall be contained in bits 27 through 36 which designate a three-digit decimal country code number expressed in binary notation;

Note.— Country codes are based on the International Telecommunication Union (ITU) country codes shown in Table 4 of Part I, Volume I of the ITU List of Call Signs and Numerical Identities.

- (e) bits 37 through 39 (user and user location protocols) or bits 37 through 40 (location protocols) shall designate one of the protocols where values “001” and “011” or “0011”, “0100”, “0101”, and “1000” are used for aviation as shown in the examples contained in this Schedule;
- (f) the ELT digital message shall contain either the transmitter serial number or an identification of the aircraft or operator as shown below;

- (g) in the serial user and serial user location protocol (designated by bit 26=1 and bits 37 through 39 being “011”), the serial identification data shall be encoded in binary notation with the least significant bit on the right. Bits 40 through 42 shall indicate type of ELT serial identification data encoded where—
 - (i) “000” indicates ELT serial number (binary notation) is encoded in bits 44 through 63;
 - (ii) “001” indicates aircraft operator (3 letter encoded using modified Baudot code shown in Table 17-1) and a serial number (binary notation) are encoded in bits 44 through 61 and 62 through 73, respectively;
 - (iii) “011” indicates the 24-bit aircraft address is encoded in bits 44 through 67 and each additional ELT number (binary notation) on the same aircraft is encoded in bits 68 through 73.
- (h) certificate Number which is a unique number assigned by COSPAS-SARSAT for each approved ELT model, as part of the ELT message;
 - (i) bits 84 and 85 (user or user location protocol) or bit 112 (location protocols) shall indicate any homing that may be integrated in the ELT;
- (j) in standard and national location protocols, all identification and location data shall be encoded in binary notation with the least significant bit right justified. The aircraft operator designator (3 letter code) shall be encoded in 15 bits using a modified Baudot code (Table 17-1) using only the 5 right most bits per letter and dropping the left most bit which has a value of 1 for letters.

Table 17-1 Modified Baudot code

| Letter | Code | | Figure | Code | |
|--------|--------|-----|--------|--------|-----|
| | MSB | LSB | | MSB | LSB |
| A | 111000 | | (-)* | 011000 | |
| B | 110011 | | | | |
| C | 101110 | | | | |
| D | 110010 | | | | |
| E | 110000 | | 3 | 010000 | |
| F | 110110 | | | | |
| G | 101011 | | | | |
| H | 100101 | | | | |
| I | 101100 | | | | |
| J | 111010 | | 8 | 001100 | |
| K | 111110 | | | | |
| L | 101001 | | | | |
| M | 100111 | | | | |
| N | 100110 | | | | |
| O | 100011 | | 9 | 000011 | |
| P | 101101 | | 0 | 001101 | |
| Q | 111101 | | 1 | 011101 | |
| R | 101010 | | 4 | 001010 | |
| S | 110100 | | | | |
| T | 100001 | | 5 | 000001 | |
| U | 111100 | | 7 | 011100 | |
| V | 101111 | | | | |
| W | 111001 | | 2 | 011001 | |
| X | 110111 | | / | 010111 | |
| Y | 110101 | | 6 | 010101 | |
| Z | 110001 | | | | |
| () ** | 100100 | | | | |

MSB = most significant bit

LSB = least significant bit

* = hyphen

** = space

Cross References

1. Civil Aviation (Aeronautical Frequency Management) Regulations, 2020 S.I. No. 19 of 2020.
2. Civil Aviation (Air Traffic Services) Regulations, 2020 S.I. No. 74 of 2022
3. Civil Aviation (Certification of Air Navigation Services) Regulations, 2020 S.I. No. 80 of 2022
4. Civil Aviation (Communication Procedures) Regulations, 2022 S.I. No. 69 of 2022.
5. Civil Aviation (Radio Navigation Aids) Regulations, 2022 S.I. No. 72 of 2022
6. Civil Aviation (Surveillance and Collision Avoidance Systems) Regulations, 2022 S.I. No. 93 of 2022

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STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 78

**THE CIVIL AVIATION (APPROVED MAINTENANCE
ORGANISATIONS) REGULATIONS, 2022.**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 78

The Civil Aviation (Approved Maintenance Organisations) Regulations, 2022

*(Under sections 34(2) and 61 of the Civil Aviation Authority Act,
Cap. 354)*

IN EXERCISE of the powers conferred upon the Minister by sections 34(2) and 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Approved Maintenance Organisations) Regulations, 2022.

2. Application

These Regulations apply to—

- (a) all persons operating or maintaining an aircraft registered in Uganda wherever the persons may be; and
- (b) the approval of organisations involved in the maintenance of aircraft, engines, propellers and associated parts wherever these may be located.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“acceptable” means the authority has reviewed the method, procedure or policy and has neither objected nor approved its proposed use or implementation;

“accountable manager” means a person who has corporate authority for ensuring that all maintenance activities required by the owner or operator of an aircraft are financed and carried out to the standard required by the authority;

“Act” means the Civil Aviation Authority Act, Cap. 354;

“aeronautical product” means any aircraft, engine, propeller, component or part to be installed thereon;

“aeroplane” means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air, other than the reactions of the air against the earth’s surface;

“aircraft component” means any component part of an aircraft and includes a complete engine or any operational or emergency equipment;

“aircraft type” means all aircraft of the same basic design;

“airframe” means the fuselage, booms, nacelles, cowlings, fairings, airfoil surfaces and landing gear of an aircraft and their accessories and controls;

“airworthiness data” means any information necessary to ensure that an aircraft or aircraft component can be maintained in a condition such that the airworthiness of the aircraft, or serviceability of operational and emergency equipment, as appropriate, is assured;

“airworthiness directive” means a regulatory document which identifies aeronautical products in which an unsafe

condition exists, and where the condition is likely to exist or develop in other aeronautical products of the same type design, it prescribes mandatory corrective actions to be taken or the conditions or limitations under which the aeronautical products may continue to be operated;

“airworthy” means the status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation;

“appliance” means any instrument, mechanism, equipment, part, apparatus, appurtenance or accessory, including communication equipment, that is used or intended to be used in operating or controlling an aircraft in flight, and is installed or attached to the aircraft but is not part of an airframe, power plant or propeller;

“approved” means accepted by a contracting State as suitable for a particular purpose;

“approved data” means technical information approved by the authority;

“approved maintenance organisation” means an organisation approved by the authority to perform specific aircraft maintenance activities;

“approved maintenance program” means a maintenance program approved by the authority;

“approved standard” means a manufacturing, design, maintenance or quality standard approved by the authority;

“article” means any item including an aircraft, airframe, aircraft engine, propeller, appliance, accessory, assembly, subassembly, system, subsystem, component, unit, product, or part;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;

“auxiliary power unit” means a self-contained power-unit on an aircraft providing electrical or pneumatic power to aircraft systems during ground operations;

“calibration” means a set of operations, performed in accordance with a definite documented procedure, that compares the measurement performed by a measurement device or working standard for the purpose of detecting and reporting or eliminating by adjustment errors in the measurement device, working standard or component tested;

“certificate of release to service” means a certification that inspection and maintenance work has been performed satisfactorily in accordance with the methods prescribed by the authority;

“certifying staff” means personnel authorised by the approved maintenance organisation and acceptable to the authority to certify aircraft or aircraft components for release to service;

“competence in civil aviation” means that an individual has the technical qualifications and management experience acceptable to the authority for the position that individual holds;

“composite” means structural materials made of substances including wood, metal, ceramic, graphite, boron, epoxy, plastic and fibre-reinforced built-in strengthening agents that may be in the form of filaments, foils, powders, or flakes of a different material;

“composite structure” means a type of aircraft structure made of plastic resins reinforced with strong light weight filaments;

“continuing airworthiness” means a set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life;

“contracting State” means a State that is a signatory to the Convention;

“control system” means an aircraft system by which the flight path, altitude, or propulsive force of the aircraft is changed, including the flight, engine and propeller controls, the related system controls and the associated operating mechanisms;

“Convention” means the Chicago Convention on International Civil Aviation, 1944;

“currency point” has the value assigned to it in Schedule 1 to these Regulations;

“duplicate inspection” means an initial inspection by an authorised person who assumes full responsibility for the satisfactory completion of the work signing the maintenance release, before being subsequently inspected by a second independent and competent person who attests to the satisfactory completion of the work recorded and that no deficiencies have been found;

“engine” means a unit used or intended to be used for aircraft propulsion, consisting of at least those components and equipment necessary for functioning and control, but does not include the propeller, where applicable;

“facility” means a physical plant including land, buildings and equipment which provide the means for the performance of maintenance, preventive maintenance or modifications of any article;

“fireproof” means the capability to withstand the application of heat by a flame for a period of 15 minutes;

“heavier-than-air aircraft” means any aircraft deriving its lift in flight chiefly from aerodynamic forces;

“housing” means buildings, hangers and other structures that accommodate the necessary equipment and materials of a maintenance organisation that—

- (a) provide working space for the performance of maintenance, preventive maintenance or modifications for which the maintenance organisation is certificated and rated;
- (b) assembly and testing;
- (c) provide structures for the proper protection of aircraft, airframes, aircraft engines, propellers, appliances, components, parts and subassemblies during disassembly, cleaning, inspection, repair, modification; and
- (d) provide for the proper storage, segregation and protection of materials, parts and supplies;

“human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;

“inspection” means the examination of an aircraft or aircraft component to establish conformity with a standard approved by the authority;

“maintenance” means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“maintenance organisations procedures manual” means a document endorsed by the head of the maintenance organisation which details the maintenance organisation’s structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems;

“maintenance programme” means a document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies;

“maintenance records” means records that set out the details of the maintenance carried out on an aircraft, engine, propeller or associated part;

“maintenance release” means a document which contains certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, in accordance with the appropriate airworthiness requirements;

“major modification” in respect of an aeronautical product for which a type certificate has been issued means a change in the type design that has an appreciable effect, other than a negligible effect, on the mass and balance limits, structural strength, engine operation, flight characteristics, reliability, operational characteristics, or other characteristics or qualities affecting the airworthiness or environmental characteristics of an aeronautical product;

“major repair” means a repair of an aeronautical product that might appreciably affect the structural strength, performance, power plant, operation flight characteristics or other qualities affecting airworthiness or environmental characteristics;

“member State” means a State that is party to the Convention;

“modification” means a change to the type design of an aircraft, engine or propeller;

“operator” means a person, organisation or enterprise, engaged in or offering to engage in an aircraft operation;

“overhaul” means the restoration of an aircraft or aircraft component using methods, techniques and practices acceptable to the authority, including—

- (a) disassembling, cleaning or inspection as permitted, repair as necessary and reassembly; and
- (b) testing in accordance with the approved standards and technical data or in accordance with current standards and technical data acceptable to the authority, which have been developed and documented by the State of design, holder of the type certificate, supplemental type certificate or a material, part, process or appliance approval under parts manufacturing authorisation or technical standard order;

“powerplant” means the system consisting of all the engines, drive system components (if applicable), and propellers (if installed), their accessories, ancillary parts, and fuel and oil systems installed on an aircraft but excluding the rotors for a helicopter;

“prescribed” means the authority has issued a written policy or methodology which imposes either a mandatory requirement, where the written policy or methodology states “shall,” or a discretionary requirement if the written policy or methodology states “may”;

“preventive maintenance” means simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations;

“propeller” means a device for propelling an aircraft that has blades on an engine driven shaft and when rotated, produces by its action on the air, a thrust approximately perpendicular to its plane of rotation; and includes control components normally supplied by its rotating air foils of engine;

“quality system” means documented organisational procedures and policies, internal audits of those policies and procedures, management review and recommendations for quality improvement;

“rating” means an authorisation entered on, or associated with a license or certificate and forming part of the licence or certificate, stating special conditions, privileges or limitations pertaining to such license or certificate;

“rebuild” means the restoration of an aircraft or aircraft component by using methods, techniques, and practices acceptable to the authority, after the aircraft or aircraft component has been disassembled, cleaned, inspected as permitted, repaired as necessary, reassembled, and tested to the same tolerances and limits as a new item, using either new parts or used parts;

“repair” means the restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear;

“satisfactory evidence” means a set of documents or activities that a contracting State accepts as sufficient to show compliance with an airworthiness requirement;

“signature” includes a hand-written signature, an electronic or any other form of signature acceptable to the authority;

“specific operating provisions” means a document describing the ratings in detail and containing or referencing material and process specifications used in performing repair work, along with any limitations applied to the maintenance organisation;

“standard” means an object, artefact, tool, test equipment, system or experiment that stores, embodies, or otherwise provides a physical quantity which serves as the basis for measurement of the quantity and includes a document describing the operations and processes that must be performed in order for a particular and to be achieved;

“State of design” means the State having jurisdiction over the organisation responsible for the type design;

“State of manufacture” means the State having jurisdiction over the organisation responsible for the final assembly of the aircraft, engine or propeller;

“State of registry” means the State on whose register an aircraft is entered;

“type certificate” means a document issued by a contracting State to define the design of an aircraft, engine or propeller type and to certify that that design meets the appropriate airworthiness requirements of that State;

“type design” means the set of data and information necessary to define an aircraft, engine or propeller type for the purpose of airworthiness determination;

“validation” means confirmation by a contracting State on the basis of satisfactory evidence that the specific intended use

or application complies with the requirements or standards of the State.

PART II—CERTIFICATION OF MAINTENANCE ORGANISATIONS

4. Requirement for approved maintenance organisation certificate

(1) A person shall not operate a maintenance organisation without, or in violation, of an approved maintenance organisation certificate issued under these Regulations.

(2) An approved maintenance organisation certificate shall consist of—

(a) a certificate issued by the authority; and

(b) specific operating provisions approved by the authority, containing the terms and conditions applicable to the approved maintenance organisation.

(3) The certificate issued to an approved maintenance organisation shall be displayed in the premises of the approved maintenance organisation for inspection by the public and the authority.

(4) The approved maintenance organisation certificate shall be in a form prescribed by the authority in Schedule 2 to these Regulations and shall contain the date of the original issue if this date is different from the date of current issue.

(5) The continued validity of the approval shall depend upon the approved maintenance organisation remaining in compliance with these Regulations.

(6) The approved maintenance organisation shall notify the authority of any changes to the scope of work of the organisation, location or personnel nominated in accordance with these Regulations, within fourteen days of the change.

(7) Where the authority accepts, in whole or in part, an approved maintenance organisation approval issued by another contracting State, such approval and successive changes shall be recognised through a special conditions supplement as determined by the authority in the applicable technical guidance material.

(8) Subject to subregulation (7), the authority shall build an adequate liaison with the contracting State that initially issued the approved maintenance organisation approval.

(9) The approved maintenance organisation certificate shall define the scope of approval for which an approved maintenance organisation is authorised.

(10) An approved maintenance organisation certificate holder shall establish and maintain a safety management system acceptable to the authority as part of certification requirements described in a safety management manual in accordance with the Civil Aviation (Safety Management) Regulations, 2022.

(11) The approved maintenance organisation shall be certificated in accordance with the five-phase process and procedures prescribed by the authority in the applicable technical guidance material.

(12) The certification and continued surveillance shall be carried out in accordance with these Regulations and any other applicable Regulations to ensure that the required standards of maintenance are maintained as prescribed by the authority in the applicable technical guidance material.

5. Application for approved maintenance organisation certificate

(1) An applicant for an approved maintenance organisation certificate shall submit the following documents to the authority within ninety days before the commencement of operations—

- (a) an application in a form and manner prescribed by the authority in the applicable technical guidance material;
- (b) the applicant's maintenance organisation's procedures manual in duplicate;
- (c) a list of the maintenance functions to be performed for the approved maintenance organisation under contract by another approved maintenance organisation;
- (d) a list of all approved maintenance organisation certificates and ratings pertinent to those certificates issued by any other contracting State other than Uganda; and
- (e) documentation of the maintenance organisation's quality system.

(2) The authority may require the applicant to submit specific additional information in respect of the application for an approved maintenance organisation certificate.

6. Issue of approved maintenance organisation certificate

(1) The authority shall issue an approved maintenance organisation certificate where, after inspection, the authority is satisfied that the applicant—

- (a) meets the requirements for holder of an approved maintenance organisation certificate specified under these Regulations; and
- (b) is properly and adequately equipped for the performance of maintenance of aircraft or aircraft components for which it seeks approval.

(2) An approved maintenance organisation certificate shall contain—

- (a) a certificate number specifically assigned to the approved maintenance organisation;

- (b) the maintenance organisation's name, registered address and the location of the main place of business of the approved maintenance organisation;
- (c) the date of issue and period of validity of the certificate;
- (d) the scope of approval in relation to aircraft, aircraft component, specialised maintenance, specific terms and conditions of operations acceptable to the authority;
- (e) the ratings issued to the approved maintenance organisation;
- (f) the issuing authority including the name, title and signature of the issuing authority; and
- (g) the maintenance organisation approval reference number.

(3) The approved maintenance organisation certificate shall be in the form prescribed by the authority in the technical guidance material.

7. Specific operating provisions

- (1) The specific operating provisions shall contain—
 - (a) the certificate number that is specifically assigned to the approved maintenance organisation;
 - (b) the name, location and registered address of the approved maintenance organisation;
 - (c) the class or limited ratings issued in detail, including special approvals and limitations issued;
 - (d) the date of current issue and period of validity; and
 - (e) the signatures of the accountable manager and a person designated to sign on behalf of the authority.

(2) An approved maintenance organisation may perform maintenance, preventive maintenance or modifications on an aircraft, airframe, engine, propeller, appliance, aircraft components or its part

only for which it is rated and within the limitations placed in its specific operating provisions.

8. Class ratings of approved maintenance organisation

(1) The following ratings may be issued to an approved maintenance organisation issued with a certificate under these Regulations—

- (a) airframe ratings—
 - (i) class 1: composite construction of small aircraft;
 - (ii) class 2: composite construction of large aircraft;
 - (iii) class 3: all-metal construction of small aircraft; and
 - (iv) class 4: all-metal construction of large aircraft;
- (b) power plant ratings—
 - (i) class 1: reciprocating engines of 400 horsepower or less;
 - (ii) class 2: reciprocating engines of more than 400 horsepower; and
 - (iii) class 3: turbine engines;
- (c) propeller ratings—
 - (i) class 1 in respect of all fixed pitch and ground adjustable propellers of wood, metal, or composite construction; and
 - (ii) class 2 all other propellers, by make;
- (d) radio ratings—
 - (i) class 1 shall be for communication equipment in respect of any radio transmitting equipment or receiving equipment or both, used in aircraft to send or receive communication in flight, regardless of carrier frequency or type of modulation used;

including auxiliary and related aircraft interphone systems, amplifier systems, electrical or electronic intercrew signaling devices and similar equipment but shall not be in respect of equipment used for navigation of the aircraft or as an aid to navigation, equipment for measuring altitude or terrain clearance, other measuring equipment operated on radio or radar principles or mechanical, electrical, gyroscopic or electronic instruments that are a part of communication radio equipment;

- (ii) class 2 shall be for navigational equipment in respect of any radio system used in aircraft for en route or approach navigation, except equipment operated on radar or pulsed radio frequency principles, but not including equipment for measuring altitude or terrain clearance or other distance equipment operated on radar or pulsed radio frequency principles; and
 - (iii) class 3 shall be for radar equipment in respect of any aircraft electronic system operated on radar or pulsed radio frequency principles;
- (e) instrument ratings—
- (i) class 1 is mechanical in respect of any diaphragm, bourdon tube, aneroid, optical or mechanically driven centrifugal instrument that is used on aircraft or to operate aircraft, including tachometers, airspeed indicators, pressure gauges, drift sights, magnetic compasses, altimeters or similar mechanical instruments;
 - (ii) class 2 is electrical in respect of any self-synchronous and electrical indicating instruments and systems, including remote indicating instruments, cylinder head temperature gauges or similar electrical instruments;

- (iii) class 3 is gyroscopic and includes any instrument or system using gyroscopic principles and motivated by air pressure or electrical energy, including automatic pilot control units, turn and bank indicators, directional gyros and their parts and flux gate and gyrosyn compasses; and
 - (iv) class 4 is electronic and includes any instruments whose operation depends on electron tubes, transistors or similar devices including capacitance type quantity gauges, system amplifiers, and engine analyzers;
- (f) computer systems rating includes—
- (i) class 1 in respect of aircraft computer systems;
 - (ii) class 2 power plant computer systems; and
 - (iii) class 3 avionics computer systems;
- (g) accessory ratings includes—
- (i) class 1 in respect of mechanical accessories that depend on friction, hydraulics, mechanical linkage or pneumatic pressure for operation, including aircraft wheel brakes, mechanically driven pumps, carburetors, aircraft wheel assemblies, shock absorber struts and hydraulic servo units;
 - (ii) class 2 in respect of electrical accessories that depend on electrical energy for their operation and generators, including starters, voltage regulators, electric motors, electrically driven fuel pumps magnetos or similar electrical accessories;
 - (iii) class 3 in respect of electronic accessories that depend on the use of an electron tube transistor or similar device, including supercharger, temperature, air conditioning controls or similar electronic controls; and

- (iv) class 4 in respect of auxiliary power unit that may be installed on aircraft as self-contained units to supplement the engines of the aircraft as a source of hydraulic, pneumatic or electrical power.
- (2) For purposes of these Regulations—
- (a) small aircraft include—
 - (i) aeroplanes below 5,700 kg maximum take-off mass; and
 - (ii) helicopters below 3,175 kg maximum take-off mass; and
 - (b) large aircraft include—
 - (i) aeroplanes of maximum take-off mass of 5,700kg and above; and
 - (ii) helicopters with maximum take-off mass of 3,175kg and above.

9. Limited ratings of approved maintenance organisation

(1) The authority may, where appropriate, issue a limited rating to an approved maintenance organisation that maintains or alters only a particular type of airframe, power plant, propeller, radio, instrument, computer or accessory parts or performs only specialised maintenance requiring equipment and skills not ordinarily found in an approved maintenance organisation with the ratings specified in regulation 8.

(2) A rating issued under subregulation (1) may be limited to—

- (a) a specific model aircraft, engine or constituent part or to any number of parts made by a particular manufacturer;
- (b) airframes of a particular make and model;
- (c) engines of a particular make and model;
- (d) propellers of a particular make and model;

- (e) instruments of a particular make and model;
- (f) computers of a particular make and model;
- (g) radio equipment of a particular make and model;
- (h) accessories of a particular make and model;
- (i) landing gear components;
- (j) floats, by make;
- (k) non-destructive inspection, testing and processing;
- (l) emergency equipment rotor blades, by make and model;
- (m) rotor blades by make and model;
- (n) aircraft fabric work; and
- (o) any other purpose for which the authority finds the request of the applicant appropriate.

(3) A specialised service rating may be issued to an approved maintenance organisation to perform specific maintenance or processes and the specific operating provisions of the approved maintenance organisation shall identify the specification used in performing specialised services which may be—

- (a) a civil or military specification that is currently used by the industry and approved by the authority; or
- (b) a specification developed by the approved maintenance organisation and approved by the authority.

10. Approved maintenance organisation capability

(1) An approved maintenance organisation shall provide equipment and material so that the functions in this regulation, as appropriate to the class or limited rating held or applied for, can be performed as required except for functions that are contracted out.

- (2) For an airframe rating, classes 3 and 4—
- (a) the functions with respect to metal skin and structural components are to—
- (i) repair and replace steel tubes and fittings using the proper welding techniques, when appropriate;
 - (ii) apply anticorrosion treatment to the interior and exterior of parts;
 - (iii) perform simple machine operations;
 - (iv) fabricate steel fittings;
 - (v) repair and replace metal skin;
 - (vi) repair and replace alloy members and components;
 - (vii) assemble and align components using jigs or fixtures;
 - (viii) make up forming blocks or dies; and
 - (ix) repair or replace ribs.
- (b) the functions with respect to wood structure are to—
- (i) repair ribs and spars;
 - (ii) align interior of wings;
 - (iii) repair or replace plywood skin; and
 - (iv) apply treatment against wood decay;
- (c) the functions with respect to fabric covering are to repair fabric surfaces;
- (d) the functions with respect to aircraft control systems are to—
- (i) repair and replace control cables;
 - (ii) rig complete control system;
 - (iii) replace and repair all control system components; or

- (iv) remove and install control system units and components;
- (e) the functions with respect to aircraft systems are to—
 - (i) replace and repair landing gear hinge point components and attachments;
 - (ii) maintain elastic shock absorber units;
 - (iii) conduct landing gear retraction cycle tests;
 - (iv) maintain electrical position indicating and wiring systems;
 - (v) repair and fabricate fuel, pneumatic, hydraulic, and oil lines;
 - (vi) diagnose electrical and electronic malfunctions;
 - (vii) repair and replace electrical wiring and electronic data transmission lines;
 - (viii) install electrical and electronic equipment; and
 - (ix) perform bench check of electrical and electronic components, not to be confused with the more complex functional test after repair or overhaul;
- (f) the functions with respect to assembly operations are to—
 - (i) assemble aircraft components or parts, such as landing gear, wings and controls;
 - (ii) rig and align aircraft components, including the complete aircraft control system;
 - (iii) install power plants;
 - (iv) install instruments and accessories;
 - (v) assemble and install cowlings, fairings, and panels;
 - (vi) maintain and install windshields, windows and panels;

- (vii) jack or hoist complete aircraft; and
- (viii) balance flight control surfaces;
- (g) non-destructive inspection and testing using dye penetrants and magnetic, ultrasonic, radiographic, fluorescent or holographic inspection techniques; and
- (h) the function with respect to inspection of metal structures is the inspection of metal structures using appropriate inspection equipment to perform the inspections required on an aircraft.

(3) An approved maintenance organisation holding a class 1 or 2 airframe rating for composite aircraft shall, in addition to having the capability to perform the appropriate functions in class 1, 2, 3 or 4 airframe ratings, have the following equipment—

- (a) autoclave capable of providing positive pressure and temperature consistent with the materials used;
- (b) a circulating oven with vacuum capability storage equipment, such as freezer, refrigerator, and temperature control cabinets or other definitive storage areas;
- (c) honeycomb core cutters;
- (d) non-destructive inspection equipment such as x-ray, ultrasonic, or other types of acoustic test equipment as recommended by the manufacturer;
- (e) cutting tools, such as carbide saws or router bits, suitable for cutting and trimming composite structures;
- (f) scales adequate to ensure proper proportioning by mass of epoxy adhesive and resins;
- (g) mechanical pressure equipment such as vacuum bagging or sand bags, as appropriate;
- (h) thermocouple probes necessary to monitor cure temperatures;

- (i) hardness testing equipment using heat guns that are thermostatically controlled for curing repairs; and
 - (j) appropriate inspection equipment to perform inspection of composite structures as recommended by the manufacturer and as required for inspection of an aircraft under these Regulations.
- (4) For a power plant rating of class 1 and 2—
- (a) the functions with respect to maintenance and alteration of power plants, including replacement of parts are to—
 - (i) perform chemical and mechanical cleaning;
 - (ii) perform disassembly operations;
 - (iii) replace bushings, bearings, pins, and inserts;
 - (iv) perform heating operations that may involve the use of the recommended techniques that require controlled heating facilities;
 - (v) perform chilling or shrinking operations;
 - (vi) remove and replace studs;
 - (vii) inscribe or affix identification information;
 - (viii) paint power plants and components; and
 - (ix) apply anti corrosion treatment for parts;
 - (b) the functions with respect to inspection of all parts, using appropriate inspection aids are to—
 - (i) determine precise clearances and tolerances of all parts; and
 - (ii) inspect alignment of connecting rods, crankshafts and impeller shafts;

- (c) accomplish routine machine work including ream inserts, bushings, bearings and other similar components and reface valves; and
- (d) the functions with respect to accomplishment of assembly operations are to—
 - (i) perform valve and ignition-timing operations;
 - (ii) fabricate and test ignition harnesses;
 - (iii) fabricate and test rigid and flexible fluid lines;
 - (iv) prepare engines for long or short term storage; and
 - (v) hoist engines by mechanical means.

(5) An approved maintenance organisation holding a class 3 power plant rating shall, in addition to having the capability to perform the appropriate functions required for class 1 and 2 power plant ratings, have the following—

- (a) testing equipment;
 - (b) surface treatment anti-gallant equipment;
 - (c) functional equipment requirements recommended by the manufacturer; and
 - (d) appropriate inspection equipment.
- (6) The functions for the propeller rating class 1 are to—
- (a) remove and install propellers;
 - (b) maintain and alter propellers, including installation and replacement of parts to—
 - (i) replace blade tipping;
 - (ii) refinish wood propellers;
 - (iii) make wood inlays;
 - (iv) refinish plastic blades;

- (v) straighten bent blades within repairable tolerances;
 - (vi) modify blade diameter and profile;
 - (vii) polish and buff; and
 - (viii) perform painting operations;
- (c) inspect components using appropriate inspection aids to inspect—
- (i) propellers for conformity with drawings and specifications of the manufacturer;
 - (ii) hubs and blades for failures and defects using all visual aids, including the etching of parts; and
 - (iii) hubs for wear of splines or key ways or any other defect;
- (d) balance propellers to test—
- (i) for proper track on aircraft; and
 - (ii) for horizontal and vertical unbalance using precision equipment.
- (7) The functions for propeller rating class 2 are to—
- (a) remove and install aircraft propellers, which may include installation and replacement of parts and—
- (i) perform all functions specified for class 1 propellers when applicable to the make and model of propellers in this class;
 - (ii) properly lubricate moving parts; and
 - (iii) assemble complete propeller and sub assemblies using special tools when required;
- (b) inspect components using appropriate inspection aids for those functions specified for class 1 propellers under subregulation (6) (b) and (c) when applicable to the make and model of the propeller being worked on;

- (c) repair or replace components or parts and—
 - (i) replace blades, hubs or any of their components;
 - (ii) repair or replace anti-icing devices;
 - (iii) remove nicks or scratches from metal blades; or
 - (iv) repair or replace electrical propeller components;
- (d) balance propellers, including those functions specified for class 1 propellers under subregulation 6 (d) where applicable to the make and model of the propeller being worked on; and
- (e) test propeller pitch-changing mechanism for—
 - (i) hydraulically operated propellers and components;
or
 - (ii) electrically operated propellers and components.

(8) For radio rating class 1, 2 and 3 the functions of the approved maintenance organisation are to perform physical inspection of radio systems and components by visual and mechanical inspection including—

- (a) performing electrical inspection of radio systems and components by means of appropriate electrical or electronic test equipment;
- (b) checking aircraft wiring, antennas, connectors, relays and other associated avionics components to detect installation faults;
- (c) checking engine ignition systems and aircraft accessories to determine sources of electrical interference;
- (d) checking aircraft power supplies for adequacy and proper functioning;
- (e) removing, repairing and replacing aircraft antennas;
- (f) measuring transmission line attenuation;

- (g) measuring radio component values such as inductance, capacitance, and resistance;
- (h) determining waveforms and phase in avionics equipment when applicable;
- (i) determining proper aircraft radio antenna, lead-in, and transmission-line characteristics and determining proper locations for type of radio equipment to which the antenna is connected;
- (j) determining the operational condition of radio equipment installed in aircraft by using appropriate portable test apparatus;
- (k) testing all types of transistors: solid-state, integrated circuits; or similar devices in equipment appropriate to the class rating; and
- (l) testing radio indicators.

(9) For radio rating class 1, in addition to the functions specified in subregulation (8), the other functions are to—

- (a) test and repair headsets, speakers and microphones;
- (b) measure radio transmitter power output; and
- (c) measure modulation values, noise and distortion in communication equipment.

(10) For radio rating class 2, in addition to the functions specified in subregulation (8), the other functions are to—

- (a) test and repair headsets;
- (b) test speakers;
- (c) measure loop antenna sensitivity by appropriate methods; and
- (d) calibrate to approved performance standards any radio navigational equipment, en route and approach aids or similar equipment, as appropriate to this rating.

(11) For radio rating class 3, in addition to the functions specified in subregulation (8), the other function is to measure transmitter power output.

(12) The functions for computer systems rating class 1, 2, and 3 are to—

- (a) maintain computer systems in accordance with the specifications of the manufacturer, test requirements and recommendations;
- (b) remove, maintain and replace computer systems in aircraft; and
- (c) inspect, test and calibrate computer system equipment, including software.

(13) The functions for instrument rating class 1 are to—

- (a) diagnose instrument malfunctions of the following instruments—
 - (i) rate-of-climb indicators;
 - (ii) altimeters;
 - (iii) airspeed indicators;
 - (iv) vacuum indicators;
 - (v) oil pressure gauges;
 - (vi) hydraulic pressure gauges;
 - (vii) de-icing pressure gauges;
 - (viii) pitot-static tube;
 - (ix) direct indicating compasses;
 - (x) accelerometer;
 - (xi) direct indicating tachometers; and
 - (xii) direct reading fuel quantity gauges;
- (b) inspect, test and calibrate the instruments specified in subregulation (13)(a) on and off the aircraft, as appropriate.

- (14) The functions for instrument rating class 2 are to—
- (a) diagnose instrument malfunctions of the following instruments—
 - (i) tachometers;
 - (ii) synchro scope;
 - (iii) electric temperature indicators;
 - (iv) electric resistance-type indicators;
 - (v) moving magnet-type indicators;
 - (vi) warning units;
 - (vii) selsyn systems and indicators;
 - (viii) self-synchronous systems and indicators;
 - (ix) remote indicating compasses;
 - (x) oil and fuel quantity indicators;
 - (xi) avionics indicators;
 - (xii) ammeters;
 - (xiii) voltmeters; and
 - (xiv) frequency meters; and
 - (b) inspect, test and calibrate the instruments listed in subregulation (14)(a) on and off the aircraft, as appropriate.
- (15) The functions for instrument rating class 3 are to—
- (a) diagnose instrument malfunctions of the following instruments—
 - (i) turn and bank indicators;
 - (ii) directional gyros;
 - (iii) horizon gyros; and
 - (iv) auto pilot control units and components; and

- (b) inspect, test and calibrate the instruments specified in subregulation (15)(a) on and off the aircraft, as appropriate.
- (16) The functions for instrument rating class 4 are to—
 - (a) diagnose instrument malfunctions of the following instruments—
 - (i) capacitance-type quantity gauge;
 - (ii) laser gyros; and
 - (iii) other electronic instruments; and
 - (b) inspect, test and calibrate instruments listed in subregulation (16)(a) on and off the aircraft, as appropriate.

(17) The approved maintenance organisation shall perform the following functions in accordance with the specifications and recommendations of the manufacturer for accessory rating class 1, 2, 3 and 4—

- (a) diagnose accessory malfunctions;
- (b) maintain and alter accessories, including installing and replacing parts; and
- (c) inspect, test and calibrate accessories on and off the aircraft as appropriate.

11. Contracted and subcontracted maintenance functions

(1) An approved maintenance organisation may contract its maintenance functions to another approved maintenance organisation provided that—

- (a) the contracted approved maintenance organisation shall be appropriately rated and capable of performing the work contracted for; and
- (b) the approved maintenance organisation shall ensure that the contracted maintenance work to be performed is in the form of a written maintenance contract accepted by the

authority and detailing the required maintenance functions and the support of the quality functions specified in the applicable technical guidance material.

- (2) Notwithstanding subregulation (1), an approved maintenance organisation may subcontract the maintenance functions to a maintenance organisation which is not approved by the authority provided that—
 - (a) the approved maintenance organisation is approved for work to be subcontracted and have the capability to assess the competence of the subcontractor;
 - (b) the approved maintenance organisation retains responsibility for quality control and release of the subcontracted activities, including the appropriate airworthiness requirements; and
 - (c) the approved maintenance organisation has necessary procedures for the control of the subcontracted activities, together with the terms for the personnel responsible for the management of the approved maintenance organisation.

12. Display of certificate

An approved maintenance organisation shall display the certificate issued by the authority in a conspicuous place on the premises of the approved maintenance organisation for inspection by the public and the authority.

13. Advertising

(1) A maintenance organisation shall not advertise itself as an approved maintenance organisation unless an approved maintenance organisation certificate has been issued to that organisation.

(2) An approved maintenance organisation shall not make any statement, in writing or orally, about itself that is false or is designed to mislead any person.

(3) Where the advertising of a maintenance organisation indicates that it is an approved maintenance organisation, the advertisement shall clearly state the certificate number of that approved maintenance organisation.

14. Validity and renewal of certificate

(1) A certificate issued to an approved maintenance organisation shall be valid for a period of twelve months from the date of issue or renewal, unless a shorter period is specified by the authority or—

- (a) where the authority amends, suspends, revokes or otherwise terminates the certificate;
- (b) the approved maintenance organisation surrenders it to the authority; or
- (c) the approved maintenance organisation suspends operations for more than one hundred and eighty continuous days.

(2) An application for renewal of an approved maintenance organisation certificate shall be made, at least sixty days before the certificate expires, in a form and manner prescribed by the authority in the applicable technical guidance material.

(3) Where a request for renewal is made after the expiry of an approved maintenance organisation certificate, the applicant shall meet the initial application requirements provided for in these Regulations.

(4) Subject to subregulation (1)(a), a certificate issued to an approved maintenance organisation in another contracting State approved under these Regulations, shall be valid for a period of one year from the date of issue or renewal or where the authority prescribes for a shorter period as long as the certificate for the approved maintenance organisation issued by the national authority of another contracting State is still valid.

15. Continued validity of certificate

Unless the approved maintenance organisation certificate has been surrendered, superseded, suspended, revoked or expired, the certificate shall remain valid where—

- (a) the approved maintenance organisation remains in compliance with these Regulations; and
- (b) the authority is granted access to the facilities of the organisation to determine continued compliance with these Regulations.

16. Surrendering certificate

A person issued with an approved maintenance organisation certificate shall, on suspension or revocation of the certificate, surrender the certificate to the authority.

17. Changes to approved maintenance organisation or certificate

(1) An approved maintenance organisation shall notify the authority of any proposal to carry out any changes in the organisation to enable the authority determine compliance with these Regulations and where necessary to amend the approved maintenance organisation certificate.

(2) An approved maintenance organisation shall not effect the following changes without the prior approval of the authority—

- (a) the name of the approved maintenance organisation;
- (b) the location of the approved maintenance organisation;
- (c) additional locations of the approved maintenance organisation;
- (d) the accountable manager;
- (e) any of the management personnel specified in the maintenance procedure manual of the approved maintenance organisation;

- (f) the facilities, equipment, tools, material, procedures, work scope and certifying staff;
- (g) the ratings held by the approved maintenance organisation; and
- (h) items in the procedures manual of the approved maintenance organisation.

(3) The authority may prescribe the conditions under which the approved maintenance organisation may operate while undergoing the changes unless the authority determines that the approval shall be suspended.

(4) An approved maintenance organisation certificate may be suspended by the authority if the changes referred to in subregulation (2) have been made by the approved maintenance organisation without prior approval of the authority.

(5) An application for amendment of an approved maintenance organisation certificate shall be made in the manner prescribed by the authority and where applicable, the approved maintenance organisation shall submit the amendment of the maintenance procedures manual to the authority for approval.

PART III — HOUSING, FACILITIES, EQUIPMENT AND MATERIALS

18. General

An approved maintenance organisation shall have technical data, personnel, housing, facilities, equipment and materials in quantities and the quality that meet the standards specified under these Regulations.

19. Housing and facility requirements

- (1) An approved maintenance organisation shall—
 - (a) provide appropriate, housing and facilities for all planned work in particular, protection from the weather;

- (b) provide a working environment that is appropriate for the tasks carried out and that does not impair the effectiveness of the personnel;
 - (c) provide office accommodation that is appropriate for the management of the planned work, in particular, the management of quality, planning and technical records;
 - (d) provide specific workshops and bays that are segregated and appropriate, to avoid environmental and work area contamination;;
 - (e) provide storage facilities for parts, equipment, tools and materials;
 - (f) provide storage conditions for security of serviceable parts, segregation of serviceable parts from unserviceable parts and for prevention of deterioration and damage to stored items; and
 - (g) avail aircraft hangars that are large enough to accommodate aircraft, during on-going maintenance activities.
- (2) Where the hangar referred to in this regulation is not owned by the approved maintenance organisation, the approved maintenance organisation shall—
- (a) provide evidence to the authority that the approved maintenance organisation is authorised to use the hangar;
 - (b) demonstrate sufficiency of the hangar space to carry out planned base maintenance by preparing a projected aircraft hangar visit plan relative to the maintenance program;
 - (c) update the aircraft hangar visit plan on a regular basis;
 - (d) ensure that the aircraft component maintenance and aircraft component workshops are large enough to accommodate the components on planned maintenance;

- (e) ensure that aircraft hangar and aircraft component workshop structures prevent the ingress of rain, hail, ice, snow, wind and dust;
- (f) ensure that workshop floors are sealed to minimise dust generation;
- (g) demonstrate access to hangar accommodation for usage during adverse weather for minor scheduled work or lengthy defect rectification;
- (h) provide aircraft maintenance staff with an area where the staff may study maintenance instructions and complete maintenance records in a proper manner;
- (i) ensure that hangars used to house aircraft together with office accommodation have a clean, effective and comfortable working environment by ensuring that—
 - (i) temperatures are maintained at a comfortable level;
 - (ii) dust and any other airborne contamination are kept to a minimum and not permitted to reach a level in the work task area where visible aircraft or component surface contamination is evident;
 - (iii) the lighting is such as to ensure each inspection and maintenance task, can be carried out; and
 - (iv) noise levels are not permitted to rise to the point of distracting personnel from carrying out inspection tasks and where it is impractical to control the noise source, such personnel are provided with the necessary personal equipment to stop excessive noise causing distraction during inspection tasks;
- (j) observe the specific environmental conditions as specified in the approved maintenance instructions where a

particular maintenance task requires the application of specific environmental conditions different from those specified in subregulation (l);

- (k) where the working environment for line maintenance deteriorates to an unacceptable level with respect to temperature, moisture, hail, ice, snow, wind, light, dust or other airborne contamination, suspend the particular maintenance or inspection tasks until satisfactory conditions are re-established;
- (l) seal all susceptible systems until acceptable conditions are re-established for both base and line maintenance where dust or other airborne contamination results in visible surface contamination;
- (m) ensure that storage facilities for serviceable aircraft components are clean, well-ventilated and maintained at an even dry temperature to minimise the effects of condensation;
- (n) follow manufacturer standards recommendations for specific aircraft components;
- (o) ensure that storage racks provide sufficient support for large aircraft components so that the component is not distorted; and
- (p) ensure that all aircraft components, wherever practicable, remain packaged in a protective material to minimise damage and corrosion during storage.

20. Equipment, tools and materials

(1) An approved maintenance organisation shall have the necessary equipment, tools and material to perform the approved scope of work and the items shall be under the full control of the approved maintenance organisation.

(2) Equipment and tools shall be available at all times except in the case of any tool or equipment that is so rarely needed that its permanent availability is not necessary.

(3) The authority may exempt an approved maintenance organisation from possessing specific tools and equipment, for the maintenance or repair of an aircraft or aircraft component specified in the certificate of the approved maintenance organisation, if the tools and equipment can be acquired temporarily, by prior arrangement when needed to perform required maintenance or repairs.

(4) The authority may not amend the approval to remove the aircraft or aircraft component on the basis that it is a temporary situation and there is a formal agreement from the approved maintenance organisation to re-acquire tools, equipment or other items before performing any maintenance or repair.

(5) An approved maintenance organisation shall control all the applicable tools, equipment and test equipment used for product acceptance or for making a finding of airworthiness.

(6) An approved maintenance organisation shall ensure that all the applicable tools, equipment and test equipment used for product acceptance or for making a finding of airworthiness are calibrated to ensure correct calibration to a standard acceptable to the authority and traceable to national or international standards.

(7) An approved maintenance organisation shall keep the records of calibrations and the standards used for calibration.

(8) Except as provided in subregulation (6), in the case of foreign manufactured tools, equipment and test equipment, the standard provided by the State of manufacture may be used for approval by the authority.

(9) Where the manufacturer specifies a particular tool, equipment or test equipment then the tool, equipment or test equipment

shall be used unless the manufacturer has identified the use of an equivalent tool or equipment or test equipment.

(10) Except as provided in subregulation (9), tools, equipment or test equipment other than those recommended by the manufacturer shall be acceptable where—

- (a) the approved maintenance organisation has a procedure in the maintenance procedure manual providing for the use of similar tools, equipment or test equipment; and
- (b) the approved maintenance organisation has a program for—
 - (i) the description of the procedures to be used to establish the competence of personnel that make the determination of equivalency of tools, equipment or test equipment;
 - (ii) conducting and documenting the comparison made between the specification of the tool, equipment or test equipment recommended by the manufacturer and the equivalent tool, equipment or test equipment proposed;
 - (iii) ensuring that the limitations, parameters and reliability of the proposed tool, equipment or test equipment are equivalent to the manufacturer's recommended tools, equipment or test equipment;
 - (iv) ensuring that the equivalent tool, equipment or test equipment is capable of performing the appropriate maintenance function, all normal tests, or calibrations and checking all parameters of the aircraft or aircraft component undergoing maintenance or calibration; and
 - (v) ensuring full control of the equivalent tool, equipment or test equipment through an ownership, lease or other legal arrangement by the approved maintenance organisation.

(11) An approved maintenance organisation approved for base maintenance shall have sufficient aircraft access equipment and inspection docking platform such that the aircraft may be properly inspected.

(12) An approved maintenance organisation shall have a procedure for inspecting or servicing equipment, calibrate tools and test equipment on a regular basis and for indicating to users that an item is within any inspection or service calibration time limit.

(13) An approved maintenance organisation shall have a procedure for ensuring that if it uses a primary, secondary or transfer standard for performing calibration, that standard cannot be used to perform maintenance.

(14) A clear system of labeling tools, equipment and test equipment shall be used to give information on when—

- (a) the next inspection, service or calibration is due and where the item is unserviceable for a reason that is not obvious; and
- (b) the tools, equipment and test equipment are not used for product acceptance or for making a finding of airworthiness.

(15) An approved maintenance organisation shall maintain a register for all calibrated tools, equipment and test equipment together with a record of calibrations and standards used.

(16) The inspection, service or calibration on a regular basis referred to in subregulation (12) shall be in accordance with the instruction of the manufacturers of the equipment except where the approved maintenance organisation can show by results that a different time period is appropriate in a particular case and is acceptable to the authority.

21. Approved maintenance organisation personnel and training requirements

(1) An approved maintenance organisation shall appoint as manager a person or group of persons acceptable to the authority, whose responsibilities shall include ensuring that the approved maintenance organisation is in compliance with these Regulations.

(2) A person appointed as manager shall represent the maintenance management structure of the approved maintenance organisation, and shall be responsible for all the functions specified in these Regulations.

(3) A manager appointed under subregulation (2) shall be directly responsible to an accountable manager, who shall be a person acceptable to the authority.

(4) The approved maintenance organisation shall employ the necessary personnel to plan, perform, supervise, inspect and release the work to be performed.

(5) The competence of the personnel involved in maintenance shall be established in accordance with a procedure, and to a standard acceptable to the authority.

(6) A person signing a certificate of release to service shall be qualified in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022 as appropriate to the work performed and as acceptable to the authority.

(7) The maintenance personnel and the certifying staff shall meet the qualification requirements and receive initial and continuation training relevant to their assigned tasks and responsibilities in accordance with a program acceptable to the authority.

(8) The training program established by the approved maintenance organisation shall include training in knowledge and skills related to human performance, including coordination with other maintenance personnel and flight crew.

(9) The functions of the approved maintenance organisation shall be allocated to individual managers or combined in any number of ways, dependent upon the size of the approved maintenance organisation.

(10) An approved maintenance organisation may facilitate the conduct of skill test to determine the competence of an applicant for an aircraft maintenance engineers' licence in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

(11) An approved maintenance organisation that uses aviation repairman specialists shall ensure that each aviation repairman specialist employed by the approved maintenance organisation is authorised in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

(12) An approved maintenance organisation shall have a dangerous goods training programme for its employees, whether full time, part time, temporary or contracted, who are engaged in the following activities—

- (a) the loading, unloading or handling of dangerous goods;
- (b) the design, manufacture, fabrication, inspection, marking, maintenance, reconditioning, repair or testing of packages, containers or packaging components that are represented, marked, certified or sold as qualified for use in transporting dangerous goods;
- (c) the preparation of hazardous materials for transport;
- (d) responsibility for the safety of transportation of dangerous goods;

- (e) the operation of a vehicle used to transport dangerous goods; or
- (f) the suspension of any of the activities listed in paragraph (a) to (e).

(13) An employee of an approved maintenance organisation shall not perform or supervise any work prescribed in subregulation 12 unless he or she has received the approved dangerous goods training.

(14) The dangerous goods training programme of the approved maintenance organisation shall be approved by the authority.

(15) An approved maintenance organisation shall document, in a form and manner acceptable to the authority, the individual employee training records which shall be retained for a minimum of two years.

(16) The approved maintenance organisation shall establish and implement a training programme and procedures for the personnel and staff acceptable to the authority, for maintenance personnel and the certifying staff, to receive sufficient continuing training for up to date knowledge of relevant technology, changes in the standards of aircraft or aircraft component, maintenance organisation procedures and human factors.

22. Management personnel required for approved maintenance organisation

(1) An approved maintenance organisation shall have an accountable manager, acceptable to the authority.

(2) An approved maintenance organisation shall have other qualified personnel with proven competence in civil aviation who shall serve in the following positions or their equivalent—

- (a) head of base maintenance;
- (b) head of line maintenance;

- (c) head of workshop;
- (d) head of quality; and
- (e) head of safety.

(3) For the purposes of subregulation (2), “competence in civil aviation” means technical qualification and management experience of an individual acceptable to the authority.

(4) The authority may approve positions, other than those listed in subregulation (2), where the approved maintenance organisation is able to show that it can perform the approved functions safely under the direction of fewer or different categories of management personnel subject to the size and complexity of the approved maintenance organisation.

(5) The approved maintenance organisation shall make temporal arrangements to ensure continuity of supervision of its functions if maintenance is conducted in the absence of any required management personnel.

(6) A person serving in a required management position in an approved maintenance organisation shall not serve in a similar position in another approved maintenance organisation without the approval of the authority.

(7) The approved maintenance organisation shall employ the necessary personnel to plan, perform, supervise, inspect and release the work to be performed.

23. Qualification and responsibility of accountable manager, head of base maintenance, head of line maintenance, head of workshop, head of quality and head of safety

(1) The accountable manager shall have the following minimum qualifications—

- (a) experience in aviation management;
- (b) knowledge of the Act, regulations made under the Act and materials published by the authority that are applicable to aircraft maintenance;
- (c) knowledge of the maintenance procedures of the approved maintenance organisation; and
- (d) a certificate in a human factors course recognised by the authority.

(2) The accountable manager shall be the chief executive of the approved maintenance organisation with the mandate of ensuring that—

- (a) all the necessary resources to support the approved maintenance organisation are available;
- (b) all commercial and aircraft maintenance operations are financed and carried out to the standard required by the authority and any requirements defined in the approved documents; and
- (c) safety and quality policies are established and promoted.

(3) The accountable manager may delegate all or part his or her functions, in writing, to another person in a key management position within the approved maintenance organisation.

(4) The accountable manager shall notify the authority when he or she delegates his or her responsibilities in accordance with subregulation (3).

(5) The head of base maintenance shall have the following minimum qualifications—

- (a) an aircraft maintenance engineer's licence with aircraft, power plant or avionics ratings for the most complex equipment for which the approved maintenance organisation has applied for or is approved;

- (b) not less than five years' experience in maintaining the same category of aircraft including one year in the capacity of returning aircraft to service;
- (c) training on every aircraft maintained within the approved scope of the approved maintenance organisation; and
- (d) a qualification or award received after a management or supervisory course or three years of managerial experience.

(6) The head of base maintenance shall, depending on the scope of approval of an approved maintenance organisation, be responsible for ensuring that all the maintenance carried out in the hangar is carried out in accordance with the approved aircraft maintenance programme and the applicable technical publications of the manufacturer.

(7) The head line maintenance shall have the following minimum qualifications—

- (a) an aircraft maintenance engineer's licence with appropriate airframe, powerplant or avionics ratings;
- (b) not less than three years' experience in maintaining the same category of aircraft including one year in the capacity of returning aircraft to service; and
- (c) a qualification or award received after a management or supervisory course or three years of managerial experience.

(8) The head of line maintenance shall be responsible for ensuring that all the maintenance required to be carried out on the line, including line defect rectification, is performed in accordance with the aircraft manufacturer's recommendation and maintenance procedures approved by the authority.

(9) The head of workshop shall have the following minimum qualifications—

- (a) an aircraft maintenance engineer's licence with appropriate airframe, powerplant or avionics ratings;

- (b) not less than three years' experience in maintaining components for the same category of aircraft including one year in the capacity of returning components to service; and
- (c) a qualification or award received after a management or supervisory course or three years of managerial experience.

(10) The head of workshop shall be responsible for ensuring that all the work on aircraft components in the workshop and any corrective action resulting from quality compliance monitoring is performed in accordance with the recommendations and maintenance procedures of the manufacturer approved by the authority.

(11) The head of quality shall have the following minimum qualifications—

- (a) an aircraft maintenance engineer's licence;
- (b) not less than five years' experience in the field of aircraft maintenance, three years of which shall have been acquired in quality department; and
- (c) a qualification or award received for quality management or auditing techniques recognised by the authority.

(12) The head of quality shall be responsible for monitoring the compliance of the approved maintenance organisation with these Regulations and requesting for remedial action as may be necessary by the base maintenance manager, line maintenance manager, workshop manager or the accountable manager, as may be appropriate.

(13) The head of safety shall have the following minimum qualifications—

- (a) technical qualification in the field of aircraft maintenance;
- (b) not less than five years' experience in the field of aircraft maintenance;
- (c) successful completion of training in safety management course recognised by the authority; and

- (d) a qualification or award received after a management or supervisory course or three years of managerial experience.

(14) The head of safety shall be responsible for the implementation and maintenance of an effective safety management system.

24. Manhours

(1) An approved maintenance organisation shall have a production manhours plan, acceptable to the authority.

(2) The manhours plan shall show that the approved maintenance organisation has sufficient staff to plan, perform, supervise, inspect and monitor the quality of the work of the organisation, as approved by the authority.

(3) The manhours plan shall relate to the aircraft hangar visit where an approved maintenance organisation is certified for base maintenance.

(4) The approved maintenance organisation shall regularly update the manhours plan.

(5) The approved maintenance organisation shall take into account the work performed on any aircraft registered outside Uganda where the work impacts upon the production of the manhours plan.

(6) The approved maintenance organisation shall ensure that the quality monitoring compliance function relating to man hours is sufficient to meet the requirement of rest and duty limitations, for persons performing maintenance functions.

(7) The approved maintenance organisation shall have a procedure for re-assessing the work intended to be carried out when the actual staff availability is less than the planned staffing level for any particular work shift or period.

25. Assessment of personnel

(1) The approved maintenance organisation shall assess planners, aircraft maintenance engineers, mechanics, supervisors, certifying staff and specialised technicians including NDT and welding of the organisation, for competence through a process established by the approved maintenance organisation and approved by the authority.

(2) The assessment specified in subregulation (1) shall be based on the job description for each post and shall establish that—

- (a) the planners are able to interpret the maintenance requirements into maintenance tasks, and have an appreciation that the planners have no authority to deviate from the aircraft maintenance program;
- (b) the aircraft maintenance engineers and mechanics are able to carry out maintenance tasks to the standard specified in the maintenance instructions and will notify the supervisors of the mistakes requiring rectification, to re-establish the required maintenance standards;
- (c) the supervisors are able to ensure that all the required maintenance tasks are carried out and where not done or where it is evident that a particular maintenance task cannot be carried out in accordance with the maintenance instructions, the issues will be reported and agreed upon by the quality department of the approved maintenance organisation; and
- (d) the certifying staff are able to determine when an aircraft or an aircraft component is or is not ready for release to service.

(3) The planners, supervisors and certifying staff shall demonstrate to the approved maintenance organisation, knowledge of approved maintenance organisation procedures relevant to their particular role.

(4) The approved maintenance organisation shall ensure that personnel who carry out specialised task are appropriately qualified, in accordance with the standards prescribed by the authority.

26. Training of certifying staff

(1) An approved maintenance organisation or a training organisation selected by the approved maintenance organisation shall perform initial and continuing training of the certifying staff.

(2) The approved maintenance organisation shall establish the curriculum and standards for training of personnel and establish pre-qualification standards intended to ensure that a trainee has a reasonable chance of successfully completing the training.

(3) The authority shall approve the training programme, training facilities and the curriculum referred to in subregulation (2).

(4) The training programme to be approved by the authority under subregulation (3) shall include—

- (a) details of the number of personnel to receive initial training to qualify as certifying staff over specified time periods; and
- (b) for maintenance personnel and certifying staff of the approved maintenance organisation, training in knowledge and skills related to live performance including coordination with other maintenance personnel and flight crew.

(5) The approved maintenance organisation or a training organisation selected by the approved maintenance organisation shall examine all the trained personnel at the end of every training course.

(6) All certifying staff of an approved maintenance organisation shall undergo initial training that covers—

- (a) basic engineering theory relevant to the scope of work performed by the approved maintenance organisation;
- (b) specific information on the actual aircraft type on which the person is intended to become a certifying person

including the impact of repairs and system or structural defects; and

- (c) company procedures relevant to the task of the certifying staff.

(7) All certifying staff of an approved maintenance organisation that have undergone initial training shall undertake continuous training in changes in approved maintenance organisation procedures and changes in the standard of aircraft or aircraft component maintained.

(8) A certifying staff employed in an approved maintenance organisation shall not undertake the same responsibilities in another approved maintenance organisation unless approved by the authority.

27. Rest and duty limitations for persons performing maintenance functions in an approved maintenance organisation

(1) A person or an approved maintenance organisation shall not—

- (a) assign maintenance functions for aircraft unless the assignee has had a minimum rest period of eight hours prior to the beginning of duty; or
- (b) schedule a person performing maintenance functions on an aircraft for more than twelve consecutive hours of duty.

(2) A person shall not—

- (a) perform maintenance functions on an aircraft unless that person has had a minimum rest period of eight hours prior to the beginning of duty; or
- (b) perform maintenance functions on an aircraft for more than twelve consecutive hours of duty.

(3) Notwithstanding subregulations (1) and (2), situations involving unscheduled aircraft unserviceability, the persons performing maintenance functions on an aircraft may be continued on duty for—

- (a) up to sixteen consecutive hours; or
- (b) twenty hours in a twenty-four consecutive hour period.

(4) Following unscheduled duty periods, the person performing maintenance functions on an aircraft shall have a mandatory rest period of ten hours.

(5) An approved maintenance organisation shall relieve the person performing maintenance functions, from all duties for twenty-four consecutive hours during any seven consecutive day period.

28. Record of certifying staff

(1) An approved maintenance organisation shall—

- (a) maintain a roster of all the certifying staff;
- (b) the roster shall include details of the scope of the authorisation of the staff; and
- (c) the certifying staff shall be notified in writing of the scope of that authorisation.

(2) The following minimum information shall be kept on record in respect of each certifying person—

- (a) the name;
- (b) the date of birth;
- (c) basic training;
- (d) type of training;
- (e) continuous training;
- (f) experience;
- (g) qualifications relevant to the approval;
- (h) scope of the organisation;
- (i) date of issue of the authorisation;
- (j) expiration date of the authorisation, where appropriate; and

(k) identification number of the authorisation.

(3) The records of the certifying staff shall be controlled by the quality department of the approved maintenance organisation.

(4) The number of persons authorised to access the records system shall be limited to minimise the possibility of records being altered in an authorised manner and to limit confidential records from becoming accessible to unauthorised persons.

(5) The certifying staff shall be given reasonable access, on request, to their records from the approved maintenance organisation.

(6) An approved maintenance organisation shall grant the authority unrestricted access—

(a) to investigate the records system for initial and continued approval; and

(b) when the authority has cause to doubt, the competence of a particular certifying person.

(7) An approved maintenance organisation shall keep the record of a certifying staff for at least two years following a date on which a staff ceases to be in the employment with the approved maintenance organisation or upon withdrawal of the certifying staff authorisation.

(8) The certifying staff shall upon request, be furnished with a copy of their record on leaving the approved maintenance organisation.

(9) The authorisation document issued to the certifying staff under this regulation shall be in a style that makes its scope clear to the certifying staff and the authority, where examination of the document is required and where codes are used to define scope, an interpretation document shall be readily available.

(10) A certifying staff whilst performing his or her duties shall, on request from the authority, produce his or her authorisation document.

PART V—APPROVED MAINTENANCE ORGANISATION
OPERATING RULES

29. Maintenance organisation procedures manual

(1) An approved maintenance organisation shall provide a maintenance organisation procedures manual which may be issued in separate parts for use by maintenance personnel.

(2) The maintenance organisation procedures manual and any subsequent amendments to the maintenance procedures organisation manual shall be approved by the authority prior to use and the copies of all amendments to the procedures manual shall be furnished promptly to all organisations or persons to whom the manual has been issued.

(3) A maintenance organisation procedures manual shall specify the scope of work required of the approved maintenance organisation in order to satisfy the relevant requirements for approval of an aircraft or aircraft component for return to service.

(4) The maintenance organisation procedures manual and any other manual it identifies shall—

- (a) include instructions and information necessary to allow the personnel to perform their duties and responsibilities with a high degree of safety;
- (b) be in a form that is easy to revise and contain a system which allows the personnel of the approved maintenance organisation to determine current revision status;
- (c) have the date of the last revision printed on each page containing the revision;
- (d) not be contrary to any laws of Uganda or the operations specifications of the approved maintenance organisation;

- (e) include a reference to the appropriate civil aviation regulations; and
- (f) have a description of the procedures of the organisation and quality or inspection system in accordance with regulation 30.

(5) Without prejudice to subregulations (1), (2), (3) and (4), a maintenance organisation procedure manual shall contain the following information—

- (a) a statement signed by the accountable manager confirming that the maintenance organisation procedures manual and any associated manuals define the compliance of the approved maintenance organisation with this regulation and shall be complied with at all times;
- (b) a list that describes the duties and responsibilities of the management personnel and the matters in which they may deal directly with the authority on behalf of the approved maintenance organisation;
- (c) a procedure to establish and maintain a current list of the titles and names of the management personnel of the approved maintenance organisation accepted by the authority;
- (d) an organisation chart showing the associated chains of responsibilities of the management personnel;
- (e) a procedure to establish and maintain a current roster of the certifying staff;
- (f) a description of the procedures used to establish the competence of the maintenance personnel;
- (g) a general description of the manpower resources;
- (h) description of the method used for the completion and retention of the maintenance records;

- (i) a description of the procedure for preparing the certificate of release to service and the circumstances under which the certificate of release to service is to be signed;
- (j) a description, where applicable, of additional procedures for complying with the maintenance procedures and requirements of a holder of an air operator certificate;
- (k) a description of the procedures for complying with the service information reporting requirements contained in regulation 37;
- (l) a description of the procedure for receiving, amending and distributing within the maintenance organisation, all the necessary airworthiness data from the type certificate holder or the type design organisation;
- (m) a general description of the facilities located at each physical address specified in the certificate of the approved maintenance organisation;
- (n) a general description of the scope of the work of the approved maintenance organisation relevant to the extent of approval;
- (o) the notification procedure that the approved maintenance organisation is to use when requesting the approval of changes to the organisation of the approved maintenance organisation from the authority;
- (p) the amendment procedure for the maintenance organisation procedures manual, including submission to the authority;
- (q) the procedures of the approved maintenance organisation acceptable to the authority to—
 - (i) ensure good maintenance practices and compliance with the requirements in these Regulations;
 - (ii) establish and maintain an independent quality system to monitor compliance with the adequacy of the procedures;

- (iii) ensure good quality maintenance practices and airworthy aircraft and aircraft components compliance monitoring; and
- (iv) establish a feedback system, acceptable to the authority, to the person or group of persons specified in regulation 22, and ultimately to the accountable manager to ensure corrective action;
- (r) approved maintenance organisation procedures for self-evaluations, including methods and the frequency of such evaluations and procedures for reporting results to the accountable manager for review and action;
- (s) a list of operators, where appropriate, to which the approved maintenance organisation provides aircraft maintenance service;
- (t) a list of organisations performing maintenance on behalf of the approved maintenance organisation;
- (u) a list of the line maintenance locations and procedures of the approved maintenance organisation, where applicable;
- (v) a description of the organisation's procedures and quality or inspection system in accordance with regulation 30;
- (w) the personnel authorised to sign the maintenance release and the scope of the authorisation;
- (x) a description, where applicable, of the additional procedures for complying with the maintenance procedures and requirements of an operator; and
- (y) a description of the procedures for implementing changes affecting the approval of the maintenance organisation.

(6) The list of the personnel and certifying staff referred to in subregulations (5)(b) and (e) may be separate from the approved maintenance organisation procedures manual, but shall be up to date and shall be available for review by the authority, when requested.

(7) The approved maintenance organisation personnel shall be familiar with the parts of the manuals that are relevant to the maintenance work they perform.

(8) The maintenance organisation shall ensure that the procedures manual is amended as necessary to keep the information contained in the manual up to date.

(9) The quality manager of an approved maintenance organisation shall be responsible for—

- (a) monitoring the amendment of the maintenance procedures manual, including the associated procedures manuals; and
- (b) submitting proposed amendments to the authority, incorporating them after approval and furnishing copies of all amendments to the maintenance organisation's procedure manual promptly to all organisations or persons to whom the manual has been issued.

(10) The maintenance procedures manual shall address the following four main areas—

- (a) the management procedures covering the parts previously specified;
- (b) the maintenance procedures covering all aspects of how aircraft components may be accepted from outside sources and how aircraft shall be maintained to the required standard;
- (c) the quality system procedures, including the methods of qualifying mechanics, inspectors, certifying staff and quality audit personnel; and
- (d) the contracted air operator certificate holder procedures and paperwork.

(11) An approved maintenance organisation procedures manual shall be in the format prescribed in Schedule 3 to these Regulations.

(12) An approved maintenance organisation procedures manual shall provide clear guidance to personnel on how the activities included in the approved maintenance organisation approval are managed, their personal responsibilities, and how compliance with the appropriate continuing airworthiness requirements is achieved.

(13) An approved maintenance organisation shall specify in the approved maintenance organisation procedures manual who should amend the manual, particularly in the case where the manual consists of several parts.

(14) The approved maintenance organisation shall constantly amend the procedures manual to keep the information contained in the manual up to date.

30. Maintenance organisation procedures and independent quality system

(1) An approved maintenance organisation shall establish maintenance organisation procedures acceptable to the authority to ensure good maintenance practices and compliance with all the relevant requirements of these Regulations, such that aircraft and aircraft components are properly released to service.

(2) The maintenance organisation procedures established under subregulation (1) shall—

- (a) cover all aspects of maintenance activity and describe standards to which the approved maintenance organisation intends to work;
- (b) take into account the aircraft and aircraft component design and approved maintenance organisation standards; and
- (c) address the provisions and limitations of these Regulations.

(3) An approved maintenance organisation shall establish an independent quality system, acceptable to the authority, to monitor compliance and adequacy of the procedures, and provide a system of inspection for proper maintenance.

(4) The compliance monitoring system referred to in subregulation (3) shall include a feedback system to the designated management person or group of persons directly responsible for the quality system and ultimately to the accountable manager to ensure, where necessary that corrective action is taken.

(5) The quality system established under subregulation (3) shall—

- (a) be under the control of the quality manager that evaluates the maintenance procedures and the correctness of the equivalent safety case process; and
- (b) include a procedure to initially qualify and periodically perform audits on persons performing work on behalf of the approved maintenance organisation.

(6) The quality system of an approved maintenance organisation shall—

- (a) be sufficient to review all maintenance procedures as described in the maintenance procedures manual in accordance with the approved program, once a year, for each aircraft type maintained; and
- (b) indicate when audits are due, when they are completed and establish a system of audit reports to be reviewed by the authority on request.

(7) The audit system established under subregulation (6)(b) shall clearly establish a means by which audit reports containing observations about non-compliance or poor standards are communicated to the accountable manager.

31. Capability list

(1) An approved maintenance organisation shall prepare and retain a current capability list approved by the authority.

(2) An approved maintenance organisation shall not perform maintenance, preventive maintenance or modifications on an article until the article has been listed on the capability list, in accordance with these Regulations.

(3) The capability list referred to in subregulation (2) shall identify each article by make and model, part number, or other nomenclature designated by the manufacturer of that article.

(4) An article shall be listed on the capability list only where the article is within the scope of the ratings and classes of the certificate of the approved maintenance organisation, and only after the approved maintenance organisation has performed a self-evaluation in accordance with these Regulations.

(5) An approved maintenance organisation shall perform the self-evaluation referred to in subregulation (4) to determine that the maintenance organisation has all the facilities, equipment, material, technical data, processes, housing, and trained personnel in place, to perform the work on the article as required by this regulation.

(6) Where an approved maintenance organisation makes a positive determination under subregulation (5), the approved maintenance organisation may list the article on the capability list.

(7) The document of the evaluation referred to in subregulation (4) shall be signed by the accountable manager and shall be retained by the approved maintenance organisation.

(8) The approved maintenance organisation shall, on listing an additional article on its capability list, send a copy of the list to the authority.

(9) The capability list shall be available in the premises, for inspection by the the authority and public.

(10) The self-evaluation must be available in the premises for inspection by the authority.

(11) An approved maintenance organisation shall retain a capability list and self-evaluation report for two years, from the date accepted by the accountable manager.

(12) Prior to the approval of an amended capability list for inclusion of an article, the authority shall evaluate the approved maintenance organisation in accordance with regulation 5.

32. Approved maintenance organisation privileges

(1) An approved maintenance organisation shall only carry out the following tasks as permitted by the authority and in accordance with its maintenance procedures manual—

- (a) maintain an aircraft or aircraft components for which it is rated at the locations identified in the approval certificate;
- (b) maintain any aircraft for which it is rated at any location subject to the need for such maintenance arising from unserviceability of the aircraft;
- (c) perform the activities in support of a specific air operator certificate holder where that air operator certificate holder has requested the service of the approved maintenance organisation at locations other than the location identified on the approved maintenance organisation certificate, and the approved maintenance organisation has been rated to maintain the aircraft of that specific air operator certificate holder at the requested location in the approved maintenance organisation specific operating provisions approved by the authority; and
- (d) issue a certificate of release to service in respect of paragraphs (a), (b) and (c) on completion of maintenance in accordance with limitations applicable to the approved maintenance organisation.

(2) The approved maintenance organisation may maintain or alter any article for which it is rated at a place other than the approved maintenance organisation location where—

- (a) the function would be performed in the same manner as when performed at the approved maintenance organisation and in accordance with these Regulations;
- (b) all the necessary personnel, equipment, material, and technical or approved standards are available at the place where the work is to be done; or
- (c) the maintenance procedure manual of the station specified the approved procedures to govern the work to be performed at a place other than the location of the approved maintenance organisation.

33. Approved maintenance organisation limitations

(1) An approved maintenance organisation may maintain an aircraft or aircraft component for which it is approved where all the necessary housing, facilities, equipment, tools, material, approved technical data and certifying staff are available.

(2) An approved maintenance organisation shall not provide approval for return to service of a product following contract maintenance, preventive maintenance or alterations without verifying by test or inspection that the work has been performed satisfactorily in accordance with approved methods.

34. Certificate of release to service

(1) A certificate of release to service shall be completed and signed to certify that the maintenance work performed has been completed satisfactorily and in accordance with the approved data and the procedures described in the maintenance procedures manual of the approved maintenance organisation.

(2) An aircraft component, which has been maintained off the aircraft, shall be issued with a certificate of release to service for

such maintenance and another certificate of release to service issued in regard to the proper installation onto the aircraft by an appropriately licensed aircraft maintenance engineer.

- (3) A certificate of release to service shall contain—
 - (a) basic details of the maintenance carried out including detailed reference to the approved data use;
 - (b) the date such maintenance was completed; and
 - (c) the identity, including the authorisation reference, of the approved maintenance organisation and certifying staff issuing the certificate.

- (4) A certificate of release to service is required—
 - (a) before flight, at the completion of any package of maintenance scheduled by the approved aircraft maintenance programme, on the aircraft, whether such maintenance took place as base or line maintenance;
 - (b) before flight, at the completion of any defect rectification, while the aircraft operates between scheduled maintenance; and
 - (c) at the completion of any maintenance on an aircraft component when off the aircraft.

(5) A certificate of release to service shall contain the following statement—

“Certifies that the work specified was carried out in accordance with current regulations and in respect of that work the aircraft or aircraft component is considered ready for release to service.”

(6) The three types of certificates of release to service to be used on different occasions are—

- (a) class 1 certificate of release to service- scheduled aircraft maintenance and major modification;
- (b) class 2 certificate of release to service- component release; and
- (c) class 3 certificate of release to service- unscheduled aircraft maintenance.

(7) Where instructions include a requirement to ensure that a dimension or test figure is within a specific tolerance as opposed to a general tolerance, the dimension or test figure shall be recorded unless the instruction permits the use of “GO” or “NO GO” gauges and, it shall not be sufficient to state that the dimension or the test figure is within tolerance.

(8) When extensive maintenance has been carried out, it is acceptable for the certificate of release to service to summarise the maintenance as long as there is a cross-reference to the work-pack containing full details of maintenance carried out.

(9) The date when the maintenance was carried out shall include when the maintenance took place relative to any life or overhaul limitation in terms of date, flying hours, cycles, landings or some other relevant value, as appropriate.

(10) Dimensional information shall be retained in the work-pack record.

(11) The person issuing the certificate of release to service shall use a full signature and preferably a certification stamp.

(12) Where a computer release to service system is used, the authority shall be satisfied that only the particular person can electronically issue the certificate of release to service.

(13) A certificate of release to service shall reference the data specified in the instructions of the manufacturer or operator

instructions or the approved aircraft maintenance program which itself may cross reference to instructions of a manufacturer in a maintenance manual, service bulletin or other maintenance related document.

35. Maintenance records

(1) An approved maintenance organisation shall record, in a form acceptable to the authority, all details of work carried out and shall retain detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

(2) An approved maintenance organisation shall provide a copy of each certificate of release to service to the aircraft operator, together with a copy of any specific maintenance data used for repairs or modifications carried out.

(3) An approved maintenance organisation shall retain a copy of all the detailed maintenance records and any associated maintenance data in a safe, secure and fireproof environment in a form and format that ensures readability, security and integrity of the records at all times.

(4) An approved maintenance organisation shall retain a copy of all the detailed maintenance records and any associated maintenance data for two (2) years from the date the aircraft or aircraft component to which the work relates was released from the approved maintenance organisation.

(5) The form and format of the records may include paper records, film records, electronic records or a combinations of any of these.

(6) A person who maintains, performs preventive maintenance, rebuilds or modifies an aircraft or aircraft component shall—

- (a) make an entry in the maintenance record of that equipment showing—

- (i) a description of the work carried out and a reference to data acceptable to the authority;
 - (ii) the date of completion of the work carried out;
 - (iii) the name of the person performing the work carried out;
 - (iv) that the work performed on the aircraft or aircraft component has been performed satisfactorily, the signature, licence number or authorisation number and licence category held by the person approving the work; and
 - (v) the authorised signature, which constitutes the approval for return to service, the approved maintenance organisation certificate number and the licence category held by the person approving for return to service, the aircraft, airframe, aircraft engine, propeller, appliance, component part, or portions of these; and
- (b) in addition to the entry specified in paragraph (a), any other entry in a manner prescribed by the authority, in the applicable technical guidance material for major repairs and executed by the person performing the work.

(7) A person shall not describe in any required maintenance entry or form that an aircraft or aeronautical component as being overhauled unless—

- (a) that person uses methods, techniques and practices acceptable to the authority, to disassemble, clean, inspect as permitted, repair as necessary and reassemble that aircraft or aeronautical components; and
- (b) the aircraft or aeronautical component has been tested in accordance with approved standards and technical data, or

in accordance with current standards and technical data acceptable to the authority which have been developed and documented by the holder of the type certificate, supplemental type certificate, or a material, part, process or appliance approval under a technical standing order.

(8) A person shall not describe in any required maintenance entry or form, an aircraft or other aircraft components as being rebuilt unless it has been—

- (a) disassembled, cleaned and inspected as permitted;
- (b) repaired as necessary; or
- (c) reassembled and tested to the same tolerances and limits as a new item, using either new parts or used parts that either conform to new part tolerances and limits, or to approved oversized or undersized dimensions.

(9) A person shall not issue a certificate of release to service to any aircraft or aircraft component that has undergone maintenance, preventive maintenance, rebuilding or modification unless—

- (a) the appropriate maintenance record entry specified in subregulation (6) has been made; and
- (b) the major repair and major modification form referred to in subregulation (6)(b), authorised by or furnished by the authority, has been executed in a manner specified by the authority in the applicable technical guidance material.

(10) Where a repair or modification results in any change in the aircraft operating limitations or flight data contained in the approved aircraft flight manual, those operating limitations or flight data shall be appropriately revised and provided as prescribed by the authority in the applicable technical guidance material.

(11) A person approving for return to service an aircraft or aircraft component, after any inspection performed in accordance with this regulation, shall make an entry in the maintenance record of that equipment containing the following information—

- (a) the type of inspection and a brief description of the extent of the inspection;
- (b) the date of the inspection and aircraft total time in service;
- (c) the authorisation signature, an approved maintenance organisation certificate number and licence category held by the person approving for return to service the aircraft, airframe, aircraft engine, propeller, appliance, component part or portions; and
- (d) where an inspection is conducted under an approved aircraft maintenance program provided for in these Regulations, the entry shall identify the inspection accomplished, and contain a statement that the inspection was performed in accordance with the inspections and procedures prescribed in the approved aircraft maintenance program.

(12) When the person performing any inspection required by this regulation finds that the aircraft is not airworthy or does not meet the requirements of the applicable type certificate data sheet, airworthiness directives, or other approved data upon which that aircraft airworthiness depends, that person shall give the owner a signed and dated list of the discrepancies.

36. Airworthiness data

(1) An approved maintenance organisation shall have airworthiness data appropriate to support the maintenance work performed on the aircraft or aircraft component and the data shall be from the authority, the design organisation or any other approved design organisation in the State of manufacture or State of design.

- (2) Maintenance documents include—

- (a) these Regulations;
- (b) associated advisory material;
- (c) airworthiness directives;
- (d) the manufacturers' maintenance manuals;
- (e) repair manuals;
- (f) supplementary structural inspection documents;
- (g) service bulletins;
- (h) service letters;
- (i) service instructions;
- (j) modification leaflets;
- (k) aircraft maintenance program;
- (l) non-destructive testing manual;
- (m) airworthiness notices issued by the authority; and
- (n) any other relevant document which the authority may specify.

(3) The authority may classify data from another authority or organisation as mandatory and require the approved maintenance organisation to hold such data.

(4) The approved maintenance organisation shall submit to the authority an amendment to the maintenance procedure manual, for any such proposed modifications for acceptance where the approved maintenance organisation modifies airworthiness data specified in subregulation (1) or (2) to a format or presentation more useful for its maintenance activities.

(5) All airworthiness data used by the approved maintenance organisation shall be kept current and made available to all personnel who require access to that data to perform their duties.

(6) An approved maintenance organisation shall establish procedures to monitor the amendment status of all data and maintain a check that all amendments are being received by being a subscriber to document amendment scheme.

(7) Airworthiness data shall be made available in the work area in close proximity to the aircraft or aircraft components being maintained and for supervisors, mechanics and certifying staff to refer to.

(8) Where computer systems are used to maintain airworthiness data, the sufficient number of computer terminals shall be in relation to the size of the work program to enable easy access, unless the computer system can produce paper copies.

(9) Where microfilm or microfiche reader-printers are used, a similar requirement as specified in subregulation 8 is applicable.

37. Reporting of non-airworthy conditions

(1) An approved maintenance organisation shall report to the authority, State of design, State of manufacture, where different from State of design, and the aircraft design organisation, any identified condition that may present a serious hazard to the aircraft.

(2) Reports shall be made in a form and in a manner prescribed by the authority in the applicable technical guidance material and shall contain all pertinent information about the condition known to the approved maintenance organisation including—

- (a) the aircraft registration number;
 - (b) the type, make and model of the article;
 - (c) the date of discovery of the failure, malfunction or defect;
 - (d) the time since the last overhaul, where applicable;
 - (e) the apparent cause of the failure, malfunction or defect;
- and

- (f) any other pertinent information that is necessary for more complete identification and determination of the seriousness or corrective action.

(3) Where the approved maintenance organisation is contracted by an aircraft owner or air operator certificate holder to carry out maintenance, that approved maintenance organisation shall report to the owner or air operator certificate holder any condition affecting the airworthiness of aircraft or aircraft component.

(4) A report shall be made as soon as practicable, not later than three days after identifying the condition to which the report relates.

38. Inspections

(1) An approved maintenance organisation shall allow the authority unlimited access to carry out inspection, at any time, to its facilities and any of its contracted or sub-contracted maintenance facilities, to determine compliance with these Regulations.

(2) Arrangements for maintenance, preventive maintenance, or modifications by a contractor shall include provisions for inspections of the contractor, by the authority.

(3) The authority shall inspect an approved maintenance organisation at least once annually.

(4) The authority shall inspect an approved maintenance organisation in another contracting State approved under these Regulations at least once in every year as long as the approved maintenance organisation certificate issued under the national authority of the contracting State remains valid.

(5) After inspection, the authority shall notify the certificate holder, in writing, of any deficiencies found during the inspection.

39. Performance standards

(1) An approved maintenance organisation that performs any maintenance, preventive maintenance, or modifications on aircraft or aircraft component for an owner or air operator certificate holder certificated under the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022, having an approved maintenance programme shall perform that work in accordance with the owner's approved procedures or the air operator certificate holder's approved procedures.

(2) Except as provided in subregulation (1), each approved maintenance organisation shall perform its maintenance and modification operations in accordance with the applicable requirements in the Civil Aviation (Airworthiness of aircraft) Regulations, 2022.

(3) An approved maintenance organisation shall maintain, in current condition, all the manufacturer's service manuals, instructions, and service bulletins that relate to the articles that it maintains or modifies.

(4) An approved maintenance organisation with an avionics rating shall comply with the requirements of these Regulations that apply to electronic systems, and shall use materials that conform to approved specifications for equipment appropriate to its rating and test apparatus, shop equipment, performance standards, test methods, modifications, and calibrations that conform to the manufacturer's specifications or instructions, approved specification, and where not otherwise specified, in accordance with best industry practices of the aircraft avionics industry.

(5) The approved maintenance organisation shall carry out maintenance on an aircraft in accordance with a maintenance programme, approved by the State of registry which shall contain the following—

- (a) the maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilisation of the aeroplane;

- (b) where applicable, a continuing structural integrity programme;
- (c) the procedure for changing or deviating from the provisions of paragraph (a) or (b); and
- (d) where applicable, the condition monitoring and reliability programme descriptions for aircraft systems, components and engines.

(6) The design and application of the operation's maintenance programme shall observe human factors principles.

PART VI—EXEMPTIONS

40. Application for exemption

(1) A person may apply to the authority for an exemption from any provision of these Regulations.

(2) The authority may in writing exempt a person or an approved maintenance organisation from a specific requirement of these Regulations.

(3) A request for exemption shall be made in accordance with the requirements of these Regulations and an application for such exemption shall be submitted and processed in a manner prescribed in the applicable technical guidance material.

- (4) A request for an exemption of the applicant shall contain—
- (a) the name;
 - (b) the physical address and mailing address;
 - (c) the telephone number;
 - (d) the fax number, where available; and
 - (e) the email address,

(5) The application shall be accompanied by evidence of payment of a fee prescribed by the authority, in the applicable aeronautical information circular for technical evaluation.

41. Exemption

(1) The authority may, upon consideration of the circumstances of a particular approved maintenance organisation, issue an exemption providing relief from specified provisions of these Regulations, provided that—

- (a) the authority finds that the circumstances presented warrant the exemption; and
- (b) a level of safety shall be maintained, equal to that provided by the Regulations from which the exemption is sought.

(2) The exemption referred to in subregulation (1) may be terminated or amended at any time, by the authority.

(3) A person or an approved maintenance organisation who receives an exemption shall have a means of notifying the management and appropriate personnel performing functions subject to the exemption.

PART VII—GENERAL PROVISIONS

42. Possession of licence, certificate, approval or authorisation

A holder of a licence, certificate, approval or authorisation issued by the authority shall have physical possession of the licence, certificate, approval or authorisation or at the work site when exercising the privileges of that licence, certificate, approval or authorisation.

43. Access for inspection

An approved maintenance organisation shall for the purpose of inspection—

- (a) grant the authority unrestricted access to any of its organisation premises, allied facilities and aircraft; and

- (b) ensure that the authority is granted unrestricted access to any organisation or facilities that it has contracted or sub contracted for services associated with maintenance for aircraft or aircraft components.

44. Drug and alcohol testing and reporting

(1) A person who performs any function requiring the approval of the authority shall not exercise the privileges of his or her licence, certificate, approval or authorisation while under the influence of alcohol or any other psychoactive substance, including narcotic drugs, marijuana, depressants, stimulant drugs or substances, which renders him or her unable to exercise the licence, certificate, approval or authorisation privileges safely and properly.

(2) A person who performs any function requiring the approval of the authority under these Regulations may be tested for drug or alcohol usage.

(3) Where the authority requires to test a person referred to in subregulation (2), the blood alcohol concentration (BAC) shall not exceed 0.02%, which is equivalent to 0.2 grams of alcohol per litre of blood, whereas the breathe alcohol concentration (BrAC) shall not exceed 90 micrograms of alcohol per litre of breathe.

(4) Where the authority requires to test a person referred to in subregulation (2) for the percentage by weight of alcohol in the blood or for the presence of psychoactive substance in the body and that person—

- (a) refuses to submit to the test; or
- (b) having submitted to the test, refuses the organisation to release the test results,

the authority may suspend or revoke the certificate of the approved maintenance organisation that employs that person.

(5) The authority shall consider all relevant factors in determining whether to suspend or revoke the certificate of the approved maintenance organisation, including—

- (a) whether the approved maintenance organisation had knowledge of the drug or alcohol use;
- (b) whether the approved maintenance organisation encouraged the person to refuse to take the drug or alcohol test;
- (c) whether the approved maintenance organisation dismissed the person who failed or refused to undertake the drug tests; or
- (d) the position that person held in the approved maintenance organisation.

(6) The authority shall require the approved maintenance organisation to show cause why that person should not be dismissed from the employment of the approved maintenance organisation.

(7) A person who is convicted, whether in or outside Uganda, for any offence relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances, shall be dismissed from the employment of the approved maintenance organisation.

(8) The authority may suspend or revoke the certificate of an approved maintenance organisation that refuses to dismiss from its employment a person convicted under subregulation (7).

45. Inspection of licences, certificates, approvals and authorisation

A person who holds a licence, certificate, approval or authorisation required by these Regulations shall present it for inspection upon a request by the authority or any other person authorised by the authority.

46. Change of name

(1) A holder of a certificate issued under these Regulations may apply to change the name on the certificate.

- (2) The holder of a certificate shall include with the request—
 - (a) the current certificate; and
 - (b) an original legal document verifying the change of name.

(3) The authority may change the name on the certificate and issue a replacement certificate.

(4) The authority shall return to the holder the original documents submitted under subregulation (2)(b) and retain copies of those documents and return the replaced certificate with an endorsement that it has been cancelled.

47. Change of address

(1) A holder of a licence, certificate, approval or authorisation issued under these Regulations shall notify the authority of the change in the physical or mailing address and shall do so in the case of—

- (a) the physical address, at least fourteen days in advance; and
- (b) mailing address, upon the change.

(2) A person who does not notify the authority of the change in the physical address within the time frame specified in subregulation (1) shall not exercise the privileges of the licence, certificate, approval or authorisation that he or she holds.

48. Replacement of documents

A person may apply to the authority on the form and in a manner determined by the authority in the applicable technical guidance materials for replacement of documents issued under these Regulations, when such documents are lost or destroyed.

49. Suspension, revocation or variation of licence, certificate, approval or authorisation

(1) The authority may, where it considers it to be in the public interest, suspend provisionally, pending further investigation any

licence, certificate, approval or authorisation or such other document issued, granted or having effect under these Regulations.

(2) The authority may, upon the completion of an investigation which has shown sufficient ground to its satisfaction and where it considers it to be in the public interest, revoke, suspend, or vary any licence, certificate, approval or authorisation or such other document issued or granted under these Regulations.

(3) The authority may, where it considers it to be in the public interest, prevent any person or aircraft from flying.

(4) A holder or any person having the possession or custody of any licence, certificate, approval or authorisation or such other documents which has been revoked, suspended or varied under these Regulations shall surrender it to the authority within fourteen days from the date of revocation, suspension or variation.

(5) Breach of any condition subject to which any licence, certificate, approval or authorisation or such other document has been granted or issued under these Regulations shall render the document invalid during the continuance of the breach.

50. Use and retention of licence, certificate, approval, authorisation and other records

(1) A person shall not—

(a) use any licence, certificate, approval, authorisation, exemption or other document issued or required by or under these Regulations which has been forged, altered, revoked, suspended, or to which the person is not entitled;

(b) forge or alter any licence, certificate, approval or authorisation, exemption or other document issued or required under these Regulations;

(c) lend any licence, certificate, approval, authorisation, exemption or other document issued or required under these Regulations to any other person; or

(d) make any false representation for the purpose of procuring or for procuring for any other person the grant, issue, renewal or variation of any such licence, certificate, approval, authorisation or exemption or any other document.

(2) A person shall not mutilate, alter, render illegible or destroy any records or any entry made which is required by or under these Regulations to be maintained or knowingly make, or procure or assist in the making of, any false entry in any licence, certificate, approval, authorisation, exemption or willfully omit to make a material entry in such record during the period for which it is required under these Regulations to be preserved.

(3) All records required to be maintained by or under these Regulations shall be recorded in a permanent and indelible material.

(4) A person shall not purport to issue any licence, certificate, approval, authorisation, exemption or any other document for the purpose of these Regulations unless the person is authorised to do so under these Regulations.

(5) A person shall not issue any licence, certificate, approval, authorisation, exemption or any other document of the kind referred to in subregulation (4) unless the person is satisfied that all the statements in the licence, certificate, approval, authorisation, exemption or any other document are correct, and that the applicant is qualified to hold that licence, certificate, approval, authorisation, exemption or any other document.

51. Reports of violation

(1) Any person who knows of a violation against any provision of the Act, or any Regulation made under the Act, shall report the violation to the authority.

(2) The authority shall determine the nature and type of investigation or enforcement action that requires to be taken.

52. Enforcement of directives

Any person who fails to comply with any directive given to the person by the authority under the Act or these Regulations shall be deemed for the purposes of these Regulations to have contravened that Act or these Regulations.

53. Aeronautical user fees

(1) The authority shall notify the fees to be charged in connection with the issue, validation, renewal, extension or variation of any licence, certificate, approval, authorisation or any other document, including the issue of a copy of those or the undergoing of any examination, test, inspection or investigation or the grant of any permission or approval, required by, or for the purpose of these Regulations.

(2) On application being made in connection with which any fee is chargeable in accordance with the provisions of subregulation (1), the applicant shall be required, before the application is entertained, to pay the required fees.

(3) Where, after that payment has been made, the application is withdrawn by the applicant or otherwise ceases to have effect or is refused, the authority, shall not refund the payment made.

54. Extra-territorial application of Regulations

(1) These Regulations shall apply to an aircraft, not being a military aircraft, which belongs to or which is exclusively employed in the service of the Government.

(2) For the purposes of subregulation (1)—

(a) the department or authority which is responsible for the management of the aircraft shall be deemed to be the operator of the aircraft; and

(b) in the case of an aircraft belonging to the Government, the department or authority which is responsible for the

management of the aircraft shall be deemed to be the owner of the interest of the Government, in the aircraft.

(3) Except as otherwise expressly provided, the naval force, military force and air force and the member of any visiting force and the property held or used for the purpose of any of these forces shall be exempt from the provision of these Regulations.

PART VIII—OFFENCES AND PENALTIES

55. Contravention of Regulations

A person who contravenes any provision of these Regulations may have his or her licence, certificate, approval, authorisation or such other document revoked or suspended.

56. Penalties

(1) A person who contravenes any provision of these Regulations commits an offence and is liable on conviction to a fine, and in the case of a continuing contravention, each day of the contravention shall constitute a separate offence.

(2) In case an aircraft is involved in a contravention and the contravention is by the owner or operator of the aircraft, the aircraft shall be subject to a lien for the penalty.

(3) Any aircraft subject to a lien for the purpose of subregulation (2) may be seized by and placed in the custody of the authority.

(4) The aircraft shall be released from custody of the authority upon—

- (a) payment of the penalty or the amount agreed upon in compromise;
- (b) the deposit of a bond with the approved maintenance organisation as the authority may prescribe, conditioned

upon payment of the penalty or the approved maintenance organisation agreed upon in compromise; and

(c) receiving an order of the court to that effect.

(5) The authority and any person specifically authorised by name or any police officer not below the rank of inspector authorised by name by the Minister, may compound offences under Part A of Schedule 4 to these Regulations by assessing the contravention and requiring the person reasonably suspected of having committed the offence to pay to the authority a fine not exceeding fifty currency points for provisions referred to in Part A of Schedule 4 to these Regulations.

(6) If any person contravenes any provision specified in Part B of Schedule 4 to these Regulations, he or she shall be liable, on conviction, to a fine not exceeding one hundred currency points or to imprisonment for a term of twelve months or both.

(7) A person who contravenes any provision of these Regulations not referred to in Schedule 4, commits an offence is liable, on conviction, to a fine not exceeding one hundred currency points or imprisonment not exceeding one year or both and in case of a second or subsequent conviction for the same offence, to a fine not exceeding two hundred currency points or imprisonment not exceeding two years or both.

57. Appeal

Where any person is aggrieved by an order made under these Regulations, the person may, within twenty-one days of such order being made, appeal against the order to the Tribunal established under the Act and the provisions of the Criminal Procedure Act *mutatis mutandis*, shall apply to every such appeal as if it were an appeal against a sentence passed by a higher court in the exercise of its original jurisdiction.

58. Revocation of SI No. 38 of 2020, savings and transition

(1) The Civil Aviation (Approved Maintenance Organisations) Regulations, 2020, are revoked.

(2) A certificate, approval or exemption granted by the authority under the Regulations revoked by subregulation (1) shall remain in force until its expiry, revocation or replacement as if granted under these Regulations.

(3) Notwithstanding the continuance of any certificate, exemption or any other approval granted under subregulation (2), a person who at the commencement of these Regulations is carrying out any act, duty, or operation affected by these Regulations shall, with in six months from the commencement of these Regulations, or within such longer time as the Minister may by, notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) A person who fails to comply with subregulation (3) is liable to have the certificate or exemption or any other approval canceled in accordance with the provisions of these Regulations.

SCHEDULES

SCHEDULE 1

Regulation 3

CURRENCY POINT

A currency point is equivalent to twenty thousand shillings.

SCHEDULE 2

Regulation 4(4)

APPROVED MAINTENANCE ORGANISATION CERTIFICATE

| APPROVED MAINTENANCE ORGANISATION CERTIFICATE | | |
|---|---|---|
| Issuing authority: ¹ | | |
| Approval reference number: ² | Organisation name: ³ Registered address: Telephone: E-mail: | Expiration date (if applicable): ⁴ |
| Class(es) and rating(s) authorized | | |
| Class ⁵ | Rating ⁶ | Limitations ⁷ |
| Aircraft maintenance | | |
| Engine maintenance | | |
| Component maintenance | | |
| Specialized maintenance | | |
| Terms of Approval | | |
| This certificate certifies that ⁸ _____ is authorised to engage in activities specified in the Terms of Approval annexed hereto, subject to the compliance with the ⁹ _____ and the latest maintenance organisation's procedures manual (MOPM). | | |
| Locations of maintenance facilities: As per ¹⁰ _____ of the latest MOPM. | | |
| This certificate shall remain valid during the period of validity specified above unless it is surrendered, superseded, suspended or revoked. | | |
| Name: ¹¹ _____ Date of original issue: ¹² Title: ¹³ _____ | | |
| Date of current issue: ¹⁵ Signature: ¹⁴ | | |

Notes

1. Name of the authority issuing the approval.
2. Unique approval reference number as issued by the State of Registry.
3. Registered address, telephone and email.
4. Expiry date (dd-mm-yyyy) if applicable, if not applicable, insert N/A.
5. Scope of approval using the classes as follows: aircraft, engine, component or specialised maintenance.
6. Scope of approval using the ratings as follows:

- a. aircraft maintenance — large aeroplane, small aeroplane, helicopter, other kind of aircraft (such as glider, balloon, airship, light sport aircraft);
 - b. engine maintenance — categories of engine (such as reciprocating, turbine and electric);
 - c. components maintenance — standard numbering system (SNS) code derived from ASD/ATA S1000D specification for identifying the aircraft system applicable to the rating (*Airworthiness Manual* (Doc 9760, Chapter 10, Attachment F refers); and
 - d. specialised maintenance — class of approval necessary for the specialised maintenance using the following ratings: composite material maintenance, surface treatment such as peening, plating, painting, non-destructive testing, welding, other unique processes accepted/approved by the State (Doc 9760, Chapter 10, Attachment F refers).
7. Limitation in the scope of approval if required for aircraft, components or specialised maintenance. If the limitations are described in the approved maintenance organisation's procedures manual a reference to the manual should be included in the AMO certificate.
 8. Name of organisation authorised to perform maintenance. In the case where a State does not annex terms of approval to the AMO certificate, the State should amend this item as follows:

“This certificate certifies that⁸ _____ i _____ s authorised to engage in activities listed in this certificate, subject to compliance with the _____ and the latest maintenance organisation's procedures manual.”
 9. Reference to relevant State regulations.
 10. Reference to the appropriate section/chapter and paragraph of the maintenance organisation's procedures manual in which the approved locations of the organisation's facilities are listed; for example, Section/Chapter 1, paragraph 1.1.
 11. Name of the authority representative signing the AMO certificate.
 12. Date of original issue (if different from the date of current issue), if not, use N/A.
 13. Title of the authority representative signing the AMO certificate.
 14. Signature of the authority representative. In addition, an official stamp may be applied on the AMO certificate.
 15. Issuance date of the AMO certificate (dd-mm-yyyy).

SCHEDULE 3

Regulation 29 (11)

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Cross References

Criminal Procedure Code Act, Cap. 116.

Civil Aviation (Air Operator Certification and Administration) Regulations, 2022, SI No. 73 of 2022.

Civil Aviation (Airworthiness of Aircraft) Regulations, 2022, SI No. 77 of 2022.

Civil Aviation (Personnel Licensing) Regulations, 2022, SI No. 89 of 2022.

Civil Aviation (Safety Management) Regulations, 2022, SI No. 91 of 2022.

GEN. EDWARD KATUMBA-WAMALA (MP),
Minister of Works and Transport.

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 85

**THE CIVIL AVIATION (OPERATION OF AIRCRAFT) (COMMERCIAL
AIR TRANSPORT) (GENERAL AVIATION) (HELICOPTERS)
REGULATIONS, 2022**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 85

The Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022

(Under section 61(2) of the Civil Aviation Authority Act, Cap 354)

IN EXERCISE of the powers conferred upon the Minister by section 61(2) of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Operation of Aircraft) (Commercial Air Transport) (General Aviation) (Helicopters) Regulations, 2022.

2. Application

These Regulations apply to all helicopters engaged in commercial air transport and general aviation operations, except helicopters engaged in aerial work.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“acts of unlawful interference” means acts or attempted acts aimed at jeopardising the safety of civil aviation and air transport, including—

- (a) unlawful seizure of aircraft in flight;

- (b) unlawful seizure of aircraft on the ground;
- (c) hostage-taking on board an aircraft or on aerodromes;
- (d) forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility;
- (e) introduction on board an aircraft or at an airport of a weapon;
- (f) hazardous device or material intended for criminal purposes; or
- (g) communication of false information as to jeopardise the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility;

“advisory airspace” means an airspace of defined dimensions or designated routes within which air traffic advisory service is available;

“aerial work” means an aeroplane operation in which an aeroplane is used for specialised services including agriculture, construction, photography, surveying, observation and patrol, search and rescue and aerial advertisement;

“aerodrome” means a defined area on land or water, including any buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface;

“aircraft operating manual” means a manual, acceptable to the Authority, containing normal, abnormal and emergency procedures, checklists, limitations, performance

information, details of the aircraft systems and other material relevant to the operation of the aircraft;

“Air Operator Certificate (AOC)” means a certificate authorising an operator to carry out specified commercial air transport operations;

“Air Traffic Service (ATS)” is a generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service, area control service, approach control service or aerodrome control service;

“airworthy” means the status of an aircraft, engine, propeller or part when it conforms to an approved design and is in a condition for safe operation;

“alternate heliport” means a heliport to which a helicopter may proceed when it becomes either impossible or inadvisable for the helicopter to proceed to or to land at the heliport of intended landing where the necessary services and facilities are available, and where aircraft performance requirements may be met and which is operational at the expected time of use and includes the following—

- (a) take-off alternate which is an alternate heliport at which a helicopter would be able to land should this become necessary shortly after take-off and it is not possible to use the heliport of departure;
- (b) en-route alternate which is an alternate heliport at which a helicopter would be able to land in the event that a diversion becomes necessary while en route; and
- (c) destination alternate which is an alternate heliport

at which a helicopter would be able to land should it become either impossible or inadvisable to land at the heliport of intended landing;

“approach and landing phase helicopters” means that part of the flight from 300 m or 1 000 ft above the elevation of the FATO, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point;

“appropriate airworthiness requirements” means the comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration;

“area navigation (RNAV)” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination;

“authority” means the Uganda Civil Aviation Authority established by section 3 of the Act;

“automatic deployable flight recorder (ADFR)” means a combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft;

“automatic landing system” means an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control;

“cabin crew member” means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the Pilot-In-Command of the aircraft, but who

shall not act as a flight crew member;

“combined vision system (CVS)” means a system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS);

“commercial air transport operation” means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire;

“configuration deviation list (CDL)” means a list established by the organisation responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction;

“congested area” means in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes;

“congested hostile environment” means a hostile environment within a congested area;

“continuing airworthiness” means the a set of processes by which an aircraft, engine, rotor or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life;

“continuing airworthiness records” means records which are related to the continuing airworthiness status of an aircraft, engine, rotor or associated part;

“continuous descent final approach (CDFA)” means a technique, consistent with stabilised approach procedures, for flying the final approach segment (FAS) of an instrument of non-precision approach (NPA) procedure as a continuous

descent, without level-off, from an altitude or height at or above the final approach fix altitude or height to a point approximately 15 metres or 50 feet above the landing runway threshold or the point where the flare manoeuvre begins for the type of aircraft flown for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima circling OCA or OCH or visual flight manoeuvre altitude or height are reached;

“crew member” means a person assigned by an operator to duty on an aircraft during a flight duty period;

“currency point “has the value assigned to it in Schedule 1 to these Regulations;

“dangerous goods” means articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Civil Aviation (Safe Transport of Dangerous Goods by Air) Regulations, 2022;

“decision altitude (DA)” means a specified altitude in a three-dimensional or 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established;

“decision height (DH)” means a specified height in a three-dimensional or 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established;

“defined point after take-off (DPATO)” means the point, within the take-off and initial climb phase, before which the helicopter’s ability to continue the flight safely, with one

engine inoperative, is not assured and a forced landing may be required;

“defined point before landing (DPBL)” means the point, within the approach and landing phase, after which the helicopter’s ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required;

“duty” means any task that flight or cabin crew members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue;

“duty period” means a period which starts when a flight or cabin crew member is required by an operator to report for or to commence a duty and ends when that person is free from all duties;

“electronic flight bag (EFB)” means an electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties;

“elevated heliport” means a heliport located on a raised structure on land;

“emergency locator transmitter (ELT)” means an equipment which broadcasts distinctive signals on designated frequencies and, depending on the application, may be activated automatically on impact or be manually, and an ELT may be any of the following—

- (a) automatic fixed ELT or ELT- AF which is an automatically activated ELT which is permanently attached to an aircraft;

- (b) automatic portable ELT or ELT-AP which is an automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft;
- (c) automatic deployable ELT or ELT-AD which is an ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided; or
- (d) survival ELT or ELT or ELTS which is an ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors;

“engine” means a unit used or intended to be used for aircraft propulsion consisting of at least those components and equipment necessary for functioning and control, but excludes the propeller or rotors where applicable;

“enhanced vision system (EVS)” means a system to display electronic real-time images of the external scene achieved through the use of image sensors;

“en-route phase” means that part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase;

“fatigue” means a physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, or workload, mental or physical activity that can impair a person’s alertness and ability to adequately perform safety-related operational duties;

“fatigue risk management system (FRMS)” means data-driven means of continuously monitoring and managing fatigue-

related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness;

“final approach and take-off area (FATO)” means a defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced and in the case where the FATO is to be used by helicopters operating in performance Class 1, the defined area includes the rejected take-off area available;

“final approach segment (FAS)” means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished;

“flight crew member” means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period;

“flight duty period” means a period which commences when a flight or cabin crew member is required to report for duty that includes a flight or a series of flights and which finishes when the aircraft finally comes to rest and the engines are shut down at the end of the last flight on which the flight or cabin crew is a crew member;

“flight manual” means a manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft;

“flight operations officer” means person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, suitably qualified in

accordance with Civil Aviation (Personnel Licensing) Regulations, 2022, and supports, briefs or assists the Pilot-In-Command in the safe conduct of the flight;

“flight plan” means a specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft;

“flight recorder” means any type of recorder installed in the aircraft for the purpose of complementing accident or incident investigation;

“flight safety documents system” means a set of interrelated documentation established by the operator, compiling and organising information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator’s maintenance control manual;

“flight simulation training device” means any one of the following three types of apparatus in which flight conditions are simulated on the ground—

- (a) a flight simulator which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;
- (b) a flight procedures trainer which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class; or

- (c) a basic instrument flight trainer which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions;

“general aviation operation” means an aircraft operation other than a commercial air transport operation or an aerial work operation;

“ground handling” means services necessary for an aircraft’s arrival at, and departure from, an airport, other than air traffic services;

“head-up display (HUD)” means a display system that presents flight information into the pilot’s forward external field of view;

“helicopter” means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

“helicopter flight time” means the total time from the moment a helicopter’s rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped;

“helideck” means a heliport located on a floating or fixed offshore structure;

“heliport” means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters;

“heliport operating minima” means the limits of usability of a heliport for—

- (a) take-off, expressed in terms of runway visual range or visibility and, where necessary, cloud conditions;

- (b) landing in 2D instrument approach operations, expressed in terms of visibility or runway visual range, minimum descent altitude or MDA or minimum descent height MDH and, where necessary, cloud conditions; or
- (c) landing in 3D instrument approach operations, expressed in terms of visibility or runway visual range and decision altitude or DA or descent height or DH as appropriate to the type or category of the operation;

“hostile environment” means an environment in which—

- (a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate;
- (b) the helicopter occupants cannot be adequately protected from the elements;
- (c) search and rescue response or capability is not provided consistent with anticipated exposure; or
- (d) there is an unacceptable risk of endangering persons or property on the ground;

“human factors principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

“human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;

“instrument approach operations” means an approach and landing using instruments for navigation guidance based

on an instrument approach procedure, the methods for executing instrument approach operations—

- (a) a two-dimensional (2D) which is an instrument approach operation, using lateral navigation guidance only; and
- (b) a three-dimensional (3D) which is an instrument approach operation, using both lateral and vertical navigation guidance;

“instrument approach procedure (IAP)” means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows—

- (a) non-precision approach (NPA) procedure which is an instrument approach procedure designed for 2D instrument approach operations Type A;
- (b) approach procedure with vertical guidance (APV) which is a performance based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A; and
- (c) precision approach (PA) procedure which is an instrument approach procedure based on navigation systems or ILS, MLS, GLS and SBAS CAT I designed for 3D instrument approach operations Type A or B;

“instrument meteorological conditions (IMC)” means meteorological conditions expressed in terms of visibility,

distance from cloud, and ceiling, as defined in the Civil Aviation (Rules of the Air) Regulations, 2020 less than the minima specified for visual meteorological conditions;

“integrated survival suit” means a survival suit which meets the combined requirements of the survival suit and life jacket;

“landing decision point (LDP)” means the point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a bailed landing initiated;

“low-visibility operations (LVO)” means approach operations in RVRs less than 550 m or with a DH less than 60 metres or 200 feet or take-off operations in RVRs less than 400 metres;

“maintenance” means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“maintenance organisation’s procedures manual” means a document endorsed by the head of the maintenance organisation which details the maintenance organisation’s structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems;

“maintenance programme” means a document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies;

“maintenance release” means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements;

“Master Minimum Equipment List (MMEL)” means a list established for a particular aircraft type by the organisation responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight;

“maximum mass” means maximum certificated take-off mass;

“Minimum Descent Altitude (MDA)” means a specified altitude in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference;

“Minimum Descent Height (MDH)” means a specified height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference;

“Minimum Equipment List (MEL)” means a list which provides for the operation of an aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type;

“modification” means a change to the type or design of an aircraft, engine or propeller, and may include the embodiment of the modification which is a maintenance task subject to a maintenance release in accordance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022;

“navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace;

“night” means the hours between the end of evening civil twilight and the beginning of morning civil twilight or the time between fifteen minutes after sunset and fifteen minutes before sunrise, sunrise and sunset being determined at surface level, and includes any time between sunset and sunrise when an unlighted aircraft or other unlighted prominent object cannot clearly be seen at a distance of 4,572 metres;

“non-congested hostile environment” means a hostile environment outside a congested area;

“non-hostile environment” means an environment in which—

- (a) a safe forced landing can be accomplished because the surface and surrounding environment are adequate;
- (b) the helicopter occupants can be adequately protected from the elements;
- (c) search and rescue response or capability is provided consistent with anticipated exposure; and
- (d) the assessed risk of endangering persons or property on the ground is acceptable;

“obstacle clearance altitude (OCA)” means the lowest altitude above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria;

“obstacle clearance height (OCH)” means the lowest height above the elevation of the relevant runway threshold or

the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria

“offshore operations” means operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations. Such operations include, but are not limited to, support of offshore oil, gas and mineral exploitation and sea-pilot transfer;

“operation” means an activity or group of activities which are subject to the same or similar hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards;

“operational control” means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight;

“operational flight plan” means the operator’s plan for the safe conduct of the flight based on considerations of helicopter performance, other operating limitations and relevant expected conditions on the route to be followed and at the heliports concerned;

“operations in performance Class 1” means operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area;

“operations in performance Class 2” means operations with performance such that, in the event of critical engine

failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required;

“operations in performance Class 3” means operations with performance such that, in the event of an engine failure at any time during the flight, a forced landing will be required;

“operations manual” means manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties;

“operations specification” means the authorisations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual;

“operator” means the a person, organisation or enterprise engaged in or offering to engage in an aircraft operation;

“operator’s maintenance control manual” means a document which describes the operator’s procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator’s aircraft on time and in a controlled and satisfactory manner;

“owner” means in relation to an aircraft or aerodrome, a person in whose name the aircraft or aerodrome is registered or licensed, any person who is or has been acting as an agent in Uganda or any person by whom the aircraft or aerodrome is hired at the time;

“performance-based communication (PBC)” means communication based on performance specifications applied to the provision of air traffic services;

“performance-based navigation (PBN)” means Area navigation

based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace;

“performance-based surveillance (PBS)” means surveillance based on performance specifications applied to the provision of air traffic services;

“Pilot-In-Command” means the pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight;

“point of no return (PNR)” means the last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight;

“psychoactive substances” means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, others psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded;

“repair” means the restoration of an aircraft, engine or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear;

“required area navigation (RNAV) specification” means a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, and includes RNAV 5, RNAV 1;

“required communication performance (RCP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication;

“required navigation performance (RNP) specification” means navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, and includes RNP 4, RNP APCH;

“required surveillance performance (RSP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance;

“rest period” means a continuous and defined period of time, subsequent to or prior to duty, during which flight or cabin crew members are free of all duties;

“runway visual range (RVR)” means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line;

“safe forced landing” means unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface;

“safety management system (SMS)” means a systematic approach to managing safety, including the necessary organisational structures, accountability, responsibilities, policies and procedures;

“series of flights” means consecutive flights that—

- (a) begin and end within a period of 24 hours; and
- (b) are all conducted by the same Pilot-In-Command;

“specific approval” means an approval which is documented in the operations specifications for commercial air transport

operations or in the list of specific approvals for non-commercial operations;

“State of Registry” means the State on whose register the aircraft is entered;

“state of the aerodrome” means the State in whose territory the aerodrome is located;

“State of Operator” means the State in which the operator’s principal place of business is located or; if there is no such place of business, the operator’s permanent residence;

“State of the principal location of a general aviation operator” means the State in which the operator of a general aviation aircraft has its principal place of business or, if there is no such place of business, its permanent residence;

“synthetic vision system (SVS)” means a system to display data-derived synthetic images of the external scene from the perspective of the flight deck;

“take-off and initial climb phase” means that part of the flight from the start of take-off to 300 m or 1 000 ft above the elevation of the FATO, if the flight is planned to exceed this height, or to the end of the climb in the other cases;

“take-off decision point (TDP)” means the point used in determining take-off performance from which, an engine failure occurring at this point, either a rejected take-off may be made or a take-off safely continued;

“visual meteorological conditions (VMC)” means meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, equal to or better than specified minima;

“VTOSS” means the minimum speed at which a climb shall be achieved with the critical engine inoperative, the remaining engines operating within approved operating limits.

PART II—COMMERCIAL AIR TRANSPORT

4. Operational certification and supervision

(1) An operator shall not engage in commercial air transport operations unless he or she possesses a valid AOC issued by the authority.

(2) The AOC shall authorise the operator to conduct commercial air transport operations in accordance with the operations specifications.

(3) The issuance of an AOC by the authority shall be dependent upon the operator demonstrating an adequate level of organisation, method of control and supervision of flight operations, training programme as well as ground handling and maintenance arrangements consistent with the nature and extent of the operations.

(4) The continued validity of an air operator certificate shall depend upon the operator maintaining the requirements of subregulation (3) under the supervision of the authority.

(5) The AOC shall be in a format prescribed under the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022.

(6) The certification and the continued surveillance of the operator shall be carried out in accordance with the system and procedures established by the authority in the applicable Civil Aviation (Air Operator Certification and Administration) Regulations, 2022, the Civil Aviation (Safety Management) Regulations, 2022 and the applicable technical guidance material to ensure that the required standards of operations established in these Regulations are maintained.

(7) The operator shall develop policies and procedures for third parties that perform work on behalf of the operator.

5. Compliance with laws, regulations and procedures

(1) An AOC holder shall ensure that all personnel when abroad comply with the laws, regulations and procedures of those States in which their operations are conducted.

(2) The AOC holder shall ensure that all pilots are familiar with the laws, regulations and procedures pertinent to the performance of their duties prescribed for the areas to be traversed, the heliports to be used and the air navigation facilities.

(3) The AOC holder shall ensure that other members of the flight crew are familiar with these Regulations and procedures as are pertinent to the performance of their respective duties in the operation of the helicopter.

(4) The AOC holder or a designated representative shall have responsibility for operational control.

(5) The responsibility for operational control shall be delegated only to the Pilot-In-Command and to a flight operations officer where the operator's approved method of control and supervision of flight operations requires the use of flight operations officer or flight dispatcher personnel.

(6) Where an emergency situation which endangers the safety of the helicopter or persons becomes known first to the flight operations officer, action by that person in accordance with regulation 45 shall include notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance when required.

(7) Where an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the Pilot-In-Command shall notify the appropriate local authority without delay.

(8) Where required by the State in which the incident occurs, the Pilot-In-Command shall, within ten days, submit a report on any such violation of local regulation and procedures to the appropriate authority of that State and a copy to the authority.

(9) An AOC holder shall ensure that a Pilot-In-Command has available on board the helicopter all the essential information concerning the search and rescue services in the area over which the helicopter will be flown.

(10) An AOC holder shall ensure that flight crew members demonstrate the ability to speak and understand the English language used for radiotelephony communications as specified in Civil Aviation (Personnel Licensing) Regulations, 2022.

(11) An AOC holder shall ensure that a helicopter—

(a) has equipment and instruments; and

(b) has communication, navigation and surveillance equipment, in the manner provided in the Civil Aviation (Aircraft Instrument and Equipment) Regulations, 2022.

6. Compliance by foreign operator with laws, regulations and procedures of authority

(1) When the authority identifies a case of non-compliance or suspected non-compliance by a foreign operator with laws, regulations and applicable procedures, or similar serious safety issue with that operator, the authority shall immediately notify the operator and, where the issue warrants it, the State of the Operator.

(2) Where the State of Operator and the State of Registry are different, the notification under subregulation (1) shall also be made to the State of Registry, where the issue falls within the responsibilities of that State and warrants a notification.

(3) In the case of notification to States as specified in subregulation (1), where the issue and its resolution warrants it, the State in which the operation is conducted shall engage in consultations with the authority and the State of Registry, where applicable, concerning the safety standards maintained by the operator.

7. Safety management

(1) An air operator certificate holder or operator of a helicopter of a certified take-off mass in excess of 7000kg or having a passenger seating configuration of more than nine passengers and fitted with a flight data recorder shall establish and maintain a flight data analysis programme as part of its safety management system.

(2) Subject to subregulation (1) the AOC holder may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of the flight data analysis programme.

(3) The flight data analysis programme shall contain adequate safeguards to protect the sources of the data in accordance with Civil Aviation (Safety Management) Regulations, 2022.

(4) The AOC holder or operator shall not use recordings or transcripts of CVR, CARS, Class AAIR and Class AAIRS for purposes other than the investigation of an accident or incident in accordance with the Civil Aviation (Accidents and Incidents Investigation) Regulations, 2022 except where the recordings or transcripts are—

- (a) related to a safety-related event identified in the context of a safety management system;
- (b) restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by Civil Aviation (Safety Management) Regulations, 2022;
- (c) sought for use in criminal proceedings not related to an event involving an accident or incident investigation and

are subject to the protections prescribed under the Civil Aviation (Safety Management) Regulations, 2022; or

- (d) used for inspections of flight recorder systems as specified in the Civil Aviation (Aircraft Instruments and Equipment) Regulations, 2022.

(5) The AOC holder or operator shall not use recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS for purposes other than the investigation of an accident or incident prescribed under the Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2022 except where the recordings or transcripts are subject to the protections prescribed by the Civil Aviation (Safety Management) Regulations, 2022 and are—

- (a) used by the operator for airworthiness or maintenance purposes;
- (b) used by the operator in the operation of a flight data analysis programme as provided in these Regulations.;
- (c) sought for use in proceedings not related to an event involving an accident or incident investigation;
- (d) de-identified; or
- (e) disclosed under secure procedures.

(6) The AOC holder or operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system.

8. Dangerous goods

An AOC holder or operator shall adhere to the provisions for carriage of dangerous goods by air in accordance with the Civil Aviation (Safe Transport of Dangerous Goods by Air) Regulations, 2022.

9. Use of psychoactive substances

An AOC holder or operator shall ensure that the provisions concerning the use of psychoactive substances prescribed under the Civil Aviation (Personnel Licensing) Regulations, 2022 and the Civil Aviation (Rules of the Air) Regulations, 2020 are adhered to.

Flight operations

10. Operating facilities

(1) An AOC holder shall ensure that a flight shall not be commenced unless it has been ascertained that the ground or water facilities available and directly required on the flight, for the safe operation of the helicopter and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for that purpose.

(2) An AOC holder or operator shall ensure that inadequacy of facilities observed in the course of operations is reported to the responsible authority without delay.

11. Surveillance of operations by foreign operator

(1) The authority shall recognise as valid an air operator certificate issued by another contracting State provided that the requirements under which the certificate was issued by the authority have been met.

(2) The authority shall carry out surveillance of operations by a foreign operator and take appropriate action when necessary to preserve safety, through a programme and procedures specified in the applicable technical guidance materials.

(3) Subject to subregulation (2) an operator shall meet and maintain the requirements established by the states in which the operations are conducted.

12. Operations manual

(1) An AOC holder or operator shall provide for the use and guidance of operations personnel concerned, an operations manual

developed using the guidance prescribed in the Civil Aviation (Air Operator Certification and Administration) Regulations, 2022.

(2) The operations manual shall be amended or revised as is necessary to ensure that the information is kept up to date and all such amendments or revisions shall be issued to all personnel that are required to use the operations manual.

(3) The AOC holder or operator shall provide a copy of the operations manual together with all amendments and revisions for review, acceptance and where required, approval to the authority.

(4) The AOC holder or operator shall incorporate in the operations manual such mandatory material as the authority may require.

13. General operating instructions

(1) An AOC holder or operator shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of the duties to the operation as a whole.

(2) A helicopter rotor shall not be turned under power, for the purpose of flight, without a qualified pilot at the controls.

(3) The AOC holder or operator shall provide appropriately specific training and procedures to be followed for all personnel, other than qualified pilots, who are likely to carry out the turning of a rotor under power for purposes other than flight.

(4) The AOC holder or operator shall issue operating instructions and provide information on helicopter climb performance with all engines operating to enable the Pilot-In-Command to determine the climb gradient that can be achieved during the take-off and initial climb phase for the existing take-off conditions and intended take-off technique.

(5) The information provided in subregulation (4) shall be based on the helicopter manufacturer's or other data, acceptable to

the authority, and the information shall be included in the operations manual.

14. In-flight simulation of emergency situations

An AOC holder or operator shall ensure that when passengers or cargo are being carried, no emergency or abnormal situations shall be simulated.

15. Checklists

(1) The normal, abnormal and emergency procedures checklists shall be used by flight crew prior to, during and after all phases of operations, and in emergency, to ensure compliance with the operating procedures contained in the aircraft operating manual, the helicopter flight manual or other documents associated with the certificate of airworthiness and in the operations manual.

(2) The AOC holder shall ensure that the design and utilisation of checklists observe human factors principles.

16. Minimum flight altitudes for operations under IFR

(1) An AOC holder or operator shall be permitted to establish minimum flight altitudes for those routes flown for which minimum flight altitudes have been established by the State flown over or the responsible State, provided that they shall not be less than those established by that State, unless specifically approved by the State flown over.

(2) The AOC holder or operator shall specify the method by which it is intended to determine minimum flight altitudes for operations conducted over routes for which minimum flight altitudes have not been established by the State flown over or the responsible state and shall include the method in the operations manual.

(3) The minimum flight altitudes determined in accordance with subregulation (2) shall not be lower than the minimum flight

altitudes specified in Civil Aviation (Rules of the Air) Regulations, 2020.

(4) The method for establishing the minimum flight altitudes shall be approved by the State of the Operator.

(5) Subject to subregulation (4) the State of the Operator shall approve such method only after consideration of the probable effects of the following factors on the safety of the operation—

- (a) the accuracy and reliability with which the position of the helicopter can be determined;
- (b) the inaccuracies in the indications of the altimeters used;
- (c) the characteristics of the terrain such as sudden changes in the elevation;
- (d) the probability of encountering unfavourable meteorological conditions, such as severe turbulence and descending air currents;
- (e) possible inaccuracies in aeronautical charts; and
- (f) airspace restrictions.

17. Heliport or landing location operating minima

(1) An AOC holder or operator shall establish operating minima for each heliport or landing location to be used in operations and the method of determination of the minima shall be approved by the State of the Operator.

(2) The operating minima shall not be lower than any that may be established for the heliports or landing locations by the State of the Aerodrome, except when specifically approved by that State.

(3) The State of the Operator shall authorise operational credit or credits for operations with advanced aircraft.

(4) Where the operational credit relates to low visibility operations, the State of the Operator shall issue a specific approval.

(5) The authorisation specified in subregulation (3) shall not affect the classification of the instrument approach procedure.

(6) Subject to subregulation (5) the operational credit includes—

- (a) for the purposes of an approach ban, a minima below the heliport or landing location operating minima;
- (b) reducing or satisfying the visibility requirements; or
- (c) requiring fewer ground facilities as compensated for by airborne capabilities.

(7) In establishing the operating minima for each heliport or landing location which shall apply to any particular operation, the operator shall take full account of the following—

- (a) the type, performance and handling characteristics of the helicopter and any conditions or limitations stated in the flight manual;
- (b) the composition of the flight crew, their competence and experience;
- (c) the physical characteristics of the heliport, and direction of approach;
- (d) the adequacy and performance of the available visual and non-visual ground aids;
- (e) the equipment available on the helicopter for the purpose of navigation, acquisition of visual references and control of the flight path during the approach, landing and missed approach;

- (f) the obstacles in the approach and missed approach areas and the obstacle clearance altitude or obstacle clearance height for the instrument approach procedures;
 - (g) the means used to determine and report meteorological conditions;
 - (h) the obstacles in the climb-out areas and necessary clearance margins;
 - (i) the conditions prescribed in the operations specifications; and
 - (j) any minima that may be promulgated by the State of the Aerodrome.
- (8) The instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows—
- (a) Type A which is a minimum descent height or decision height at or above 75 metres or 250 feet; and
 - (b) Type B which is a decision height below 75 metres or 250 feet and are categorised as—
 - (i) Category I or CAT I which is a decision height not lower than 60 metres (200 feet) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;
 - (ii) Category II or CAT II which is a decision height lower than 60 metres or 200 feet, but not lower than 30 metres or 100 feet and a runway visual range not less than 300 metres; and
 - (iii) Category III or CAT III which is a decision height lower than 30 m or 100 ft or no decision height and a runway visual range less than 300 m; or no runway visual range limitations.

(9) For purpose of subregulation (8) the required visual reference means that a section of the visual aids or of the approach area should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path, in case of a circling approach operation, the required visual reference is the runway environment.

(10) Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category, this does not apply when the RVR or DH has been approved as operational credits.

(11) The authority shall issue a specific approval for instrument approach operations in low visibility which shall only be conducted when RVR information is provided.

(12) For take-off in low visibility, the authority shall issue a specific approval for the minimum take-off RVR.

(13) A heliport or landing location operating minima below 800 metres visibility shall not be authorised unless RVR information or an accurate measurement or observation of visibility is provided for instrument approach operations.

(14) The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, where necessary, the cloud conditions.

(15) The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility (RVR).

18. Fuel and oil records

(1) An AOC holder or operator shall maintain fuel and oil records to enable the authority to ascertain that, for each flight, the requirements prescribed under regulation 30 are complied with.

(2) The fuel and oil records shall be retained by the operator for a period of three months.

19. Pilot-In-Command

An AOC holder or operator shall designate one pilot to act as Pilot-In-Command for each flight.

20. Passengers

(1) An AOC holder or operator shall ensure that passengers are made familiar with the location and use of—

- (a) seat belts or harnesses;
- (b) emergency exits;
- (c) life jackets, if the carriage of life jackets is prescribed;
- (d) oxygen dispensing equipment, if the provision of oxygen for the use of passengers is prescribed; and
- (e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

(2) The AOC holder or operator shall ensure that the passengers are informed of the location and general manner of use of the principal emergency equipment carried for collective use.

(3) The AOC holder or operator shall ensure that, during take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board a helicopter shall be secured in their seats by means of the seat belts or harnesses provided.

(4) The AOC holder or operator shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

21. Over-water flights

An AOC holder or operator shall ensure that a helicopter on flights operated over water in a hostile environment unless it is certificated for ditching and the state of the sea shall be an integral part of ditching information.

22. Flight preparation

(1) An AOC holder or operator shall ensure that a flight, shall not be commenced until flight preparation forms have been completed certifying that a Pilot-In-Command is satisfied that—

- (a) the helicopter is airworthy;
- (b) the instruments and equipment prescribed under Civil Aviation (Aircraft Instrument & Equipment) Regulations, 2022, for the particular type of operation to be undertaken, are installed and are sufficient for the flight;
- (c) a maintenance release as prescribed under Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 has been issued in respect of the helicopter;
- (d) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
- (e) any load carried is properly distributed and safely secured;
- (f) a check has been completed indicating that the operating limitations as described in this Part of these Regulations can be complied with for the flight to be undertaken; and
- (g) the requirements prescribed under regulation 23 have been complied with.

(2) The AOC holder or operator shall submit to the authority completed flight preparation forms for a period of three months.

23. Operational flight planning

(1) An AOC holder or operator shall complete an operational flight plan for every intended flight or series of flights.

(2) A Pilot-In-Command shall approve the operational flight plan.

(3) The AOC holder or operator shall determine the most efficient means of lodging the operational flight plan.

(4) The operations manual shall describe the content and use of the operational flight plan.

24. Destination alternate heliport

(1) An AOC holder or operator shall ensure a flight conducted in accordance with IFR, at least one destination alternate shall be specified in the operational flight plan and the flight plan, unless—

(a) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the heliport of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions as prescribed by the authority;

(b) the heliport of intended landing is isolated and no alternate is available; and

(c) a point of no return (PNR) is determined.

(2) An AOC holder or operator shall ensure that, before passing the PNR, the following actions have been completed—

(a) confirmation that navigation to the destination and offshore alternate heliport is assured;

- (b) radio contact with the destination and offshore alternate heliport or master station is established;
- (c) the landing forecast at the destination and offshore alternate heliport are obtained and confirmed to be at or above the required minima;
- (d) the requirements for One Engine Inoperative (OEI) landing are verified against the latest reported weather conditions to ensure that they can be met; and
- (e) to the extent possible, having considered information on current and forecast use of the offshore destination alternate heliport, and on conditions prevailing, the availability of the offshore alternate heliport will be guaranteed by the helideck provider until the landing at the destination, or the offshore destination alternate heliport, is achieved.

(3) A heliport selected as a destination alternate, the available information shall indicate that, at the estimated time of use, the conditions shall be at or above the heliport operating minima for that operation.

(4) Where a flight departs to a destination which is forecast to be below the heliport operating minima, two destination alternates shall be selected.

(5) Notwithstanding subregulation (3), the first destination alternate shall be at or above the heliport operating minima for destination and the second at or above the heliport operating minima for alternate.

(6) When an offshore alternate heliport is specified, it shall be specified subject to the following—

- (a) the offshore alternate heliport shall be used only after a PNR;

- (b) prior to a PNR, onshore alternate heliports shall be used;
- (c) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate heliport or heliports;
- (d) one engine inoperative performance capability shall be attainable prior to arrival at the alternate heliport;
- (e) to the extent possible, deck availability shall be guaranteed; and
- (f) weather information shall be reliable and accurate.

(7) An offshore alternate heliport shall not be used when it is possible to carry enough fuel to have an onshore alternate.

(8) The offshore alternate heliports should not be used in a hostile environment.

25. Offshore destination alternate heliport

(1) The State of the operator shall issue a specific approval for the operational use of offshore destination alternate heliports.

(2) A helideck may be specified as an offshore destination alternate heliport when the closest onshore destination alternate is not within achievable range of the helicopter.

(3) The helideck specified under subregulation (2) shall fulfil the following conditions—

- (a) a helideck shall only be used as an offshore destination alternate heliport after the PNR and when an onshore aerodrome is not geographically available;
- (b) the AOC holder or operator shall have a risk assessment process detailed in the operations manual for the utilisation of helidecks as offshore destination alternate heliports and conduct such an assessment prior to their selection and use;

- (c) the AOC holder's or operator's risk assessment process shall take into consideration at least the following—
 - (i) the type and circumstances of the operation;
 - (ii) the area over which the operation is being conducted, including sea conditions, survivability and search and rescue facilities;
 - (iii) the availability and suitability of a helideck for use as an offshore destination alternate heliport including the physical characteristics, dimensions, configuration and obstacle clearance, the effect of wind direction, strength and turbulence;
 - (iv) the type of helicopter being used;
 - (v) mechanical reliability of the helicopter engines and critical control systems and components;
 - (vi) the training and operational procedures, including mitigation of the consequences of helicopter technical failures;
 - (vii) specific mitigation measures;
 - (viii) helicopter equipment;
 - (ix) spare payload capacity for the carriage of additional fuel;
 - (x) weather minima, taking into account the accuracy and reliability of meteorological information; and
 - (xi) communications and aircraft tracking facilities;
- (d) a landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports;

- (e) the operator has established specific procedures and appropriate training programmes in the operations manual for offshore destination alternate heliport operations;
- (f) the operator shall have pre-surveyed, and assessed for suitability, any helideck intended to be used as an offshore destination alternate heliport and with the information published in an appropriate form in the operations manual;
- (g) the helicopter shall have a one engine inoperative (OEI) landing capability at the offshore alternate heliport; and
- (h) the MEL shall contain specific provisions for the one engine inoperative (OEI) operation.

(4) The use of an offshore alternate heliport should be restricted to helicopters which can achieve OEI in ground effect (IGE) hover at an appropriate power rating at the offshore alternate heliport.

(5) Where the surface of the helideck, or prevailing conditions, especially wind velocity, precludes an OEI IGE, OEI out of ground effect (OGE) hover performance at an appropriate power rating should be used to compute the landing mass.

(6) A landing mass should be calculated from graphs provided in the operations manual.

(7) When calculating the landing mass, due account should be taken of helicopter configuration, environmental conditions and the operation of systems that have an adverse effect on performance.

(8) The planned landing mass of the helicopter, including crew, passengers, baggage, cargo and thirty minutes final reserve fuel, should not exceed the OEI landing mass at the time of approach to the offshore alternate heliport.

(9) An offshore alternate shall not be used for payload enhancement.

26. Meteorological conditions for VFR

A flight to be conducted in accordance with VFR shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown or in the intended area of operations under VFR will, at the appropriate time, be such as to enable compliance with these Regulations.

27. Meteorological conditions for IFR

A flight to be conducted in accordance with IFR shall not be commenced unless information is available which indicates that conditions at the destination heliport or landing location or, when an alternate is required, at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

28. Visibility

(1) To ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate heliport or landing location, the operator shall specify appropriate incremental values for height of cloud base and visibility, acceptable to the authority, to be added to the operator's established heliport or landing location operating minima.

(2) An AOC holder or operator shall specify cloud ceiling and visibility criteria relevant to the helideck elevation and location.

(3) Where the AOC holder or operator uses an offshore destination alternate helideck, the operator shall ensure that, within 60 NM of the destination helideck and alternate helideck, fog is not present nor forecasted during the period commencing one hour before and ending one hour after the expected time of arrival at the offshore destination or alternate helideck.

(4) Where the AOC holder or operator uses an offshore destination alternate helideck, the operator shall ensure that the offshore destination alternate shall be more than 30 NM from the

original destination to reduce the likelihood of a localised weather event precluding landings at both the destination and the alternate.

29. Icing conditions

(1) A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.

(2) A flight to be planned or expected to operate in suspected or known ground icing conditions shall not be commenced unless the helicopter has been inspected for icing and, where necessary, has been given appropriate de-icing or anti-icing treatment.

(3) Accumulation of ice or other naturally occurring contaminants shall be removed so that the helicopter is kept in an airworthy condition prior to take-off.

30. Fuel and oil requirements

(1) A helicopter flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that the helicopter can safely complete the flight.

(2) Notwithstanding subregulation (1), a reserve shall be carried to provide for contingencies.

31. Fuel and oil requirements for VFR operations

The fuel and oil carried in order to comply with the requirements under regulation 30 shall, in the case of VFR operations, be at least the amount to allow the helicopter to—

- (a) fly to the landing site to which the flight is planned;
- (b) have final reserve fuel to fly thereafter for a period of twenty minutes at best-range speed; and
- (c) have an additional amount of fuel to provide for the increased consumption on the occurrence of any of the

potential contingencies specified by an AOC holder or operator to the satisfaction of the authority.

32. Fuel and oil requirements for IFR operations

(1) The fuel and oil carried in order to comply with the requirements under regulation 30 shall, in the case of IFR operations, be at least the amount to allow the helicopter—

- (a) where an alternate is not required, in accordance with regulation 24 to fly to and execute an approach at the heliport or landing location to which the flight is planned, the following shall be considered—
 - (i) final reserve fuel to fly thirty minutes at holding speed at 450 metres or 1,500 feet above the destination heliport or landing location under standard temperature conditions and approach and land; and
 - (ii) an additional amount of fuel to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the AOC holder or operator to the satisfaction of the authority;
- (b) where an alternate is required to fly to, and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned, the following shall be considered—
 - (i) fly to, and execute an approach at the alternate specified in the flight plan;
 - (ii) have final reserve fuel to fly for thirty minutes at holding speed at 450 metres or 1,500 feet above the alternate under standard temperature conditions, and approach and land; and

- (iii) have an additional amount of fuel to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the authority;
 - (c) where no alternate heliport or landing location is available, with respect to regulation 24, in circumstances including when the destination is isolated, sufficient fuel shall be carried to enable the helicopter to fly to the destination to which the flight is planned and thereafter for a period that will, based on geographic and environmental considerations, enable a safe landing to be made.
- (2) In computing the fuel and oil required in subregulation (1), at least the following shall be considered—
- (a) meteorological conditions forecast;
 - (b) expected air traffic control routings and traffic delays;
 - (c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;
 - (d) the procedures prescribed in the operations manual for loss of pressurisation, where applicable, or failure of one engine while en route; and
 - (e) any other conditions that may delay the landing of the helicopter or increase fuel or oil consumption.
- (3) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, where applicable, adjustment of the planned operation.

33. Refuelling with passengers on board or rotors turning

- (1) An AOC holder or operator shall not refuel a helicopter, while either rotors are stopped or turning, where—

- (a) passengers are embarking or disembarking; or
- (b) oxygen is being replenished.

(2) Where the AOC holder or operator refuels the helicopter with passengers on board, rotors stopped or turning, the helicopter shall be properly attended to by sufficient qualified personnel, ready to initiate and direct an evacuation by the most practical, safe and expeditious means available.

- (3) In order to achieve the requirements of subregulation (2)—
 - (a) the flight crew shall ensure that the passengers are briefed on what actions to take if an incident occurs during refuelling;
 - (b) a constant two-way communication shall be maintained by the helicopter's intercommunication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the helicopter; and
 - (c) during an emergency shutdown procedure, the flight crew shall ensure that any personnel or passengers outside the helicopter are clear of the rotor area.

(4) The AOC holder or operator shall establish procedures and specify conditions under which such refuelling is to be carried out.

(5) In addition to the requirements of subregulation (2), operational procedures shall specify that at least the following precautions are taken—

- (a) doors on the refuelling side of the helicopter remain closed where possible, unless these are the only suitable exits;
- (b) doors on the non-refuelling side of the helicopter remain open, weather permitting, unless otherwise specified by the rotorcraft flight manual (RFM);

- (c) fire-fighting facilities of the appropriate scale are positioned so as to be immediately available in the event of a fire;
- (d) where the presence of fuel vapour is detected inside the helicopter, or any other hazard arises during refuelling, fuelling shall be stopped immediately;
- (e) the ground or deck area beneath the exits intended for emergency evacuation shall be kept clear;
- (f) seat belts shall be unfastened to facilitate rapid egress; and
- (g) when rotors are turning, only on going passengers shall remain on board.

(6) An AOC holder shall not refuel a helicopter with aviation gasoline, AVGAS or wide-cut type fuel or a mixture of these types of fuel, when passengers are on board.

(7) An AOC holder shall not defuel a helicopter at any time where—

- (a) passengers remain on board;
- (b) passengers are embarking or disembarking; or
- (c) oxygen is being replenished.

34. Oxygen supply

(1) The approximate altitudes in the standard atmosphere corresponding to the values of absolute pressure used in these Regulations shall be as follows—

| <i>Absolute pressure</i> | <i>Metres</i> | <i>Feet</i> |
|--------------------------|---------------|-------------|
| 700 hPa | 3,000 | 10,000 |
| 620 hPa | 4,000 | 13,000 |
| 376 hPa | 7,600 | 25,000 |

(2) An AOC holder shall not commence a flight to be operated at flight altitudes at which the atmospheric pressure in personnel

compartments will be less than 700 hPa unless sufficient stored breathing oxygen is carried to supply—

- (a) all crew members and ten per cent of the passengers for any period in excess of thirty minutes that the pressure in compartments occupied by them shall be between 700 hPa and 620 hPa; and
- (b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them shall be less than 620 hPa.

(3) An AOC holder shall not commence a flight to be operated with a pressurised helicopter unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa.

(4) When the helicopter is operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely to a flight altitude at which the atmospheric pressure is equal to 620 hPa within four minutes, there shall be no less than a ten minute supply for the occupants of the passenger compartment.

35. In-flight procedures for heliport operating minima

(1) A flight shall not be continued towards the heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that heliport, or at least one destination alternate heliport, in compliance with the operating minima established in accordance with regulation 17.

(2) An instrument approach shall not be continued below 300 metres or 1 000 feet above the heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the heliport operating minima.

(3) Where, after entering the final approach segment or after descending below 300 m or 1 000 ft above the heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA or DH or MDA or MDH.

(4) A helicopter shall not continue its approach-to-land at any heliport beyond a point at which the limits of the operating minima specified for that heliport would be infringed.

36. Meteorological observations

An AOC holder or operator shall comply with the requirements for making meteorological observations on board helicopter in flight and for recording and reporting them as specified in the Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022, procedures for air navigation systems-air traffic management (PANS – ATM), the appropriate regional supplementary procedures and any other relevant publications issued by the authority.

37. Hazardous flight conditions

Hazardous flight conditions encountered, other than those associated with meteorological conditions, shall be reported to the appropriate aeronautical station as soon as possible, and such reports rendered shall give details pertinent to the safety of other aircraft.

38. Flight crew members at duty stations

(1) All flight crew members required to be on flight deck duty shall be at their stations during take-off and landing.

(2) During en-route phase of a flight, all flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.

(3) All flight crew members shall keep their seat belts fastened.

(4) Where safety harnesses are provided, a flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases.

(5) All flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

39. Use of oxygen

All flight crew members, when engaged in performing duties essential to the safe operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in accordance with regulation 34.

40. Safeguarding of cabin crew and passengers in pressurised helicopter in the event of loss of pressurisation

(1) Cabin crew shall be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurisation and, they shall have such means of protection as to enable them administer first aid to passengers during stabilised flight following the emergency.

(2) Passengers shall be safeguarded by such devices or operational procedures to ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurisation.

41. Instrument flight procedures

(1) One or more instrument approach procedures to serve each final approach and take-off area or heliport utilised for instrument flight operations shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

(2) An AOC holder or operator shall not operate a helicopter in accordance with IFR unless he or she complies with the instrument approach procedures approved by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

42. Helicopter operating procedures for noise abatement

An AOC holder or operator shall ensure that take-off and landing procedures take into account the need to minimise the effect of helicopter noise.

43. In-flight fuel management

(1) An AOC holder or operator shall establish policies and procedures, approved by the authority, to ensure that in-flight fuel checks and fuel management are performed.

(2) The Pilot-In-Command shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to a landing site where a safe landing can be made with the planned final reserve fuel remaining.

(3) The Pilot-In-Command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific landing site, the pilot calculates that any change to the existing clearance to that landing site, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

(4) The Pilot-In-Command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the usable fuel estimated to be available upon landing at the nearest landing site where a safe landing can be made is less than the required final reserve fuel in compliance with regulation 30.

44. Duties of Pilot-In-Command

(1) A Pilot-In-Command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine is started

until the helicopter finally comes to rest at the end of the flight, with the engine or engines shut down and the rotor blades stopped.

(2) The Pilot-In-Command shall ensure that the checklists specified in regulation 15 are complied with in detail.

(3) The Pilot-In-Command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property in accordance with the Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022.

(4) The Pilot-In-Command shall be responsible for reporting all known or suspected defects in the helicopter, to the AOC holder or operator, at the termination of the flight.

(5) The Pilot-In-Command shall be responsible for the journey log book or the general declaration containing the information required under regulation 76.

45. Duties of flight operations officer

(1) A flight operations officer in conjunction with a method of control and supervision of flight operations shall—

- (a) assist the Pilot-In-Command in flight preparation and provide the relevant information;
- (b) assist the Pilot-In-Command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit; and
- (c) furnish the Pilot-In-Command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight.

(2) In the event of an emergency, a flight operations officer shall—

- (a) initiate such procedures as outlined in the operations manual while avoiding taking any action that would conflict with ATC procedures; and
- (b) convey safety-related information to the Pilot-In-Command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

(3) The Pilot-In-Command shall convey relevant information to the flight operations officer or flight dispatcher during the course of flight, particularly in the context of emergency situations.

46. Carry-on baggage

An AOC holder or operator shall ensure that all baggage carried onto a helicopter and taken into the passenger cabin is adequately and securely stowed.

47. Fatigue management

An AOC holder shall comply with the requirements for fatigue management as specified in the Civil Aviation (Fatigue Management) Regulations, 2022.

Helicopter Performance Operating Limitations

48. General requirements for helicopter performance operating limitations

(1) A person shall operate a helicopter in accordance with a code of performance established by the authority in compliance with these Regulations.

(2) In conditions where the safe continuation of flight is not ensured in the event of a critical engine failure, helicopter operations shall be conducted in condition of weather and light and over such routes and diversion that permit a safe forced landing to be executed.

(3) Notwithstanding the provisions of subregulation (2), the State of the Operator may, based on the result of a risk assessment,

allow for variations without a safe forced landing to be included in the code of performance established in accordance with the provisions of subregulation (1).

(4) The risk assessment shall take into consideration at least the following—

- (a) the type and circumstances of the operation;
- (b) the area or terrain over which the operation is being conducted;
- (c) the probability of, and length of exposure to, a critical engine failure and the tolerability of such an event;
- (d) the procedures and systems for monitoring and maintaining the reliability of the engine;
- (e) the training and operational procedures to mitigate the consequences of the critical engine failure; and
- (f) helicopter equipment.

(5) Where the authority permits IMC operations in performance Class 3, such operations shall be conducted in accordance with the provisions of regulation 52.

49. Helicopters for which application for certification was submitted on or after 22nd March 1991

(1) The provisions contained in this regulation are applicable to the helicopters to which the airworthiness standards are applicable.

(2) A level of performance required for helicopters referred to under subregulation (1) for the helicopters shall be consistent with the overall level embodied in this Regulation.

(3) A helicopter shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual.

(4) An AOC holder or operator shall ensure that the general level of safety required by these Regulations is maintained under all expected operating conditions of the helicopter.

(5) A flight shall not be commenced unless the performance information provided in the flight manual indicates that these Regulations can be complied with for the flight to be undertaken.

(6) In applying these Regulations, account shall be taken of all factors that significantly affect the performance of the helicopter including—

- (a) mass;
- (b) operating procedures;
- (c) the pressure-altitude appropriate to the elevation of the operating site;
- (d) temperature; and
- (e) wind and condition of the surface.

(7) The factors specified in subregulation (6) shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, provided in the scheduling of performance data or in accordance with performance requirements of subregulation (1) with which the helicopter is being operated.

50. Mass limitations

(1) The mass of the helicopter at the start of take-off shall not exceed the mass at which the code of performance requirements referred to in regulation 48(1) is complied with, allowing for expected reductions in mass as the flight proceeds and for such fuel jettisoning as is appropriate.

(2) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the helicopter flight manual taking into account the factors specified in regulation 49(6).

(3) In no case shall the estimated mass for the expected time of landing at the destination and at any alternate exceed the maximum landing mass specified in the helicopter flight manual taking into account the factors specified in regulation 49(6).

(4) In no case shall the mass at the start of take-off, or at the expected time of landing at the destination and at any alternate, exceed the relevant maximum mass at which compliance has been demonstrated in compliance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 unless otherwise authorised in exceptional circumstances for a certain operating site where there is no noise disturbance problem, by the competent authority of the State in which the operating site is situated.

51. Take-off and initial climb phase

(1) In the case of performance of operations in Class 1, a helicopter shall, in the event of the failure of the critical engine being recognised at or before the take-off decision point—

- (a) discontinue the take-off and stop within the rejected take-off area available; or
- (b) continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with regulation 52.

(2) In the case of performance of operations in Class 2, a helicopter shall in the event of the failure of the critical engine at any time after reaching decision point before take-off (DPATO), continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with regulation 52.

(3) Where the failure of the critical engine happens before the DPATO, the helicopter may carry out a forced landing, taking into account the conditions under regulation 49(2).

(4) In the case of performance of operations in Class 3, where at any point of the flight path, failure of an engine shall cause the helicopter to force-land taking into account the conditions under regulation 49(2).

52. En-route phase

(1) In the case of performance of operations in Classes 1 and 2, a helicopter shall in the event of the failure of the critical engine at any point in the en-route phase, continue the flight to a site at which the conditions under regulation 53(1) for operations in performance Class 1, or the conditions under regulation 53(3) for operations in performance Class 2 can be met, without flying below the appropriate minimum flight altitude at any point.

(2) Where the en-route phase is conducted over a hostile environment and the diversion time to an alternate exceeds two hours, the operator shall assess the risks associated with a second engine failure.

(3) In the case of performance of operations in Class 3, a helicopter shall with all engines operating, continue along its intended route or planned diversions without flying at any point below the appropriate minimum flight altitude.

(4) At any point of the flight path, failure of an engine will cause the helicopter to force-land therefore the conditions stated in regulation 48 shall apply.

53. Approach and landing phase

(1) In the case of performance of operations in Class 1, where failure of the critical engine being recognised at any point during the approach and landing phase, before the landing decision point, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path, to land and stop within the landing distance available or to perform a bailed landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified under regulation 50(1).

(2) Where the failure occurring after the landing decision point, the helicopter shall to land and stop within the landing distance available.

(3) In the case of performance of operations in Class 2, where there is critical engine failure before the DPBL, a helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path, either to land and stop within the landing distance available or to perform a bailed landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified under regulation 50(2).

(4) Where there is failure of an engine after the DPBL, a pilot may cause the helicopter to force-land, taking into consideration conditions under regulation 48(2).

(5) In the case of performance of operations in Class 3 where at any point of the flight path, failure of an engine occurs, the pilot shall carry out a forced landing taking into consideration conditions under regulation 48 (2).

54. Obstacle data

The AOC holder or operator shall use available obstacle data to develop procedures to comply with the take-off, initial climb, approach and landing phases detailed in the code of performance specified under regulation 48(1).

55. Additional requirements for operations of helicopters in performance of operations in Class 3 in IMC, except special VFR flights

(1) A pilot while performing operations in Class 3 in Instrument Meteorological Condition shall conduct the operation only over a surface environment acceptable to the competent authority of the State over which the operations are performed.

(2) An AOC holder shall not be approved for helicopter operations in performance of operations in Class 3 in IMC, unless the helicopter is certificated for flight under Instrument Flight Rules (IFR) and the requirements for overall level of safety provided for in these Regulations and the applicable Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 are complied with as follows—

- (a) the reliability of the engines;
- (b) the operator's maintenance procedures, operating practices and crew training programmes; and
- (c) equipment and other requirements prescribed under Schedule 2 to these Regulations.

(3) The AOC holder or operator operating a helicopter operation in performance of operations in Class 3 in IMC shall have a programme for engine trend monitoring and utilise the engine and helicopter manufacturers' recommended instruments, systems and operational or maintenance procedures to monitor the engines.

(4) The AOC holder or operator, operating a helicopter in IMC in performance of operations in Class 3 shall utilise vibration health monitoring for the tail-rotor drive system to minimise the occurrence of mechanical failures.

Helicopter continuing airworthiness

56. An AOC holder's or operator's continuing airworthiness responsibilities

(1) An AOC holder or operator shall ensure that in accordance with the procedures acceptable to the authority—

- (a) each helicopter operated is maintained in an airworthy condition;
- (b) the operational and emergency equipment necessary for the intended flight is serviceable; and
- (c) the certificate of airworthiness of the helicopter operated remains valid.

(2) The AOC holder or operator shall not operate a helicopter unless maintenance on the helicopter, including any associated engine, rotor and part, is carried out by—

- (a) an organisation complying with the requirements of the Civil Aviation (Approved Maintenance Organisation) Regulations, 2022 that is either approved by the authority or is approved by another contracting State and is acceptable by the authority;
- (b) a qualified person or organisation in accordance with procedures that are authorised by the authority; and
- (c) there is a maintenance release in relation to the maintenance carried out.

(3) The AOC holder or operator shall employ a qualified person or group of persons to ensure that all maintenance is carried out in accordance with the maintenance control manual.

(4) The AOC holder or operator shall ensure that the maintenance of its helicopters is performed in accordance with the maintenance programme approved by the authority.

57. Maintenance control manual

(1) An AOC holder or operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance control manual, approved by the authority in accordance with the requirements prescribed under regulation 74, and the design of the manual shall observe human factors principles.

(2) The AOC holder or operator shall ensure that the maintenance control manual is amended as necessary to keep the information contained therein up to date.

(3) Copies of all amendments to the operator's maintenance control manual shall be furnished promptly to all organisations or persons to whom the manual has been issued.

(4) The AOC holder or operator shall provide the State of the Operator and the State of Registry with a copy of the operator's maintenance control manual, together with all amendments or revisions to it and shall incorporate in it such mandatory material as the State of Operator or the State of Registry may require.

58. Maintenance programme

(1) An AOC holder or operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, approved by the authority.

(2) An AOC holder or operator shall develop a maintenance programme for each helicopter that contains the following information—

- (a) maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilisation of the helicopter;
- (b) where applicable, a continuing structural integrity programme;
- (c) procedures for changing or deviating from paragraphs (a) and (b); and
- (d) where applicable, condition monitoring and reliability programme descriptions for helicopter systems, components, power transmissions, rotors and engines.

(3) Subject to subregulation (1), maintenance tasks and intervals that have been specified as mandatory in approval of the type design shall be identified as such by the AOC holder or operator.

(4) The maintenance programme shall be based on maintenance programme information made available by the State of Design or by the organisation responsible for the type design, and any additional applicable experience.

(5) The AOC holder or operator shall ensure that the design and application of the operator's maintenance programme observes human factors principles.

(6) Copies of all amendments to the maintenance programme shall be furnished promptly to all organisations or persons to whom the maintenance programme has been issued.

59. Continuing airworthiness records

(1) An AOC holder or operator shall ensure that the following records are kept for the periods specified in this regulation—

- (a) the total time in service, hours, calendar time and cycles, as appropriate of the helicopter and all life-limited components;
- (b) the current status of compliance with all mandatory continuing airworthiness information;
- (c) appropriate details of modifications and repairs to the helicopter and its major components;
- (d) the time in service hours, calendar time and cycles, as appropriate since last overhaul of the helicopter or its components subject to a mandatory overhaul life;
- (e) the current status of the helicopter's compliance with the maintenance programme; and
- (f) the detailed maintenance records to show that all requirements for a maintenance release have been met.

(2) The records under this regulation shall be kept for a minimum period of ninety days after the unit to which they refer has been permanently withdrawn from service, and the records in subregulation (1)(f) for a minimum period of two years after the signing of the maintenance release.

(3) In the event of a temporary change of the AOC holder or operator, the records shall be made available to the new operator, and in the event of any permanent change of operator, the records shall be transferred to the new operator.

(4) The records kept and transferred in accordance with this Regulation shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

(5) Subject to subregulation (4), the form and format of the records may include paper records, film records, electronic records or any combination.

60. Continuing airworthiness information

(1) An AOC holder or operator operating a helicopter over 3175 kilograms maximum mass shall monitor and assess maintenance and operational experience with respect to continuing airworthiness and provide the information as prescribed by the State of Registry and report through the system specified in the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) An AOC holder or operator operating a helicopter over 3,175 kilograms maximum mass shall obtain and assess continuing airworthiness information and recommendations available from the organisation responsible for the type design and shall implement resulting actions considered necessary in accordance with a procedure acceptable to the State of Registry.

61. Modifications and repairs

(1) An AOC holder or operator shall ensure that all modifications and repairs comply with airworthiness requirements acceptable to the authority.

(2) An AOC holder or operator shall establish procedures to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

62. Maintenance release

(1) Where an approved maintenance organisation carries out maintenance work on a helicopter, the approved maintenance organisation shall issue a maintenance release in accordance with the provisions of the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) Where an organisation that is not an approved maintenance organisation carries out the maintenance work on a helicopter, a maintenance release shall be completed by a person appropriately licensed in accordance with Civil Aviation (Personnel Licensing) Regulations, 2022 and shall certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures approved by the authority.

(3) Where an organisation that is not an approved maintenance organisation carries out the maintenance work, the maintenance release under subregulation (2) shall include the following—

- (a) the basic details of the maintenance work performed;
- (b) the date the maintenance work was completed; and
- (c) the identity of the authorised person or persons signing the release.

63. Records

- (1) An AOC holder or operator shall ensure that the following records are kept—
 - (a) in respect of the entire helicopter, the total time in service;
 - (b) in respect of the major components of the helicopter—
 - (i) the total time in service;
 - (ii) the date of the last overhaul; and
 - (iii) the date of the last inspection;
 - (c) in respect of those instruments and equipment, the serviceability and operating life of which are determined by their time in service—
 - (i) such records of the time in service as are necessary to determine their serviceability or to compute their operating life; and

(ii) the date of the last inspection.

(2) The records specified in subregulation (1) shall be kept for a period of ninety days after the end of the operating life of the unit to which they refer.

Helicopter Flight Crew

64. Composition of flight crew

(1) An AOC holder or operator shall not operate a helicopter unless the number and composition of the flight crew is not less than that specified in the operations manual.

(2) The flight crews shall include flight crew members in addition to the minimum numbers specified in the flight manual or other documents associated with the certificate of airworthiness, when necessitated by considerations related to the type of helicopter used, the type of operation involved and the duration of flight between points where flight crews are changed.

(3) The flight crew shall include at least one member authorised by the State of Registry to operate the type of radio transmitting equipment to be used.

65. Flight crew member emergency duties

(1) An AOC holder or operator shall, for each type of helicopter, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation.

(2) In accomplishing the functions specified under subregulation (1), annual training shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the helicopter.

66. Flight crew member training programmes

(1) An AOC holder or operator shall establish and maintain a ground and flight training programme, approved by the authority, which ensures that all flight crew members are adequately trained to perform their assigned duties.

(2) The training programme referred to in subregulation (1) shall—

- (a) include ground and flight training facilities and properly qualified instructors as determined by the authority;
- (b) consist of ground and flight training for the type of helicopter on which the flight crew member serves;
- (c) include proper flight crew coordination and training for all types of emergency and abnormal situations or procedures caused by engine, transmission, rotor, airframe or systems malfunctions, fire or other abnormalities;
- (d) include training in knowledge and skills related to the visual and instrument flight procedures for the intended area of operation, human performance and threat error and management, the transport of dangerous goods and, where applicable, procedures specific to the environment in which the helicopter is to be operated;
- (e) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures;
- (f) include training in knowledge and skills related to the operational use of head-up display or enhanced vision systems for those helicopters so equipped;
- (g) be undertaken on a recurrent basis, as determined by the authority, and shall include an assessment of competence; and

(h) include route qualification, flight preparation, concept of operations with offshore alternates and criteria for their use.

(3) The requirement for recurrent flight training in a particular type of helicopter shall be considered fulfilled by—

(a) the use, to the extent deemed feasible by the authority, of flight simulation training devices approved by the authority for that purpose; or

(b) the completion within the appropriate period of the proficiency check required under regulation 70 in that type of helicopter.

67. General qualifications

An AOC holder or operator in compliance with the requirements prescribed under the Civil Aviation (Personnel Licensing) Regulations, 2022 shall assign a Pilot-In-Command or a co-pilot to operate at the flight controls of a type or variant of a type of a helicopter during the flight.

68. Recent experience for Pilot-In-Command and co-pilot

(1) An AOC holder or operator shall not assign a Pilot-In-Command or a co-pilot to operate at the flight controls of a type or variant of a type of a helicopter during take-off and landing unless that pilot has operated the flight controls during at least three take-offs and landings within the preceding ninety days on the same type of helicopter or in a flight simulator approved for the purpose.

(2) Where a Pilot-In-Command or a co-pilot is flying several variants of the same type of helicopter or different types of helicopter with similar characteristics in terms of operating procedures, systems and handling, the authority shall decide under which conditions the requirements of subregulation (1) for each variant or each type of helicopter can be combined.

69. Pilot-In-Command operational qualifications

(1) An AOC holder or operator shall not utilise a pilot as Pilot-In-Command of a helicopter on an operation for which that pilot is not currently qualified until such pilot has complied with this regulation.

(2) A pilot referred to in subregulation (1) shall demonstrate to the operator an adequate knowledge of—

- (a) the operation to be flown, including knowledge of—
 - (i) the terrain and minimum safe altitudes;
 - (ii) the seasonal meteorological conditions;
 - (iii) the meteorological, communication and air traffic facilities, services and procedures;
 - (iv) the search and rescue procedures; and
 - (v) the navigation facilities and procedures associated with the route or area in which the flight is to take place;
- (b) procedures applicable to flight paths over heavily populated areas and areas of high air traffic density, obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, and applicable operating minima; and
- (c) the portion of the demonstration relating to arrival, departure, holding and instrument approach procedures may be accomplished in an appropriate training device which is adequate for this purpose.

(3) A Pilot-In-Command shall have made a flight, representative of the operation with which the pilot is to be engaged which must include a landing at a representative heliport, as a member of the flight crew and accompanied by a pilot who is qualified for the operation.

(4) The AOC holder or operator shall maintain a record, sufficient to satisfy the authority of the qualification of the pilot and of the manner in which such qualification has been achieved.

(5) The AOC holder or operator shall not continue to utilise a pilot as a Pilot-In-Command on an operation in an area specified by the operator and approved by the authority unless, within the preceding twelve months, the pilot has made at least one representative flight as a pilot member of the flight crew, or as a check pilot, or as an observer on the flight deck.

(6) In the event that more than twelve months elapse in which a pilot has not made such a representative flight, prior to again serving as a Pilot-In-Command on that operation, that pilot shall requalify in accordance with subregulation (2) and (3).

70. Pilot proficiency checks

(1) The AOC holder or operator shall ensure that piloting technique and the ability to execute emergency procedures is checked in such a way as to demonstrate the pilot's competence on each type or variant of a type of helicopter.

(2) Where the operation may be conducted under IFR, the operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or to a representative of the authority.

(3) Pilot proficiency checks shall be performed twice within any period of one year, and two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

(4) Flight simulation training devices approved by the authority may be used for those parts of the checks for which they are specifically approved.

(5) Where the AOC holder or operator schedules flight crew on several variants of the same type of helicopter or different

types of helicopters with similar characteristics in terms of operating procedures, systems and handling, the authority shall determine under which conditions the requirements of this regulation for each variant or each type of helicopter can be combined.

71. Flight crew equipment

A flight crew member assessed as fit to exercise the privileges of a licence, subject to the use of suitable corrective lenses, shall have a spare set of the correcting lenses readily available when exercising those privileges.

Flight operations officer

72. Qualification and training

(1) An AOC holder or operator engaging a flight operations officer or flight dispatcher employed in conjunction with an approved method of control and supervision of flight operations shall be a licensed flight operations officer in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

(2) In accepting proof of qualifications other than the option of holding of a flight operations officer or flight dispatcher licence, in accordance with the approved method of control and supervision of flight operations, as a minimum, such persons shall meet the requirements specified under the Civil Aviation (Personnel Licensing) Regulations, 2022 .

(3) A flight operations officer or flight dispatcher shall not be assigned to duty unless that person has—

- (a) satisfactorily completed the operator-specific training course that addresses all the specific components of its approved method of control and supervision of flight operations as specified in regulation 10;
- (b) made, within the preceding twelve months, at least two qualification flights in a helicopter over any area for which that person is authorised to exercise flight supervision

and the flight shall include landings as many heliports as practicable;

- (c) demonstrated to the operator knowledge of—
 - (i) the contents of the operations manual;
 - (ii) the radio equipment in the helicopters used; and
 - (iii) the navigation equipment in the helicopters used;
- (d) demonstrated to the operator knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorised to exercise flight supervision—
 - (i) the seasonal meteorological conditions and the sources of meteorological information;
 - (ii) the effects of meteorological conditions on radio reception in the helicopters used;
 - (iii) the peculiarities and limitations of each navigation system which is used by the operation; and
 - (iv) the helicopter loading instructions;
- (e) demonstrated to the operator knowledge and skills related to human performance as they apply to dispatch duties; and
- (f) demonstrated to the operator the ability to perform the flight operations or flight dispatcher duties specified in regulation 45.

(4) A flight operations officer assigned to duty shall maintain complete familiarisation with all features of the operations which are pertinent to such duties, including knowledge and skills related to human performance.

(5) A flight operations officer shall not be assigned to duty after twelve consecutive months of absence from such duty, except in accordance with the requirements prescribed under subregulation (3).

Manuals, Logs and Records

73. Flight manual

(1) An AOC holder or operator shall ensure that a flight manual contains the information specified in the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) The flight manual shall be updated by implementing changes made mandatory by the authority.

74. Contents of operator's maintenance control manual

The AOC holder or operator's maintenance control manual, which may be issued in separate parts, shall contain the following information—

- (a) a description of the procedures including, where applicable—
 - (i) a description of the administrative arrangements between the operator and the approved maintenance organisation; and
 - (ii) a description of the maintenance procedures and the procedures for completing and signing a maintenance release when maintenance is based on a system other than that of an approved maintenance organisation;
- (b) names and duties of the qualified person or persons required;
- (c) a reference to the maintenance programme required;
- (d) a description of the methods used for the completion and retention of the operator's maintenance records required;

- (e) a description of the procedures for monitoring, assessing and reporting maintenance and operational experience required;
- (f) a description of the procedures for complying with the service information reporting requirements prescribed under the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022;
- (g) a description of procedures for assessing continuing airworthiness information and implementing any resulting actions, as required.;
- (h) a description of the procedures for implementing action resulting from mandatory continuing airworthiness information;
- (i) a description of establishing and maintaining a system of analysis and continued monitoring of the performance and efficiency of the maintenance programme, in order to correct any deficiency in that programme;
- (j) a description of helicopter types and models to which the manual applies;
- (k) a description of procedures for ensuring that unserviceability affecting airworthiness are recorded and rectified;
- (l) a description of the procedures for advising the authority of significant in-service occurrences;
- (m) a description of procedures to control the leasing of aircraft and related aeronautical products; and
- (n) a description of the maintenance control manual amendment procedures.

75. Journey log book

(1) A helicopter journey log book shall contain the following items and the corresponding roman numerals—

- (a) I — Helicopter nationality and registration;
- (b) II — Date;
- (c) III — Names of crew members;
- (d) IV — Duty assignments of crew members;
- (e) V — Place of departure;
- (f) VI — Place of arrival;
- (g) VII — Time of departure;
- (h) VIII — Time of arrival;
- (i) IX — Hours of flight;
- (j) X — Nature of flight -private, scheduled or non-scheduled;
- (k) XI — Incidents, observations, if any; and
- (l) XII — Signature of person in charge.

(2) Entries in the journey log book shall be made current and in ink or indelible pencil.

(3) A completed journey log books shall be retained to provide a continuous record of the last six months' operations.

76. Records of emergency and survival equipment carried

(1) An AOC holder or operator shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board any of their helicopters engaged in air navigation.

(2) The information specified in subregulation(1) shall include, where applicable—

- (a) the number, colour and type of life rafts and pyrotechnics;
- (b) details of emergency medical supplies; and
- (c) water supplies and the type and frequencies of the emergency portable radio equipment.

77. Flight recorder records

An AOC holder or operator shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and where necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2022.

Cabin Crew

78. Assignment of emergency duties

(1) An AOC holder or operator shall establish, to the satisfaction of the authority, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, which shall not be less than the minimum number established during certification, in order to effect a safe and expeditious evacuation of the helicopter, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation.

(2) The AOC holder or operator shall assign the functions referred to in subregulation (1) for each type of helicopter.

79. Protection of cabin crew during flight

A cabin crew member shall fasten his or her seat belt or, when provided, a safety harness during take-off and landing and whenever the Pilot-In-Command so directs.

80. Cabin crew training

(1) An AOC holder or operator shall establish and maintain a training programme, approved by the authority, to be completed by all persons before being assigned as a cabin crew member.

(2) A cabin crew member shall complete a recurrent training programme annually.

(3) The training programmes specified in subregulation (1) shall ensure that each person is—

- (a) competent to execute those safety duties and functions that the cabin crew member is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation;
- (b) drilled and capable in the use of emergency and life-saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment, first-aid and universal precaution kits, and automated external defibrillators;
- (c) when serving on helicopters operated above 3000 metres or 10 000 feet, knowledgeable as regards the effect of lack of oxygen and, in the case of pressurised helicopters, as regards physiological phenomena accompanying a loss of pressurisation;
- (d) aware of other crew members' assignments and functions in the event of an emergency so far as is necessary for the fulfillment of the cabin crew member's own duties;
- (e) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin; and
- (f) knowledgeable about human performance as related to passenger cabin safety duties including flight crew-cabin crew coordination.

(4) In the event that more than twelve months elapse in which a cabin crew member has been out of flying duties, that cabin crew member shall requalify in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

Security

81. Helicopter search procedure checklist

(1) An AOC holder or operator shall ensure that there is on board a checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage.

(2) The checklist specified in subregulation (1) shall be supported by guidance on the course of action to be taken should a bomb or suspicious object be found.

82. Training programmes

(1) An AOC holder or operator shall establish and maintain a training programme which enables crew members to act in the most appropriate manner to minimise the consequences of acts of unlawful interference.

(2) The AOC holder or operator shall establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

(3) As a minimum, approved security training programme shall include the following elements—

- (a) determination of the seriousness of any occurrence;
- (b) crew communication and coordination;
- (c) appropriate self-defence responses;
- (d) use of non-lethal protective devices assigned to crew members whose use is authorised by the authority;

- (e) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
- (f) live situational training exercises regarding various threat conditions;
- (g) flight crew compartment procedures to protect the helicopter ; and
- (h) helicopter search procedures and guidance on least-risk bomb locations where practicable.

83. Reporting acts of unlawful interference

Following an act of unlawful interference, the Pilot-In-Command shall submit, without delay, a report of such an act to the designated local authority.

PART III—GENERAL AVIATION

General Requirements

84. Compliance with laws, regulations and procedures

(1) The owner or Pilot-In-Command shall comply with the relevant laws, regulations and procedures of the States in which the helicopter is operated.

(2) The owner or Pilot-In-Command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine or engines are started until the helicopter finally comes to rest at the end of the flight, with the engine or engines shut down and the rotor blades stopped.

(3) Where an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the Pilot-In-Command shall notify the appropriate local authority without delay.

(4) When required by the State in which the incident occurs, the Pilot-In-Command shall submit a report on any such violation to the appropriate authority of such State and the Pilot-In-Command shall also submit a copy of it to the authority and such reports shall be submitted within ten days.

(5) The Pilot-In-Command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property.

(6) The owner or operator shall have available on board the helicopter essential information concerning the search and rescue services in the areas over which the helicopter is intended to be flown

(7) An owner or Pilot-In-Command shall not operate a helicopter unless it is equipped with instruments including communication, navigation and surveillance instruments installed in accordance with the Civil Aviation (Instruments and Equipment) Regulations, 2022.

85. Dangerous Goods

An owner or a Pilot-In-Command shall adhere to the provisions for carriage of dangerous goods by air in accordance with the Civil Aviation (Safe Transport of Dangerous Goods by Air) Regulations, 2022.

86. Use of psychoactive substances

A person shall not use psychoactive substances as specified in the Civil Aviation (Personnel Licensing) Regulations, 2022 and Civil Aviation (Rules of the Air) Regulations, 2020.

87. Specific approvals

(1) The owner or pilot-in-command shall not conduct operations for which a specific approval is required unless such approval has been issued by the authority.

(2) When issuing a specific approval for the operational credit, the authority may ensure that—

- (a) the aircraft meets the appropriate airworthiness certification requirements;
- (b) the information necessary to support effective crew tasks for the operation is appropriately available to both pilots where the number of flight crew members specified in the operations manual or other documents associated with the certificate of airworthiness is more than one;
- (c) the operator or owner has carried out a safety risk assessment of the operations supported by the equipment;
- (d) the operator or owner has established and documented normal and abnormal procedures and MEL;
- (e) the operator or owner has established a training programme for the flight crew members and relevant personnel involved in the flight preparation;
- (f) the operator or owner has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and
- (g) the operator has instituted appropriate procedures in respect of continuing airworthiness practices and programmes.

(3) For operations with operational credit with minima above those related to low visibility operations, the authority may establish criteria for the safe operation of the aircraft.

(4) Any specific approvals required to be obtained under subregulation (1) shall follow the layout and shall contain the information specified in Schedule 3 to these Regulations.

Flight Operations

88. Adequacy of operating facilities

(1) An owner or a Pilot-In-Command shall not commence a flight unless it has been ascertained by every reasonable means available that the ground or water facilities available and directly required for such flight and for the safe operation of the helicopter are adequate including communication facilities and navigation aids.

(2) For purpose of this regulation “reasonable means” in subregulation (1) is intended to denote the use, at the point of departure, of information available to the Pilot-In-Command either through official information published by the aeronautical information services or readily obtainable from other sources.

89. Heliport or landing location operating minima

(1) An owner or a Pilot-In-Command shall establish operating minima in accordance with criteria specified by the authority for each heliport or landing location to be used in operations.

(2) When establishing aerodrome operating minima, any conditions that may be prescribed in the list of specific approvals shall be observed.

(3) The minima specified in subregulation (1) shall not be lower than any that may be established by the State of the Aerodrome, except when specifically approved by that State.

(4) The authority shall authorise operational credit or credits for operations with advanced aircraft.

(5) The authority shall issue a specific approval where the operational credit relates to low visibility operations.

(6) Subject to subregulation (4), the operational credit includes—

(a) for the purposes of an approach ban or dispatch considerations, a minimum below the heliport or landing location operating minima;

- (b) reducing or satisfying the visibility requirements; or
- (c) requiring fewer ground facilities as compensated for by airborne capabilities.

(7) The authorisations specified in subregulation (5) shall not affect the classification of the instrument approach procedure.

90. Passenger briefing

(1) An owner or a Pilot-In-Command shall ensure that crew members and passengers are made familiar, by means of an oral briefing or by other means, with the location and the use of—

- (a) seat belts or harnesses where applicable;
- (b) emergency exits;
- (c) life jackets;
- (d) oxygen dispensing equipment; and
- (e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

(2) The Pilot-In-Command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

91. Helicopter airworthiness and safety precaution

An owner or a Pilot-In-Command shall not commence a flight unless he or she is satisfied that—

- (a) the helicopter is airworthy, duly registered and that the appropriate certificates with respect thereto are aboard the helicopter;
- (b) the instruments and equipment installed in the helicopter are appropriate, taking into account the expected flight conditions;
- (c) any necessary maintenance has been performed in accordance with these Regulations;

- (d) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
- (e) any load carried is properly distributed and safely secured; and
- (f) the helicopter operating limitations contained in the flight manual, or its equivalent, will not be exceeded.

92. Weather reports and forecasts

(1) A Pilot-In-Command shall before commencing a flight, be familiar with all available meteorological information appropriate to the intended flight.

(2) Preparation for a flight away from the vicinity of the place of departure, and for every flight under IFR, shall include—

- (a) a study of available current weather reports and forecasts; and
- (b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

93. Limitations imposed by weather conditions for VFR flight

A flight, except one of purely local character in visual meteorological conditions, to be conducted in accordance with VFR shall not be commenced unless current meteorological reports, or a combination of current reports and forecasts, indicate that the meteorological conditions along the route, or that part of the route to be flown under VFR, will, at the appropriate time, be such as to enable compliance with the VFR.

94. Limitations imposed by weather conditions for IFR flight

(1) Where an alternate is required, a flight to be conducted in accordance with IFR shall not be commenced unless the available information indicates that conditions, at the heliport of intended

landing and at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

(2) Where no alternate is required, a flight to be conducted in accordance with IFR to a heliport when no alternate heliport is required shall not be commenced unless available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival, or from the actual time of departure to two hours after the estimated time of arrival, whichever is the shorter period—

- (a) a cloud base of at least 120 metres (400 feet) above the minimum associated with the instrument approach procedure; and
- (b) visibility of at least 1.5 km more than the minimum associated with the procedure.

95. Heliport operating minima

(1) A flight shall not be continued towards the heliport of intended landing unless the latest available meteorological information indicates that conditions at that heliport, or at least one alternate heliport, will, at the estimated time of arrival, be at or above the specified heliport operating minima.

(2) An instrument approach shall not be continued below 300 metres or 1,000 feet above the heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the heliport operating minima.

(3) Where, after entering the final approach segment or after descending below 300 m or 1,000 ft above the heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA, DH, MDA or MDH.

(4) Subject to subregulation (3), a helicopter shall not continue its approach-to-land beyond a point at which the limits of the heliport operating minima are infringed.

96. Flight in icing conditions

A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.

97. Alternate heliports

(1) For a flight to be conducted in accordance with IFR, at least one alternate heliport or landing location shall be specified in the operational flight plan and the ATC flight plan, unless—

- (a) the weather conditions under regulation 92(2) prevail; or
- (b) the heliport or landing location of intended landing is isolated and—
 - (i) no alternate heliport or landing location is available;
 - (ii) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and
 - (iii) a point of no return or PNR is determined in case of an offshore destination.

(2) The suitable offshore alternates may be specified subject to the following—

- (a) the offshore alternates shall be used only after passing a PNR, and prior to a PNR, onshore alternates shall be used;
- (b) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate;
- (c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate;
- (d) to the extent possible, deck availability shall be guaranteed; and
- (e) weather information must be reliable and accurate.

(3) The offshore alternate shall not be used when it is possible to carry enough fuel to have an onshore alternate, and shall not be used in a hostile environment.

98. Fuel and oil requirements

(1) A helicopter shall not commence a flight unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight.

(2) Subject to subregulation (1), reserve fuel and oil shall be carried to provide for contingencies.

(3) In the case of VFR operation, the fuel and oil carried in order to comply with subregulation (1) shall, in the case of VFR operation, be at least the amount to allow the helicopter to—

- (a) fly to the landing site to which the flight is planned;
- (b) have a final reserve fuel to fly thereafter for a period of twenty minutes at best-range speed; and
- (c) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies, as determined by the authority.

(4) In case of IFR operation, the fuel and oil carried in order to comply with subregulation (1) shall, in the case of IFR operations, be at least the amount to allow the helicopter—

- (a) where no alternate is required, in accordance with regulation 91(2), to fly to and execute an approach at the heliport or landing location to which the flight is planned, to have—
 - (i) a final reserve fuel to fly thirty minutes at holding speed at 450 metres or 1 500 feet above the destination heliport or landing location under

standard temperature conditions and approach and land; and

- (ii) an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies;
- (b) where an alternate is required, in terms of regulations 94 (1), to fly to and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned—
- (i) fly to and execute an approach at the alternate specified in the flight plan;
 - (ii) have a final reserve fuel to fly for thirty minutes at holding speed at 450 metres or 1,500 feet above the alternate under standard temperature conditions, and approach and land; and
 - (iii) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies; and
- (c) where no alternate heliport or landing location is available, including the heliport of intended landing is isolated and no alternate is available, to fly to the heliport to which the flight is planned and thereafter for a period as specified by the authority.
- (5) In computing the fuel and oil required in subregulation (1), at least the following shall be considered—
- (a) meteorological conditions forecast;
 - (b) expected air traffic control routings and traffic delays;
 - (c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

- (d) the procedures for loss of pressurisation, where applicable, or failure of one engine while en route; and
- (e) any other conditions that may delay the landing of the helicopter.

(6) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, where applicable, adjustment of the planned operation.

99. In-flight fuel management

(1) A Pilot-In-Command shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to a landing site where a safe landing can be made with the planned final reserve fuel remaining.

(2) The Pilot-In-Command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific landing site, the pilot calculates that any change to the existing clearance to that landing site, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

(3) The Pilot-In-Command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the usable fuel estimated to be available upon landing at the nearest landing site where a safe landing can be made is less than the required final reserve fuel in compliance with regulation 98.

100. Oxygen supply

(1) Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in these Regulations are as follows—

| <i>Absolute pressure</i> | <i>Metres</i> | <i>Feet</i> |
|--------------------------|---------------|-------------|
| 700 hPa | 3,000 | 10,000 |
| 620 hPa | 4,000 | 13,000 |

(2) A flight to be operated at altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply—

- (a) all crew members and ten per cent of the passengers for any period in excess of thirty minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and
- (b) the crew and passengers for any period that the atmospheric pressure in the compartments occupied by them will be less than 620 hPa.

(3) A flight to be operated with a pressurised helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and a proportion of the passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa.

101. Use of oxygen

All flight crew members, when engaged in performing duties essential to the safe operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required under regulation 100.

102. In-flight emergency instruction

In an emergency during flight, a Pilot-In-Command shall ensure that all persons on board are instructed in such emergency action as may be appropriate to the circumstances.

103. Weather reporting by pilots

Where weather conditions are likely to affect the safety of other aircraft are encountered, a Pilot-In-Command, shall as soon as possible make a report to the appropriate authority.

104. Hazardous flight conditions

(1) A Pilot-In-Command shall report hazardous flight conditions encountered, other than those associated with meteorological conditions to the appropriate aeronautical station as soon as possible.

(2) The report referred to in subregulation (1) shall give such details as may be pertinent to the safety of other aircraft.

105. Fitness of flight crew member

A Pilot-In-Command shall be responsible for ensuring that a flight—

- (a) is not commenced when any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of alcohol or drugs; and
- (b) is not continued beyond the nearest suitable heliport where the capacity of a flight crew member to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen.

106. Flight crew members at duty station

(1) A flight crew member required to be on flight deck duty shall be at his or her station during take-off and landing.

(2) A flight crew member during en-route phase of a flight, required to be on flight deck duty, shall remain at his or her station except where his or her absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.

(3) A flight crew member shall keep his or her seat belt fastened when at his or her station.

(4) A flight crew member occupying the seat of the pilot shall keep the safety harness fastened during the take-off and landing phase where safety harnesses are provided.

(5) A flight crew member shall keep his or her safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of his or her duties, in which case the shoulder straps may be unfastened but the seat belt shall remain fastened.

107. Instrument flight procedures

(1) One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State, to serve each final approach and take-off area or heliport utilised for instrument flight operations.

(2) All helicopters operated in accordance with IFR shall comply with the instrument approach procedures approved by the State in which the heliport is located, or by the authority which is responsible for the heliport when located outside the territory of any State.

108. General instruction

A helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.

109. Refuelling with passengers on board or rotors turning

(1) An owner or a pilot-in command shall not refuel a helicopter when passengers are embarking, on board or disembarking or when the rotor is turning unless it is attended by the Pilot-In-Command or other qualified personnel ready to initiate and direct an evacuation by the most practical and expeditious means available.

(2) When refuelling with passengers embarking, on board or disembarking, two-way communications shall be maintained by helicopter inter-communications system or other suitable means between the ground crew supervising the refuelling and the Pilot-In-Command or other qualified personnel required by subregulation (1).

110. Over-water flights

An owner or a pilot-in command shall not operate a helicopter on flights over water in a hostile environment unless it is certificated for ditching and the state of the sea shall be an integral part of ditching information.

Helicopter Performance Operating Limitations

111. Operating limitations

(1) An owner or a Pilot-In-Command shall operate a helicopter—

- (a) in compliance with the terms of its airworthiness certificate or equivalent document;
- (b) within the operating limitations prescribed by the authority; and
- (c) within the mass limitations imposed by compliance with the applicable noise requirements prescribed under the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 unless otherwise authorised, in exceptional circumstances for a certain heliport where there is no noise disturbance problem, by the competent authority of the State in which the heliport is situated.

(2) The placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the authority for visual presentation, shall be displayed in the helicopter.

(3) Where helicopters are operating to or from heliports in a congested hostile environment, the competent authority of the State in which the heliport is situated shall take such precautions as are necessary to control the risk associated with an engine failure.

Helicopter Continuing Airworthiness

112. Owner's continuing airworthiness responsibilities

(1) An owner of a helicopter, or in the case where it is leased, the lessee, shall ensure that—

- (a) the helicopter is maintained in an airworthy condition;
- (b) the operational and emergency equipment necessary for the intended flight is serviceable;
- (c) the certificate of airworthiness of the helicopter remains valid; and
- (d) the maintenance of the helicopter is performed in accordance with a maintenance programme approved by the authority.

(2) The owner or the lessee shall not operate the helicopter unless maintenance on the helicopter, including any associated engine, rotor and part, is carried out—

- (a) by an organisation complying with airworthiness requirements that are either approved by the authority or by another Contracting State ; or
- (b) by a qualified person or organisation in accordance with procedures that are authorised by the authority and there is a maintenance release in relation to the maintenance carried out.

113. Continuing airworthiness records

(1) The owner shall ensure the following records are kept for the periods mentioned in subregulation (2)—

- (a) the total time in service hours, calendar time and cycles, as appropriate of the helicopter;
- (b) the current status of compliance with all mandatory continuing airworthiness information;

- (c) appropriate details of modifications and repairs to the helicopter;
- (d) the time in service since last overhaul of the helicopter or its components subject to a mandatory overhaul life;
- (e) the current status of the helicopter's compliance with the maintenance programme; and
- (f) the detailed maintenance records to show that all requirements for signing of a maintenance release have been met.

(2) The records in subregulation (1)(a) to (e) shall be kept for a minimum period of ninety days after the unit to which they refer has been permanently withdrawn from service, and the records in subregulation (1)(f) for a minimum period of two years after the signing of the maintenance release.

(3) Where a helicopter is leased, the lessee of that helicopter shall comply with the requirements of subregulation (1) and (2), as applicable while the helicopter is leased.

(4) The records kept and transferred in accordance with this regulation shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

(5) Subject to subregulation (4), the form and format of the records may include, for example, paper records, film records, electronic records or any combination.

114. Continuing airworthiness information

The owner of a helicopter over 3,175 kilograms maximum certificated take-off mass, or in the case where it is leased, the lessee, shall, as required by the authority, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness is transmitted in accordance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

115. Modifications and repairs

All modifications and repairs shall comply with airworthiness requirements acceptable to the authority, and the owner shall establish procedures to ensure that the substantiating data supporting compliance in accordance with the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

116. Maintenance release

(1) Where maintenance is carried out by an approved maintenance organisation, the maintenance release shall be issued by the approved maintenance organisation in accordance with the provisions of the Civil Aviation (Approved Maintenance Organisation) Regulations, 2022.

(2) Where maintenance is not carried out by an approved maintenance organisation, the maintenance release shall be completed and signed by a person appropriately licensed in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022 to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures acceptable to the authority.

(3) Where maintenance is not carried out by an approved maintenance organisation, the maintenance release shall include the following—

- (a) basic details of the maintenance carried out;
- (b) the date when such maintenance was completed; and
- (c) the identity of the person or persons signing the release.

Helicopter Flight Crew

117. Qualifications

An owner or a Pilot-In-Command shall ensure that the licences of each flight crew member have been issued or rendered valid by the authority, and are properly rated and of current validity, and shall be satisfied that flight crew members have maintained competence.

118. Composition of flight crew

The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

PART IV— GENERAL

119. Application for exemptions

(1) An owner may apply to the authority for an exemption from any provision of these Regulations.

(2) A request for exemption shall be made in accordance with the requirements of these Regulations and an application for such exemption shall be submitted and processed in a manner prescribed by the authority.

120. Possession of licence, certificate, approval or authorisation

(1) A holder of a licence, certificate, approval or authorisation issued by the authority shall have in his or her physical possession or at the work station when exercising the privileges of that licence, certificate, approval or authorisation.

(2) A crew member of a foreign registered aircraft shall hold a valid licence, certificate or authorisation and have in his or her physical possession or at the work station when exercising the privileges of that licence, certificate, approval or authorisation.

121. Inspection of licences, certificates, approval or authorisation

A person who holds a licence, certificate, approval or authorisation required by these Regulations shall present it for inspection upon a request from the authority or any other person authorised by the authority.

122. Change of address

A holder of a licence, certificate, approval, authorisation, or any other such document issued under these Regulations shall notify the authority of any change in the physical and mailing address.

123. Replacement of documents

A person may apply to the authority in a form and manner determined by the authority in the applicable technical guidance material for replacement of documents issued under these Regulations when such documents are lost or destroyed.

124. Suspension and revocation of approval or authorisation

(1) The authority may, where it considers it to be in public interest, suspend provisionally, pending further investigation, any licence, certificate, approval, authorisation or any such other document issued under these Regulations.

(2) The authority may, upon the completion of an investigation which has shown sufficient ground to the authority's satisfaction and where it considers it to be in public interest, revoke, suspend or vary any licence, certificate, approval, authorisation or any other document issued or granted under these Regulations.

(3) The authority may, where it considers it to be in public interest, prevent any person or aircraft from flying.

(4) A holder or any person having the possession or custody of any licence, certificate, approval, authorisation or any such other documents which have been revoked, suspended or varied under these Regulations shall surrender the licence, certificate, approval, authorisation or such other documents to the authority within fourteen days from the date of revocation, suspension or variation.

(5) The breach of any condition subject to which any licence, certificate, authorisation or any such other document has been granted or issued under these Regulations shall render the document invalid during the continuance of the breach.

125. Use and retention of approval, authorisation, exemption and records

(1) A person shall not—

- (a) use any approval, authorisation, exemption or such other document issued or required under these Regulations which has been forged, altered, revoked, or suspended, or to which that person is not entitled;
- (b) forge or alter any approval, authorisation, exemption or any such other document issued or required by, or under these Regulations;
- (c) lend any approval, authorisation, exemption or any such other document issued or required under these Regulations to any other person; or
- (d) make any false representation for the purpose of procuring for himself or herself or any other person, grant, issue, renewal or variation of the approval, authorisation, exemption or any such other document.

(2) During the period for which it is required under these Regulations to be preserved, a person shall not mutilate, alter, render illegible or destroy any records, or any entry made, required by or under these Regulations to be maintained, or knowingly make, or procure or assist in the making of, any false entry in any such record, or wilfully omit to make a material entry in such record.

(3) All records required to be maintained by or under these Regulations shall be recorded in a permanent and indelible ink.

(4) A person shall not purport to issue any licence, certificate, approval, authorisation or any such other document for the purpose of these Regulations unless he is authorised to do so under these Regulations.

(5) A person shall not issue any approval, authorisation, exemption or any such other document of the kind referred to in these Regulations unless he or she has satisfied himself or herself that all statements in the approval, authorisation any such other document are correct, and that the applicant is qualified to hold that licence, certificate, approval, authorisation or any such other document.

126. Reports of violation

(1) A person who knows of a violation of the Act, any rule, Regulation or order, shall report it to the authority.

(2) The authority shall determine the nature and type of any additional investigation or enforcement action that shall be taken.

127. Enforcement of directions

(1) A person who fails to comply with any direction given to him or her by the authority or by any authorised person under any provision of these Regulations shall be deemed for the purposes of these Regulations to have contravened that provision.

(2) The authority shall take enforcement action on any regulated entity that fails to comply with any provisions of these Regulations.

(3) The inspectors of the authority holding valid delegations shall take necessary actions to preserve safety where an undesirable condition has been detected.

(4) The action referred to in subregulation (2) may include—

(a) in the case of a regulated entity, imposition of operating restrictions until such a time the existing undesirable condition has been resolved; or

(b) in case of a licensed personnel, require that the individual does not exercise the privileges of the licence until such a time that the undesirable condition has been resolved.

(5) In carrying out enforcement actions pursuant to the provisions of subregulation (3), the inspectors of the authority shall invoke the powers with due care and act in good faith in the interest of preserving safety.

128. Aeronautical user fees

(1) The authority shall notify applicants of the fees to be charged in connection with the issue, validation, renewal, extension or variation of any licence, certificate, authorisation or such other document, including the issue of a copy or the undergoing of any examination, test, inspection or investigation or the grant of any permission or approval, required by these Regulations.

(2) Upon an application being made in connection with which any fee is chargeable in accordance with subregulation (1), the applicant shall be required, before the application is considered, to pay the fee so chargeable.

(3) Where, payment of fees has been made and the application is withdrawn by the applicant or otherwise ceases to have effect or is rejected, the authority shall not refund such payment.

129. Application of Regulations to Government and visiting forces

(1) These Regulations shall apply to aircraft, not being military aircraft, belonging to or exclusively employed in the service of the Government, and for the purposes of such application, the department or other authority for the time being responsible for the management of the aircraft shall be deemed to be the operator of the aircraft, and in the case of an aircraft belonging to the Government, to be the owner of the interest of the Government in the aircraft.

(2) Except as otherwise expressly provided, the naval, military and air force authorities and members of any visiting force and property held or used for the purpose of such a force shall be exempt from the provisions of these Regulations to the same extent as if the visiting force formed part of the military force of the State.

130. Extra- territorial application of Regulations

Except where the context otherwise requires, these Regulations shall—

- (a) apply whether by express reference or otherwise, to an aircraft registered in Uganda, apply to that aircraft wherever the aircraft may be;
- (b) apply whether by express reference or otherwise, to aircraft other than an aircraft in paragraph (a), apply to that aircraft when the aircraft is within Uganda;
- (c) prohibit, require or regulate the doing of anything by a person in or by any of the crew of an aircraft registered in Uganda, apply to those persons and crew, wherever they may be; and
- (d) prohibit, require or regulate the doing of anything by a person, in relation to an aircraft registered in Uganda, where that person is a citizen of Uganda, apply to that person wherever he or she may be.

131. Offences and penalties

(1) A person who contravenes any provision of these Regulations may have the licence, certificate, approval, authorisation, exemption or other document issued to that person revoked or suspended by the authority.

(2) Where any provision of these Regulations is contravened in relation to an aircraft, the operator of that aircraft and the Pilot-In-Command, if the operator or the Pilot-In-Command is not the person who contravened the provision shall, without prejudice to the liability of any other person under these Regulations for that contravention, be deemed for the purposes of these Regulations to have contravened that provision unless the operator and the Pilot-In-Command prove that the contravention occurred without their consent or connivance and that they exercised all due diligence to prevent the contravention.

(3) A person who contravenes any provision specified as an “A” provision in Schedule 4 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points for each offence or each flight or to imprisonment for a term not exceeding twelve months or both.

(4) A person who contravenes any provision specified as a “B” provision in Schedule 4 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points for each offence or each flight or to imprisonment for a term not exceeding three years or, both.

(5) A person who contravenes any provision of these Regulations not being a provision referred to in Schedule 4 to these Regulations, commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points and in the case of a second or subsequent conviction for the same offence to a fine not exceeding two hundred currency.

(6) Where it is proved that an act or omission of any person, which would otherwise have been a contravention by that person of a provision of these Regulations, was due to any cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of that provision.

(7) A person who commits a continuous offence, is liable, on conviction, to a fine not exceeding fifty currency points, for each day of the contravention and the continuous contravention shall constitute a separate offence.

(8) In case an aircraft is involved in a contravention of a provision of these Regulations, where the contravention is by the owner or operator of the aircraft, the aircraft shall be subject to a lien in lieu of the penalty.

(9) Any aircraft that is subject to a lien under subregulation (8), may be seized by and placed in the custody of the authority.

(10) The aircraft which is seized by and placed in the custody of the authority, under subregulation (9), shall be released where—

- (a) the fine is paid;
- (b) a bond of an amount the authority may prescribe, is deposited with the authority, conditioned on the payment of the fine; or
- (c) court makes an order to that effect.

PART V—REVOCATION, SAVINGS AND TRANSITIONAL

132. Revocation of S.I. No. 21 of 2020, savings and transitional

(1) The Civil Aviation (Operation of Aircraft) (Helicopter Operations) Regulations, 2020 are revoked.

(2) A licence, certificate, authorisation, exemption or other approval granted by the authority under the Regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of any licence, certificate, authorisation, exemption or other approval under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) Notwithstanding regulation 131, a person granted a licence, certificate, authorisation exemption or other approval, continued under subregulation (2) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have the licence, certificate, authorisation cancelled by the authority.

SCHEDULES

SCHEDULE 1

Regulation 3

CURRENCY POINT

A currency point is equivalent to twenty thousand shillings.

SCHEDULE 2

Regulation 55(2)(c)

ADDITIONAL REQUIREMENTS FOR OPERATIONS OF HELICOPTERS IN THE PERFORMANCE OF OPERATIONS IN CLASS 3 IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

Airworthiness and operations requirements provided in accordance with Regulation 55, shall satisfy the following:

1. ENGINE RELIABILITY

1.1. Attaining and maintaining approval for engines used by helicopters operating in performance of operations in Class 3 in IMC.

1.1.1. In order to attain initial approval for existing in-service engine types, reliability shall be shown to have a nominal power loss rate of less than 1 per 100 000 engine hours based on a risk management process.

Note. — Power loss in this context is defined as any significant loss of power, the cause of which may be traced to engine or engine component, design, maintenance or installation, including design or installation of the fuel ancillary or engine control systems.

1.1.2. In order to attain initial approval for new engine types, the State of Design shall assess engine models for acceptance for operations in performance of operations in Class 3 in IMC on a case-by-case basis.

1.1.3. In order to maintain approval, the State of Design shall, through the continuing airworthiness process, ensure that engine reliability remains consistent with the intent of the standards contained in paragraph 1.1.1.

1.2. The operator shall be responsible for a programme for ongoing engine trend monitoring.

1.3. To minimise the probability of in-flight engine failure, the engine shall be equipped with—

- (a) for turbine engines: a re-ignition system that activates automatically or a manually selectable continuous ignition system unless the engine certification has determined that such a system is not required, taking into consideration the likely environmental conditions in which the engine is to be operated;
- (b) a magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and
- (c) a means that would permit continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

2. SYSTEMS AND EQUIPMENT

2.1. Helicopters operating in performance of operations in Class 3 in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight or to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions—

- (a) either two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required in IMC; or a primary electrical source and a standby battery or other alternate source of electric power that is capable of supplying 150 per cent of electrical loads of all required instruments and equipment necessary for safe emergency operations of the helicopter for at least one hour; and
- (b) an emergency electrical supply system of sufficient capacity and endurance, following loss of all normally generated power to, as a minimum—

Note.— If a battery is used to satisfy the requirement for a second power source (see 2.a) above), an additional electrical power supply may not be required.

- (i) maintain the operation of all essential flight instruments, communication and navigation systems during a descent from the maximum certificated altitude in an auto rotational configuration to the completion of a landing;
 - (ii) maintain the operation of the stabilisation system, where applicable;
 - (iii) lower the landing gear, if applicable;
 - (iv) where required, provide power to one pitot heater, which must serve an airspeed indicator clearly visible to the pilot;
 - (v) provide for the operation of the landing light;
 - (vi) provide for one engine restart, if applicable; and
 - (vii) provide for the operation of the radio altimeter;
- (c) a radio altimeter;
- (d) an autopilot if intended as a substitute for a second pilot. In these cases, the authority shall ensure the operator's approval clearly states any conditions or limitations on its use;
- (e) a means to provide for at least one attempt at engine re-start;
- (f) an area navigation system approved for use in IFR, capable of being used to locate suitable landing areas in the event of an emergency;
- (g) a landing light that is independent of retractable landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and
- (h) an engine fire warning system.

3. MINIMUM SERVICEABILITY REQUIREMENTS — OPERATING EQUIPMENT

The authority shall specify the minimum serviceability requirements in accordance with Civil Aviation (Aircraft Instruments and Equipment) and (Airworthiness of Aircraft) Regulations 2022 for operating equipment in helicopters operating in performance of operations in Class 3 in IMC.

4. OPERATIONS MANUAL INFORMATION

The operations manual shall include limitations, procedures, approval status and other information relevant to operations in performance of operations in Class 3 in IMC, in accordance with Civil Aviation (Air Operator Certification and Administration) Regulations 2022.

5. EVENT REPORTING

- 5.1. The operator approved to conduct operations by helicopters in performance of operations in Class 3 in IMC shall report all significant failures, malfunctions or defects to the authority who in turn shall notify the State of Design in accordance with Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 and Civil Aviation (Safety Management) Regulations, 2022.
- 5.2. The Authority shall monitor operations in performance of operations in Class 3 in IMC so as to be able to take any actions necessary to ensure that the intended safety level is maintained. The authority shall notify major events or trends of particular concern to the appropriate type certificate holder and the State of Design.

6. OPERATOR PLANNING

- 6.1. Operator route planning shall take account of all relevant information in the assessment of intended routes or areas of operations, including the following—
 - (a) the nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;
 - (b) weather information, including seasonal and other adverse meteorological influences that may affect the flight; and
 - (c) other criteria and limitations as specified by the authority.

7. FLIGHT CREW EXPERIENCE, TRAINING AND CHECKING

- 7.1. The authority shall prescribe the minimum flight crew experience for helicopters operating in performance of operations in Class 3 in IMC.
- 7.2. The operator's flight crew training and checking programme shall be appropriate to operations in performance of operations in Class

3 in IMC, covering normal, abnormal and emergency procedures and, in particular, detection of engine failure including descent to a forced landing in IMC and, for single engine helicopters, entry into a stabilised autorotation.

8. OPERATOR CERTIFICATION OR VALIDATION

The operator shall demonstrate the ability to conduct operations in performance of operations in Class 3 in IMC through a certification and approval process specified by the authority.

SCHEDULE 3

GENERAL AVIATION SPECIFIC APPROVALS


Regulation 87(4)

1. PURPOSE AND SCOPE

- 1.1 Specific approvals shall have a standardised format which contains the minimum information required in the specific approval template.

Note.— When the operations to be conducted require a specific approval, a copy of the document(s) needs to be carried on board.

2. SPECIFIC APPROVAL TEMPLATE

| |
|---|
|  Certificate Serial No..... |
| SPECIFIC APPROVAL |
| UGANDA CIVIL AVIATION AUTHORITY and CONTACT DETAILS¹ |
| Issuing Authority ¹ _____ |
| Address _____ |
| Signature: _____ Date ² : _____ |
| Telephone: _____ Fax: _____ Email: _____ |
| OWNER/OPERATOR |
| Name ³ : _____ Address: _____ Telephone: _____ |
| Fax: _____ Email: _____ |
| Aircraft model ⁴ and registration marks: |

| SPECIFIC APPROVAL | YES | NO | DESCRIPTION ⁵ | RE-MARKS |
|--|--------------------------|--------------------------|------------------------------------|----------|
| Low visibility | | | | |
| Approach and landing | <input type="checkbox"/> | <input type="checkbox"/> | CAT ⁶ -__RVR: m DH: _ft | |
| Take off | <input type="checkbox"/> | <input type="checkbox"/> | RVR ⁷ : __m | |
| Operational credit(s) | <input type="checkbox"/> | <input type="checkbox"/> | ⁸ | |
| RVSM | <input type="checkbox"/> | <input type="checkbox"/> | | |
| AR navigation specifications for PBN operations ⁹ | <input type="checkbox"/> | <input type="checkbox"/> | | |
| EFB | <input type="checkbox"/> | <input type="checkbox"/> | ¹⁰ | |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | ¹¹ | |

Notes:

1. Civil Aviation Authority name and contact details, including the telephone country code and email if available.
2. Issuance date of the specific approval (dd-mm-yyyy) and signature of the authority representative.
3. Owner or operator's name and address.
4. Insert the aeroplane make, model and series, or master series, if a series has been designated. The CAST/ICAO taxonomy is available at: <http://www.intlaviationstandards.org/>.
5. List in this column the most permissive criteria for each specific approval (with appropriate criteria).
6. Insert the applicable precision approach category CAT II or III. Insert the minimum RVR in metres and decision height in feet. One line is used per listed approach category.
7. Insert the approved minimum take-off RVR in metres, or the equivalent horizontal visibility if RVR is not used. One line per approval may be used if different approvals are granted.
8. List the airborne capabilities (i.e. automatic landing, HUD, EVS, SVS, CVS) and associated operational credit(s) granted.

9. Performance-based navigation (PBN): one line is used for each PBN AR navigation specification approval (e.g. RNP AR APCH), with appropriate limitations listed in the “Description” column.
10. List the EFB functions used for the safe operation of helicopters and any applicable limitations.
11. Other specific approvals or data can be entered here, using one line (or one multi-line block) per approval (e.g. specific approach operations approval)

SCHEDULE 4

Regulation 131 (3), (4), (5)

OFFENCES AND PENALTIES BY CATEGORY

| REGULATION | TITLE | CATEGORY OF OFFENCE |
|------------|--|---------------------|
| 5 | Compliance with laws, regulations and procedures | B |
| 6 | Compliance by a foreign operator with laws regulations and procedures of the Authority | A |
| 7 | Safety management | A |
| 8 | Dangerous goods | A |
| 9 | Use of psychoactive substances | A |
| 10 | Operating facilities | A |
| 11 | Surveillance of operations by a foreign operator | A |
| 12 | Operations manual | A |
| 13 | General operating instructions | B |
| 14 | In-flight simulations of emergency situations | A |
| 15 | Checklists | B |
| 16 | Minimum flight altitudes for operations under IFR | A |
| 17 | Heliport or landing location operating minima | A |
| 18 | Fuel and oil records | B |
| 19 | Pilot-In-Command | B |
| 20 | Passengers | B |
| 21 | Over-water flights | B |
| 22 | Flight preparation | A |

| | | |
|----|---|---|
| 23 | Operational flight planning | A |
| 24 | Destination alternate heliport | B |
| 25 | Meteorological conditions for VFR | A |
| 27 | Meteorological conditions for IFR | A |
| 28 | Visibility | A |
| 29 | Icing Conditions | A |
| 30 | Fuel and oil requirements | A |
| 31 | Fuel and oil requirements for VFR Operations | A |
| 32 | Fuel and oil requirements for IFR Operations | B |
| 33 | Refuelling with passengers on board or rotors turning | B |
| 34 | Oxygen supply | A |
| 35 | Instrument flight procedures for heliport operating minima | A |
| 36 | Meteorological observations | A |
| 37 | Hazardous flight conditions | A |
| 38 | Flight crew members at duty stations | B |
| 39 | Use of oxygen | B |
| 40 | Safeguarding of cabin crew and passengers in pressurised helicopters in the event of loss of pressurisation | B |
| 41 | Instrument flight procedures | A |
| 42 | Helicopter operating procedures for noise abatement | A |
| 43 | Inflight fuel management | A |
| 44 | Duties of Pilot-In-Command | B |
| 45 | Duties of flight operations officer | A |
| 46 | Carry-on baggage | A |

| | | |
|----|--|---|
| 47 | Fatigue management | A |
| 48 | General | A |
| 49 | Helicopters for which application for certification was submitted on or after 22 March 1991 | A |
| 50 | Mass limitation | A |
| 51 | Take-off and initial climb phase | A |
| 52 | En route phase | A |
| 53 | Approach and landing phase | A |
| 54 | Obstacle data | A |
| 55 | Additional requirements for operations of helicopters in performance of operations in Class 3 in IMC, except | A |
| 56 | An AOC holder's continuing airworthiness responsibilities | A |
| 57 | Operator's maintenance control manual | A |
| 58 | Maintenance Programme | A |
| 59 | Continuing airworthiness records | A |
| 60 | Continuing airworthiness information | A |
| 61 | Modifications and repairs | B |
| 62 | Maintenance release | B |
| 63 | Records | A |
| 64 | Composition of flight crew | B |
| 65 | Flight crew member emergency duties | A |
| 66 | Flight crew member training programmes | B |
| 67 | General Qualifications | B |
| 68 | Recent experience for pilot-in command and co-pilot | A |

| | | |
|----|---|---|
| 69 | Pilot-In-Command operational qualifications | A |
| 70 | Pilot proficiency checks | A |
| 71 | Flight crew equipment | A |
| 72 | Qualification and training | B |
| 73 | Flight manual | B |
| 74 | Contents of operator's maintenance control manual | A |
| 75 | Journey logbook | A |
| 76 | Records of emergency and survival equipment carried | A |
| 77 | Flight recorder records | A |
| 78 | Assignment of emergency duties | A |
| 79 | Protection of cabin crew during flight | A |
| 80 | Cabin crew training | A |
| 81 | Helicopter search procedure checklist | A |
| 82 | Training programmes | A |
| 83 | Reporting acts of unlawful interference | A |
| 84 | Compliance with laws, regulations and procedures | A |
| 85 | Dangerous goods | A |
| 86 | Use of psychoactive substances | A |
| 87 | Specific approvals | A |
| 88 | Adequacy of operating facilities | A |
| 89 | Heliport or landing location operating minima | A |
| 90 | Passenger briefing | A |
| 91 | Helicopter airworthiness and safety precaution | A |
| 92 | Weather reports and forecasts | A |

| | | |
|-----|--|---|
| 93 | Limitations imposed by weather conditions for VFR Flight | A |
| 94 | Limitations imposed by weather conditions for IFR Flight | A |
| 95 | Heliport operating minima | B |
| 96 | Flight in icing conditions | A |
| 97 | Alternate heliports | A |
| 98 | Fuel and Oil Requirements | A |
| 99 | Inflight Fuel Management | A |
| 100 | Oxygen supply | A |
| 101 | Use of oxygen | B |
| 102 | In-flight emergency instruction | B |
| 103 | Weather reporting by pilots | A |
| 104 | Hazardous flight conditions | A |
| 105 | Fitness of flight crew members | A |
| 106 | Flight crew members at duty stations | A |
| 107 | Instrument flight procedures | B |
| 108 | General Instruction | B |
| 109 | Refuelling with passengers on board or rotors turning | B |
| 110 | Over-water flights | A |
| 111 | Operating limitations | A |
| 112 | Owners Continuing Airworthiness responsibilities | A |
| 113 | Continuing Airworthiness records | B |
| 114 | Continuing Airworthiness information | B |
| 115 | Modification and Repairs | B |

| | | |
|-----|--|---|
| 116 | Maintenance release | B |
| 117 | Qualifications | B |
| 118 | Composition of flight crew | A |
| 120 | Possession of the licence, certificate, approval or authorisation | A |
| 121 | Inspection of licences, certificates, approval or authorisation | A |
| 122 | Change of address | A |
| 123 | Replacement of documents | A |
| 124 | Suspension and revocation approval or authorisation | A |
| 125 | Use and retention of approvals, authorisation, exemption and records | A |
| 126 | Reports of violation | A |
| 127 | Enforcement of directives | A |

Cross Reference

Civil Aviation (Air Operator Certification and Administration) Regulations, 2022 S.I. No. 73 of 2022

Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022 S.I. No. 66 of 2022

Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 S.I. No. 77 of 2022

Civil Aviation (Approved Maintenance Organisations) Regulations, 2022 S.I. No. 78 of 2022

Civil Aviation (Fatigue Management) Regulations, 2022 S.I. No. 82 of 2022.

Civil Aviation (Instruments and Equipment) Regulations, 2022 S.I. No. 75 of 2022

Civil Aviation (Meteorological Services for Air Navigation) Regulations, 2022 S.I. No. 83 of 2022

Civil Aviation (Personnel Licensing) Regulations, 2022 S.I. No. 89 of 2022.

Civil Aviation (Rules of Air) Regulations, 2020 S.I. No. 15 of 2020

Civil Aviation (Safe Transport of Dangerous Goods by Air) Regulations, 2022 S.I. No. 90 of 2022

Civil Aviation (Safety Management) Regulations, 2022 S.I. No. 91 of 2022

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Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 86

**THE CIVIL AVIATION (OPERATION OF AIRCRAFT) (GENERAL
AVIATION) (AEROPLANES) REGULATIONS, 2022**

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 86

Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022

(Under sections 34 (2) and 61 of the Civil Aviation Authority Act, Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by sections, 34 (2) and 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Operation of Aircraft) (General Aviation) (Aeroplanes) Regulations, 2022.

2. Application

These Regulations apply to all aeroplanes engaged in general aviation operations and operators of aeroplanes used in general aviation.

3. Interpretation

In these Regulations, unless the context otherwise requires—

“accelerate-stop distance available (ASDA)” means the length of the take-off run available plus the length of stop way, where applicable;

“Act” means the Civil Aviation Authority Act, Cap. 354;

“acts of unlawful interference” means an act or attempted act such as to jeopardise the safety of civil aviation and air transport, and includes—

- (a) unlawful seizure of an aeroplane in flight;
- (b) unlawful seizure of an aeroplane on the ground;

- (c) hostage-taking on board an aeroplane or in aerodromes;
- (d) forcible intrusion on board an aeroplane, at an airport or on the premises of an aeronautical facility;
- (e) introduction on board an aeroplane, ¹ or at an airport, of a weapon or hazardous device or material intended for criminal purposes; or
- (f) communication of false information so as to jeopardise the safety of an aeroplane in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility;

“advisory airspace” means an airspace of defined dimensions or designated route, within which air traffic advisory service is available;

“aerial work” means an aeroplane operation in which an aeroplane is used for specialised services including agriculture, construction, photography, surveying, observation and patrol, search and rescue and aerial advertisement;

“aerodrome” means a defined area on land or water, including any buildings, installations and equipment, used or intended to be used either wholly or in part for the arrival, departure and surface movement of an aeroplane;

“aerodrome operating minima” means the limits of usability of an aerodrome for—

- (a) take-off, expressed in terms of runway visual range and visibility and, if necessary, cloud conditions;
- (b) landing in 2D instrument approach operations, expressed in terms of visibility or runway visual range, minimum descent altitude or height (MDA/H) and, if necessary, cloud conditions; or

- (c) landing in 3D instrument approach operations, expressed in terms of visibility or runway visual range and decision altitude (DA) or decision height (DH) as appropriate to the type or category of the operation;

“aeronautical product” means any aeroplane, an aeroplane engine, propeller, or sub-assembly, appliance, material, part, or component to be installed;

“aeroplane” means a power-driven heavier-than-air aeroplane, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight;

“aeroplane tracking” means a process, established by an operator, that maintains and updates, at standardised intervals, a ground-based record of the four dimensional position of an individual aeroplane in flight;

“aeroplane type” means all aeroplane of the same design;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air, other than the reactions of the air against the earth surface;

“aircraft operating manual” means a manual approved by the authority, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aeroplane systems and other material relevant to the operation of the aeroplane;

“airframe” means the fuselage, booms, nacelles, cowlings, fairings, airfoil surfaces, including rotors but, excludes propellers and rotating airfoils of a power plant and landing gear of an aeroplane and their accessories and controls;

“air operator certificate (AOC)” means a certificate authorising an operator to carry out specified commercial air transport operations;

“air traffic control service” means a service provided for the purpose of—

- (a) preventing collisions between aeroplanes; and on manoeuvring area between aeroplanes and obstructions; and
- (b) expediting and maintaining an orderly flow of air traffic;

“air traffic control (ATC) unit” means variously, an area control centre, approach control unit or aerodrome control tower;

“air traffic service (ATS)” means variously, flight information service, alerting service, air traffic advisory service, air traffic control service, area control service, approach control service or aerodrome control service;

“airworthy” means the status of an aeroplane, engine, propeller or part of the aeroplane when it conforms to its approved design and is in a condition for safe operation;

“alternate aerodrome” means an aerodrome to which an aeroplane may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing including the following—

- (a) take-off alternate which is an alternate aerodrome at which an aeroplane can land should it become necessary shortly after take-off and it is not possible to use the aerodrome of departure;
- (b) en-route alternate which is an alternate aerodrome at which an aeroplane would be able to land after experiencing an abnormal or emergency condition while en-route; or

- (c) destination alternate which is an alternate aerodrome to which an aeroplane may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing;

“altimetry system error (ASE)” means the difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure;

“appliance” means any instrument, mechanism, equipment, part, apparatus, appurtenance, or accessory, including communications equipment, that is used or intended to be used in operating or controlling an aeroplane in flight, is installed in or attached to the aeroplane, and is not part of an airframe, power plant, or propeller;

“approach procedure with vertical guidance (APV)” means a performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A;

“appropriate airworthiness requirements” means the comprehensive and detailed airworthiness codes established, adopted or accepted by a contracting State for the class of aeroplane, engine or propeller under consideration;

“appropriate authority” means—

- (a) in the case of a flight over the high seas, the relevant authority of the State of registry;
- (b) in the case of a flight other than over the high seas, the relevant authority of the State having sovereignty over the territory being overflown;

“area navigation (RNAV)” means a method of navigation which permits aeroplane operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of both;

“automatic deployable flight recorder (ADFR)” means a combination flight recorder installed on an aeroplane which is capable of automatically deploying from the aeroplane;

“authorised instructor” means a person who—

- (a) holds a valid ground instructor licence issued under the Civil Aviation (Personnel Licensing) Regulations, 2022 when conducting ground training;
- (b) holds a current flight instructor rating issued under the Civil Aviation (Personnel Licensing) Regulations, 2022 when conducting ground training or flight training; or
- (c) is authorised by the authority to provide ground training or flight training under the Civil Aviation (Personnel Licensing) Regulations, 2022 and the Civil Aviation (Approved Training Organisations) Regulations, 2022;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;

“cabin crew member” means a crew member who performs, in the interest of the safety of passengers, duties assigned by the operator or the PIC of the aeroplane, but who shall not act as a flight crew member;

“Category II (CAT II) operations” means a precision instrument approach and landing with a decision height lower than 60

metres (200 feet), but not lower than 30 metres (100 feet), and a runway visual range not less than 350 metres;

“Category IIIA (CAT IIIA) operations” means a precision instrument approach and landing with—

- (a) a decision height lower than 30 metres (100 feet) or no decision height; and
- (b) a runway visual range not less than 200 metres;

“Category IIIB (CAT IIIB) operations” means a precision instrument approach and landing with—

- (a) a decision height lower than 15 metres (50 feet) or no decision height; and
- (b) a runway visual range less than 200 metres but not less than 50 metres;

“Category IIIC (CAT IIIC) operations” means a precision instrument approach and landing with no decision height and no runway visual range limitations;

“check pilot” means a pilot approved by the authority who has the appropriate training, experience, and demonstrated ability to evaluate and certify the knowledge and skills of other pilots;

“commercial air transport operation” means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or higher;

“commercial material (COMAT)” means operator material carried on an operator’s aeroplane for the operator’s own purposes;

“continuing airworthiness” means the set of processes by which an aeroplane, engine, propeller or part complies with the

applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life;

“continuing airworthiness records” means records which are related to the continuing airworthiness status of an aeroplane, engine, propeller or associated part;

“co-pilot” means a licensed pilot serving in any piloting capacity other than as a PIC but excluding a pilot who is on board the aeroplane for the sole purpose of receiving flight instruction;

“corporate aviation operation” means the non-commercial operation or use of an aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business flown by a professional pilot employed to fly the aircraft;

“crew member” means a person assigned by an operator to duty on an aeroplane during a flight duty period;

“critical engine” means the engine whose failure would most adversely affect the performance or handling qualities of an aeroplane;

“critical phases of flight” means those portions of operations involving taxiing, take-off and landing, and all flight operations below 10,000 feet, except cruise flight;

“cruising level” means a level maintained during a significant portion of a flight;

“currency point” has the value assigned to in Schedule 1 to these Regulations;

“dangerous goods” means articles or substances which are capable of posing a risk to health, safety, property or the

environment and which are shown in the list of dangerous goods in the technical instructions or which are classified according to technical instructions;

“decision altitude (DA)” means a specified altitude in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established;

“decision height (DH)” means a specified height in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established;

“duty” means any task that a flight or cabin crew member is required by the operator to perform, including flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue;

“duty period” means a period which starts when a flight or cabin crew member is required by an operator to report for or to commence a duty and ends when that person is free from all duties;

“electronic flight bag (EFB)” means an electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties;

“emergency locator transmitter (ELT)” means equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated and an ELT may be any of the following—

- (a) automatic fixed ELT (ELT(AF)) which is an automatically activated ELT that is permanently attached to an aeroplane;
- (b) automatic portable ELT (ELT(AP)) which is an automatically activated ELT that is rigidly attached to an aeroplane but readily removable from the aeroplane;
- (c) automatic deployable ELT (ELT(AD)) which is an ELT that is rigidly attached to an aeroplane and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors or manual deployment; or
- (d) survival ELT (ELT(S)) which is an ELT that is removable from an aeroplane, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors;

“engine” means a unit used or intended to be used for aeroplane propulsion and consists of at least those components and equipment necessary for functioning and control, but excludes the propeller or motors, where applicable;

“enhanced vision system (EVS)” means a system that displays electronic real-time images of the external scene achieved through the use of image sensors;

“estimated time of arrival” means for —

- (a) instrument flight rules (IFR) flights, the time at which it is estimated that the aeroplane will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aeroplane will arrive over the aerodrome; or

- (b) visual flight rules (VFR) flights, the time at which it is estimated that the aeroplane will arrive over the aerodrome;

“Extended Diversion Time Operations (EDTO)” means any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the authority;

“Extended Diversion Time Operations (EDTO) critical fuel” means the fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure;

“Extended Diversion Time Operations (EDTO) significant system” means an aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion;

“fatigue” means a physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness or physical activity that can impair a crew member’s alertness and ability to safely operate an aeroplane or perform safety related duties;

“final approach segment” means that segment of an instrument approach procedure in which alignments and descents for landing are accomplished;

“flight crew member” means a licensed crew member charged with duties essential to the operation of an aeroplane during flight time;

“flight duty period” means a period which commences when a flight or cabin crew member is required to report for

duty that includes a flight or a series of flights and which finishes when the aeroplane finally comes to rest and the engines are shut down at the end of the last flight on which he or she is a crew member;

“flight manual” means a manual, associate with the certificate of airworthiness, containing limitations within which the aeroplane is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aeroplane;

“flight operations officer” means a person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, and is suitably qualified in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022, and supports, briefs or assists the PIC in the safe conduct of the flight;

“flight plan” means specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aeroplane;

“flight recorder” means any type of recorder installed in the aircraft for the purpose of complimenting accidents or incidents investigation;

“flight time” means—

- (a) for aeroplanes and gliders, the total time from the moment an aeroplane or a glider moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight and it is synonymous with the term “block to block” or “chock to chock” time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight;

- (b) for helicopters, the total time from the moment a helicopter rotor blades start turning until the moment a helicopter comes to rest at the end of the flight and the rotor blades are stopped; or
- (c) for airships or free balloons, the total time from the moment an airship or free balloon first becomes detached from the surface until the moment when it next becomes attached thereto or comes to rest;

“general aviation operation” means an aeroplane operation other than a commercial air transport operation or an aerial work operation;

“head-up display (HUD)” means a display system that presents flight information into the pilot’s forward external field of view;

“heavier-than-air aeroplane” means any aeroplane deriving its lift in flight chiefly from aerodynamic forces;

“helicopter” means a heavier-than-air aeroplane supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axis;

“human factors principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

“human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;

“inspection” means the examination of an aeroplane or aeronautical product to establish conformity with a standard approved by the authority;

“instrument approach operations” means an approach and landing using instruments for navigation guidance based on an instrument approach procedure;

“Instrument Approach Procedure (IAP)” means a series of pre-determined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply and instrument approach procedures may be classified as follows—

- (a) Non-Precision Approach (NPA) procedure which is an instrument approach procedure designed for 2D instrument approach operations Type A;
- (b) Approach Procedure with Vertical Guidance (APV) which is a performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A; or
- (c) Precision Approach (PA) procedure which is an instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS CAT I) designed for 3D instrument approach operations Type A or B;

“isolated aerodrome” means a destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type;

“journey logbook” means a form signed by the PIC of each flight that records the aeroplane’s registration, crew member names and duty assignments, the type of flight, and the date, place, and time of arrival and departure;

“maintenance” means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“maintenance programme” means a document which describes the specific scheduled maintenance tasks and the frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aeroplane to which it applies;

“maintenance release” means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements;

“manufacturer” means the contracting State which approved the original type certificate and any subsequent supplemental type certificates for an aeroplane, or which approved the design of an aeroplane, aeroplane component or appliance;

“maximum mass” means maximum certificated take-off mass;

“Minimum Descent Altitude (MDA)” means a specified altitude in a non-precision approach or circling approach below which descent must not be made without the required visual reference;

“Minimum Descent Height (MDH)” means a specified height in a non-precision approach or circling approach below which descent must not be made without the required visual reference;

“Minimum Equipment List (MEL)” means a list approved by the authority which provides for the operation of an aeroplane, subject to specific conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the Master Minimum Equipment List (MMEL) established for a particular aeroplane type;

“modification” means a change to the type design of an aeroplane or aeronautical product which is not a repair;

“night” means the time between fifteen minutes after sunset and fifteen minutes before sunrise, sunrise and sunset being determined at surface level, and includes any time between sunset and sunrise when an unlighted aeroplane or other unlighted prominent object cannot clearly be seen at a distance of 4,572 metres;

“Non-Precision Approach (NPA) procedure” means an instrument approach procedure designed for 2D instrument approach operations Type A;

“operator” means a person, organisation or enterprise engaged in or offering to engage in an aeroplane operation;

“operating base” means the location from which operational control is exercised;

“operational control” means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aeroplane and the regularity and efficiency of the flight;

“operational flight plan” means the operator’s plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations, and relevant expected conditions on the route to be followed and at the aerodromes concerned;

“operations manual” means a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties;

“operator’s maintenance control manual” means a document which describes the operator’s procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator’s aeroplane on time and in a controlled and satisfactory manner;

“overhaul” means the restoration of an aeroplane or aeronautical product using methods, techniques, and practices approved by the authority, including disassembly, cleaning, and inspection as permitted, repair as necessary, and reassembly and tested in accordance with approved standards and technical data, or in accordance with current standards and technical data acceptable to the authority, which have been developed and documented by the manufacturer, holder of the type certificate, supplemental type certificate, or a material, part, process, or appliance approval under parts manufacturing authorisation (PMA) or technical standard order (TSO);

“Pilot-In-Command (PIC)” means the pilot designated by the operator, or the owner, as being in command and charged with the safe conduct of a flight;

“Point of No Return (PNR)” means the last possible geographic point at which an aeroplane can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight;

“power plant” means an engine that is used or intended to be used for propelling aeroplane and includes turbo superchargers, appurtenances, and accessories necessary for its functioning, but does not include propellers;

“practical test” means a competency test on the areas of operations for a licence, certificate, rating, or authorisation that is conducted by having the applicant respond to questions and demonstrate manoeuvres in flight or in an approved synthetic flight trainer;

“Precision Approach (PA) procedure” means an instrument approach procedure based on navigation systems such as Instrument Landing System (ILS), microwave landing system (MLS), ground based augmentation landing system (GLS) and satellite based augmentation system (SBAS) CAT I designed for 3D instrument approach operations Type A or B;

“pressure altitude” means an atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the standard atmosphere;

“propeller” means a device for propelling an aeroplane that has blades on an engine driven shaft and that, when rotated, produces by its action on the air, a thrust approximately perpendicular to its plane of rotation and includes control components normally supplied by its manufacturer, but does not include main and auxiliary rotors or rotating airfoils of engines;

“psychoactive substances” means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents excluding coffee and tobacco;

“rating” means an authorisation entered on or associated with a licence or certificate and forming part of the licence or certificate, stating special conditions, privileges or limitations pertaining to such licence or certificate except as used in engine thrust rating;

“repair” means the restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear;

“runway surface condition” means the state of the surface of a runway, including —

- (a) contaminated runway, which is a runway where more than twenty five per cent of the runway surface area, whether in isolated areas or not, within the required length and width being used is covered by—
 - (i) water or slush more than 3 millimetres (0.125 inches) deep;
 - (ii) loose snow more than 20 millimetres (0.75 inches) deep; or
 - (iii) compacted snow or ice, including wet ice;
- (b) dry runway, which is a runway which is clear of contaminants and visible moisture within the required length and the width being used; or
- (c) wet runway, which is a runway that is neither dry nor contaminated;

“Runway visual range (RVR)” means the range over which the pilot of an aeroplane on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line;

“safety management system” means a systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures;

“safety-sensitive personnel” means persons who might endanger aviation safety if they perform their duties and functions improperly and includes crew members, aeroplane maintenance personnel and air traffic controllers;

“serious injury” means an injury which is sustained by a person in an accident and—

- (a) requires hospitalisation for more than forty-eight hours, commencing within seven days from the date the injury was received;
- (b) results in a fracture of any bone except simple fractures of fingers, toes or nose;
- (c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage;
- (d) involves injury to any internal organ;
- (e) involves second or third-degree burns, or any burns affecting more than five percent of the body surface;
or
- (f) involves verified exposure to infectious substances or injurious radiation;

“small aeroplane” means an aeroplane having a maximum certified take-off mass of 5,700 kg (12,500 lbs) or less;

“State of the aerodrome” means the State in whose territory the aerodrome is located;

“State of Registry” means the State on whose register the aeroplane is entered;

“synthetic flight trainer” means any one of the following three types of apparatus in which flight conditions are simulated on the ground—

- (a) a flight simulator, which provides an accurate representation of the cockpit of a particular aeroplane type to the extent that the mechanical, electrical, electronic, aeroplane systems control functions, the

normal environment of flight crew members and the performance and flight characteristics of that type of aeroplane are realistically simulated;

- (b) a flight procedures trainer, which provides a realistic cockpit environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic aeroplane systems, and the performance and flight characteristics of aeroplane of a particular class; or
- (c) a basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the cockpit environment of an aeroplane in flight in instrument flight conditions;

“technical instructions” means the technical instructions for the safe transport of dangerous goods by air approved and published by decision of the Council of the International Civil Aviation Organisation;

“threshold time” means the range, expressed in time, established by the authority, to an en-route alternate aerodrome, whereby any time beyond requires an EDTO approval from the authority;

“training program” means a program that consists of courses, courseware, facilities, flight training equipment, and personnel necessary to accomplish a specific training objective and may include a core curriculum and a specialty curriculum;

“Visual Meteorological Conditions (VMC)” means meteorological conditions expressed in terms of visibility distance from cloud and ceiling, equal to or better than specified minima.

PART II—GENERAL AVIATION OPERATIONS FOR
SMALL AEROPLANES

4. Application of this Part

This Part applies to small aeroplanes.

5. Compliance with laws, regulations and procedures

(1) A PIC of a small aeroplane shall comply with the laws, regulations and procedures of any other State in which the operations are conducted.

(2) A PIC of a small aeroplane shall be familiar with the—

- (a) laws, regulations and procedures pertinent to the performance of his or her duties;
- (b) prescribed areas to be traversed; and
- (c) aerodromes to be used and the air navigation facilities relating to the aerodromes.

(3) A PIC of a small aeroplane shall ensure that members of the flight crew are familiar with the laws, regulations and procedures that are pertinent to the performance of their respective duties in the operation of the aeroplane.

(4) A PIC of a small aeroplane is responsible for the operational control of the aeroplane.

(5) Where an emergency situation which endangers the safety or security of an aeroplane or persons necessitates the taking of action which involves a violation of the local regulations or procedures of a State, the PIC shall notify the appropriate local authority in the State without delay.

(6) Where required by the State in which an emergency situation referred to under subregulation (5) arises, the PIC shall submit a report on any violation—

- (a) to the appropriate authority of the State where a violation of local regulations or procedures has occurred; and
- (b) to the State of Registry of the aeroplane.

(7) The reports referred to in subregulation (6) shall be submitted to the State in which the violation occurs and the State of Registry within ten days from the date of violation of the regulations and procedures.

(8) A PIC of a small aeroplane shall have available on board the aeroplane, the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

(9) A PIC of a small aeroplane shall ensure that the flight crew members are able to speak and understand the language used for aeronautical radiotelephony communications as specified in the Civil Aviation (Personnel Licensing) Regulations, 2022.

(10) A PIC of a small aeroplane shall ensure that the aeroplane has—

- (a) equipment and instruments; and
- (b) communication, navigation and surveillance equipment, specified in the Civil Aviation (Instruments and Equipment) Regulations, 2022.

6. Dangerous goods

A PIC of a small aeroplane registered in Uganda shall comply with the provisions on carriage of dangerous goods by air in accordance with the Civil Aviation (Safe Transport of Dangerous Goods by Air) Regulations, 2022.

7. Use of psychoactive substances

(1) A person shall not engage in any kind of problematic use of psychoactive substances.

(2) A member of a flight crew shall not perform any function specified in the privileges applicable to the member's licence if the member is under the influence of any psychoactive substance which may render the member unable to perform the functions in a safe and proper manner.

(3) Safety-sensitive personnel shall not undertake any function while under the influence of any psychoactive substance, by reason of which human performance is impaired.

8. Specific approval

(1) A PIC of a small aeroplane shall not conduct operations for which a specific approval is required, unless the approval has been issued by the authority.

(2) Any specific approvals required to be obtained under subregulation (1) shall follow the layout and shall contain the information specified in Schedule 2 to these Regulations.

Flight Operations

9. Operating facilities

A PIC of a small aeroplane shall not commence a flight unless he or she ascertains, by all reasonable means available that the ground facilities, water facilities, communication facilities and navigation aids required on the flight are available and adequate for the safe operation of the aeroplane, and the type of operation under which the flight is to be conducted.

10. General operational management instructions

(1) An aeroplane shall not be taxied on the movement area of an aerodrome unless the person at the controls—

- (a) is an appropriately qualified pilot; and
- (b) has received instructions from a competent person with respect to aerodrome layout and, where appropriate,

information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for the safe movement of an aeroplane at the aerodrome.

- (2) An aeroplane may be taxied by a person who—
 - (a) has been duly authorised by the owner or, where it is leased, the lessee or a designated agent;
 - (b) is fully competent to taxi the aeroplane;
 - (c) is qualified to use the radio, if radio communications are required; and
 - (d) has received instructions from a competent person with respect to aerodrome layout and, where appropriate, information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for the safe movement of an aeroplane at the aerodrome.

11. Aerodrome operating minima

(1) A PIC shall establish aerodrome operating minima in accordance with the criteria specified by the authority for each aerodrome to be used in the operations.

(2) The minima shall not be lower than any that may be established for such aerodromes by the State of the aerodrome, except when specifically approved by that State.

(3) The authority may approve operational credit for operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, and such approvals shall not affect the classification of the instrument approach procedure.

(4) An instrument approach operation shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows—

- (a) Type A, which is a minimum descent height or decision height at or above 75 metres (250 feet); and
- (b) Type B, which is a decision height below 75 metres (250 feet), where Type B instrument approach operations are categorised as follows—
 - (i) Category I (CAT I) which is a decision height not lower than 60 metres (200 feet) and with either a visibility not less than 800 metres or a runway visual range not less than 550 metres;
 - (ii) Category II (CAT II) which is a decision height lower than 60 metres (200 feet) but not lower than 30 metres (100 feet) and a runway visual range not less than 300 metres;
 - (iii) Category IIIA (CAT IIIA) which is a decision height lower than 30 metres (100 feet) or no decision height and no runway visual range limitations;
 - (iv) Category IIIB (CAT IIIB) which is a decision height lower than 15 metres (50 feet) or no decision height and a runway visual range less than 175 metres but not less than 50 metres; and
 - (v) Category IIIC (CAT IIIC) which is no decision height and no runway visual range limitations.

(5) The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDh), minimum visibility and, if necessary, cloud conditions.

(6) The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.

12. Passengers

(1) A PIC shall ensure that passengers are made familiar with the location and use of—

- (a) the seat belts;
- (b) the emergency exits;
- (c) the life jackets, if the carriage of life jackets is prescribed;
- (d) the oxygen dispensing equipment if the use of oxygen is anticipated; and
- (e) any other emergency equipment provided for individual use, including passenger emergency briefing cards.

(2) The PIC shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

(3) In an emergency during flight, the PIC shall ensure that passengers are instructed in such emergency action as may be appropriate to the circumstances.

(4) The PIC shall ensure that during take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board the aeroplane are secured in their seats by means of the seat belts or harnesses provided.

13. Flight preparation

(1) A flight shall not be commenced until a PIC is satisfied that—

- (a) the aeroplane is airworthy, duly registered and appropriate certificates with respect to the aeroplane are carried on board the aeroplane;
- (b) the instruments and equipment installed in the aeroplane are appropriate, taking into account the expected flight conditions;

- (c) any necessary maintenance has been performed in accordance with these Regulations;
- (d) the mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
- (e) any load carried is properly distributed and safely secured; and
- (f) the aeroplane operating limitations, contained in the flight manual, or its equivalent, shall not be exceeded.

(2) The PIC shall have sufficient information on the climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off and intended take-off technique.

14. Flight planning

(1) A PIC shall, before commencing a flight, be familiar with all available meteorological information appropriate for the intended flight.

(2) The PIC shall, during the preparation for a flight away from the vicinity of the place of departure, and for every flight under the instrument flight rules include —

- (a) a study of available current weather reports and forecasts; and
- (b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

15. Meteorological conditions for VFR Flights

VFR flights shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route

to be flown under VFR shall, at the appropriate time, be such as to enable compliance with these Regulations.

16. IFR flights

(1) A flight to be conducted in accordance with the IFR shall not—

- (a) take off from the departure aerodrome, unless the meteorological conditions, at the time of use are at or above the aerodrome operating minima for that operation; and
- (b) take off or continue beyond the point of in-flight re-planning unless, at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with these Regulations and the current meteorological reports or a combination of current reports and forecasts indicated that the meteorological conditions shall be, at the estimated time of use, at or above the aerodrome operating minima for that operation.

(2) The State of Registry shall establish criteria to be used for the estimated time of use of an aerodrome, including a margin of time.

17. Flight in known icing conditions

(1) A flight to be operated in known or expected icing conditions shall not be commenced unless the aeroplane is certificated and equipped to cope with the conditions.

(2) A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off unless the aeroplane has been inspected for icing and, where necessary, has been given appropriate de-icing or anti-icing treatment.

(3) Any accumulation of ice or other naturally occurring contaminants shall be removed so that the aeroplane is kept in an airworthy condition prior to take-off.

18. Destination alternate aerodromes

Before a flight is conducted in accordance with the IFR, at least one destination alternate aerodrome shall be selected and specified in the flight plans unless—

- (a) the duration of the flight from the departure aerodrome, or from the point of in-flight re-planning to the destination aerodrome is such that, taking into account all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a reasonable certainty exists that—
 - (i) the approach and landing may be made under visual meteorological conditions; and
 - (ii) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure; or
- (b) the aerodrome of intended landing is isolated and a standard instrument approach procedure is prescribed for the aerodrome of intended landing and a point of no return has been determined and a flight is not continued past the point of no return unless available current meteorological information indicates that the following meteorological conditions shall exist at the estimated time of use—
 - (i) a cloud base of at least 300 metres (1000 feet) above the minimum associated with the instrument approach procedure; and
 - (ii) visibility of at least 5.5 kilometres (3 NM) or of 4 kilometres (2 NM) more than the minimum associated with the instrument approach procedure.

19. Fuel and oil requirements

(1) A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in

flight, the aeroplane carries sufficient fuel and oil to ensure that it may safely complete the flight.

- (2) The amount of fuel to be carried shall permit—
 - (a) when the flight is conducted in accordance with the IFR and a destination alternate aerodrome is not required in accordance with these Regulations, or when the flight is to an isolated aerodrome, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least forty- five minutes at normal cruising altitude;
 - (b) when the flight is conducted in accordance with the IFR and a destination alternate aerodrome is required, flight to the aerodrome of intended landing, then to an alternate aerodrome, and after that, have a final reserve fuel for at least forty-five minutes at normal cruising altitude;
 - (c) when the flight is conducted in accordance with day VFR, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least thirty minutes at normal cruising altitude; or
 - (d) when the flight is conducted in accordance with night VFR, flight to the aerodrome of intended landing and thereafter have a final reserve fuel for at least forty-five minutes at normal cruising altitude.

(3) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, where applicable, adjustment of the planned operation.

20. Refuelling with passengers on board

(1) An aeroplane shall not be refuelled when passengers are embarking, on board or disembarking unless the refuelling is attended by the PIC or other qualified personnel who shall be ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

(2) When refuelling with passengers embarking, on board or disembarking, two-way communications shall be maintained by the aeroplane's intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel.

21. Oxygen supply

(1) A PIC shall ensure that breathing oxygen is available to crew members and passengers in sufficient quantities for all flights at such altitudes where a lack of oxygen might result in impairment of the faculties of crew members or harmfully affect passengers.

(2) For the purposes of supplying sufficient oxygen, the pilot-in-command shall take into consideration the approximate altitudes in the standard atmosphere corresponding to the values of absolute pressure as follows—

| <i>Absolute pressure</i> | <i>Metres</i> | <i>Feet</i> |
|--------------------------|---------------|-------------|
| 700 hPa | 3 000 | 10 000 |
| 620 hPa | 4 000 | 13 000 |
| 376 hPa | 7 600 | 25 000 |

22. In-flight procedures for aerodrome operating minima

(1) A flight shall not be continued towards the aerodrome of intended landing unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that aerodrome or at least one destination alternate aerodrome in compliance with the operating minima established in these Regulations.

(2) An instrument approach shall not be continued below 300 metres (1000 feet) above the aerodrome elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome operating minima.

(3) Where, after entering the final approach segment or after descending below 300 metres (1000 feet) above the aerodrome elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to the descent altitude (DA) or minimum descent altitude (MDA) or minimum descent height (MDH).

(4) Notwithstanding subregulation (3), an aeroplane shall not continue its approach to land beyond a point at which the limits of the aerodrome operating minima would be infringed.

23. Meteorological and operational observations by pilots

(1) Where meteorological or weather conditions likely to affect the safety of other aircraft are encountered, a PIC shall, as soon as possible, report the weather conditions to the nearest appropriate aeronautical station or any other appropriate authority.

(2) The PIC shall report any runway braking action where the runway braking action encountered is not as good as given by the appropriate aeronautical station.

24. Hazardous flight conditions

(1) Any hazardous flight conditions encountered, other than those associated with meteorological conditions, shall be reported to the appropriate aeronautical station as soon as possible.

(2) The reports referred to in subregulation (1) shall give such details as may be pertinent to the safety of other aircraft.

25. Flight crew members at duty stations

(1) All flight crew members required to be on flight deck duty shall be at their stations during take-off and landing.

(2) During the en-route phase of a flight, all flight crew members required to be on flight deck duty shall remain at their stations

except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.

(3) All flight crew members shall keep their seat belts fastened when at their stations.

(4) Where safety harnesses are provided, any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases.

(5) All flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

26. Aeroplane operating procedures for landing performance

An approach to land shall not be continued below 300 metres (1000 feet) above aerodrome elevation unless the PIC is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

27. Use of oxygen by flight crew members

All flight crew members shall, when engaged in performing duties essential to the safe operation of an aeroplane in flight, use breathing oxygen continuously whenever the circumstances prevail for which its supply has been prescribed in these Regulations.

28. Safeguarding of cabin crew and passengers in event of loss of pressurisation

(1) The cabin crew shall be safeguarded to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurisation and, shall have means of protection to enable them to administer first aid to passengers during stabilised flight following the emergency.

(2) All passengers shall be safeguarded by such devices or operational procedures that ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurisation.

29. In-flight fuel management

(1) A PIC shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

(2) The PIC shall request delay information from ATC where unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.

(3) A PIC shall advise ATC of a minimum fuel state by declaring “MINIMUM FUEL” when, having committed to land at a specific aerodrome, the PIC calculates that any change to the existing clearance to that aerodrome may result in landing with less than the planned final reserve fuel.

(4) For the purposes of subregulation (3), a declaration of “MINIMUM FUEL” informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than the planned final reserve fuel.

(5) A declaration of “MINIMUM FUEL” does not qualify as an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

(6) The PIC shall declare a situation of fuel emergency by broadcasting “MAYDAY MAYDAY MAYDAY FUEL” when the

calculated usable fuel estimated to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

30. Instrument approach procedures

(1) A State in which an aerodrome is located shall approve one or more instrument approach procedures designed to support instrument approach operations to serve each instrument runway or aerodrome utilised for instrument flight operations.

(2) An aeroplane operated in accordance with the IFR shall comply with the instrument approach procedures approved by the State in which the aerodrome is located.

31. Duties of PIC

(1) A PIC shall be responsible for the operation, safety and security of the aeroplane and the safety of all crew members, passengers and cargo on board.

(2) The PIC shall be responsible for ensuring that a flight shall not be—

(a) commenced, if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue or the effects of any psychoactive substance; and

(b) continued beyond the nearest suitable aerodrome when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen.

(3) The PIC shall be responsible for notifying the nearest appropriate authority, by the quickest available means, of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property.

32. Cabin baggage to be securely stowed

A PIC shall ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is securely stowed.

Aeroplane Performance Operating Limitations

33. General aeroplane performance operating limitations

- (1) An aeroplane shall be operated—
 - (a) in compliance with the terms of its airworthiness certificate or equivalent documents;
 - (b) within the operating limitations prescribed by the authority; and
 - (c) within the mass limitations imposed by compliance with the applicable noise certificate issued by the authority, unless otherwise authorised in exceptional circumstances for a certain aerodrome or a runway, where there is no noise disturbance problem, by the competent authority of the State in which the aerodrome is situated, where applicable.

(2) The placards, listings, instrument markings or combinations, containing operating limitations prescribed by the authority of the State of Registry for visual presentation, shall be displayed in the aeroplane.

(3) A PIC shall determine that an aeroplane performance shall permit the take-off and departure to be carried out safely.

Aeroplane Continuing Airworthiness

34. Owner's continuing airworthiness responsibilities

(1) An owner or lessee of an aeroplane, shall ensure that, in accordance with procedures approved by the authority—

- (a) the aeroplane is maintained in an airworthy condition;
- (b) the operational and emergency equipment necessary for an intended flight is serviceable; and
- (c) the certificate of airworthiness of the aeroplane remains valid.

(2) An owner or the lessee of an aeroplane shall not operate the aeroplane unless maintenance on the aeroplane, including any associated engine, propeller and part, is carried out—

- (a) by an organisation complying with airworthiness regulations approved by the authority or by another contracting State, and the organisation is acceptable by the authority; or
- (b) by a qualified person or organisation in accordance with procedures authorised by the authority, and there is a maintenance release in relation to the maintenance carried out.

(3) The owner or the lessee of an aeroplane shall ensure that the maintenance of the aeroplane is performed in accordance with a maintenance programme acceptable to the authority.

35. Continuing airworthiness records

(1) An owner or lessee of an aeroplane, shall ensure that the following records are kept for the periods stated in these Regulations—

- (a) the total time in service, including hours, calendar time and cycles, as appropriate, of the aeroplane and all life-limited components;
- (b) the current status of compliance of the aeroplane with all applicable mandatory continuing airworthiness information;
- (c) the appropriate details of modifications and repairs to the aeroplane;

- (d) the time in service, including hours, calendar time and cycles, as appropriate, since the last overhaul of the aeroplane or its components subject to a mandatory overhaul life;
- (e) the current status of the aeroplane's compliance with the maintenance programme; and
- (f) the detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

(2) An owner or lessee of an aeroplane shall keep the records referred to in subregulations (1) (a) to (e) for a minimum period of one hundred and eighty days after the unit to which the records refer has been permanently withdrawn and the records referred to in subregulation (1) (f) for a minimum period of two years after the signing of the maintenance release.

(3) In the event of a temporary change of owner or lessee of the aeroplane, the owner or lessee of an aeroplane shall make the records available to the new owner or lessee, and a notice in writing of the temporary change of ownership or lessee shall be made to the authority.

(4) In the event of any permanent change of owner or lessee of the aeroplane, the records shall be transferred to the new owner or lessee, and a notice in writing of the permanent change of owner or lessee shall be made to the authority.

(5) The records required to be kept or transferred in accordance with this regulation shall be maintained in a form and format that ensures the readability, security and integrity of the records.

36. Modifications and repairs

(1) All modifications and repairs shall comply with airworthiness requirements acceptable to the authority.

(2) An owner shall establish procedures to ensure that the substantiating data supporting compliance with airworthiness requirements are retained.

37. Maintenance release

(1) Where an Approved Maintenance Organisation carries out maintenance work on an aeroplane under this Part, the approved maintenance organisation shall issue a maintenance release in accordance with of the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) Where an organisation that is not an Approved Maintenance Organisation carries out the maintenance work on an aeroplane, under this Part a maintenance release shall be completed by a person appropriately licensed in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022.

(3) A person referred to in subregulation (2) shall certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures approved by the authority.

(4) Where an organisation that is not an approved maintenance organisation carries out the maintenance work, the maintenance release under subregulation (2) shall include—

- (a) the basic details of the maintenance work performed;
- (b) the date on which the maintenance work was completed; and
- (c) the identity of the authorised person or persons signing the release.

Aeroplane Flight Crew

38. Composition of flight crew

The number and composition of a flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

39. Qualifications of crew members

- (1) A PIC shall—
 - (a) ensure that each flight crew member holds a valid licence issued by the authority or by another State, and where the licence is issued by another State, that the licence is rendered valid by the authority;
 - (b) ensure that flight crew members are properly rated; and
 - (c) be satisfied that flight crew members have the required competency.

(2) A PIC of an aeroplane equipped with an Airborne Collision Avoidance System (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collision.

Manuals, Logs and Records

40. Flight manual

A flight manual shall be updated by implementing the mandatory changes made by the State of design.

41. Journey logbook

- (1) A journey logbook shall be maintained for every aeroplane engaged in air navigation.
- (2) A journey logbook shall contain—
 - (a) the aeroplane nationality and registration;
 - (b) the date of the flight;
 - (c) the names of the crew members and their duty assignments;
 - (d) the departure and arrival points and times of the flight;
 - (e) the purpose of the flight;
 - (f) the observations regarding the flight; and
 - (g) the signature of the PIC.

42. Records of emergency and survival equipment

(1) An operator of an aeroplane shall, at all times, have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board the aeroplane engaged in international air navigation.

(2) The information shall include, where applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

Security

43. Security of aeroplane

A PIC shall be responsible for the security of the aeroplane during the aeroplane's operation.

44. Reporting acts of unlawful interference

Where an act of unlawful interference occurs, the PIC shall submit a report of the act to the designated local authority.

PART III— OPERATIONS FOR LARGE AND TURBOJET AEROPLANES

45. Application of Part

This Part applies to—

- (a) general aviation operations for aeroplanes with a maximum certificated take-off mass exceeding 5700 kilograms;
- (b) general aviation operations for aeroplanes equipped with one or more turbojet engines; and
- (c) general aviation operations for aeroplanes with a seating configuration of more than nine passenger seats.

Corporate Aviation Operations

46. Corporate aviation operations

(1) A corporate aviation operation involving three or more aircraft that are operated by pilots employed for the purpose of flying the aircraft shall be conducted in accordance with these Regulations.

(2) For the purpose of subregulation (1) the “aircraft” means an aeroplane or helicopter used for the purpose of corporate aviation.

General

47. Compliance with laws, regulations and procedures

(1) An operator of an aeroplane shall ensure that all employees comply with the laws, regulations and procedures of the States in which operations of the aeroplane are conducted.

(2) An operator of an aeroplane shall ensure that all pilots are familiar with the laws, regulations and procedures pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating to the aerodromes.

(3) An operator of an aeroplane shall ensure that members of the flight crew are familiar with the laws, regulations and procedures that are pertinent to the performance of their respective duties in the operation of the aeroplane.

(4) A PIC of an aeroplane is responsible for the operational control of the aeroplane.

(5) An operator shall describe the operational control system in the operations manual and identify the roles and responsibilities of all persons involved with the operational control system.

(6) An operator shall ensure that the PIC of an aeroplane has available on board the aeroplane, all the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

(7) An operator shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in the Civil Aviation (Personnel Licensing) Regulations, 2022.

48. Safety management

(1) The use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident according to the Civil Aviation (Aircraft Accidents and Incidents Investigations) Regulations, 2022 is prohibited, except where the recordings or transcripts are—

- (a) related to a safety-related event identified in the context of a safety management system;
- (b) restricted to the relevant portions of a de-identified transcript of the recording;
- (c) subject to the protections accorded by the Civil Aviation (Safety Management) Regulations, 2022;
- (d) sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by the Civil Aviation (Safety Management) Regulations, 2022; or
- (e) used for inspections of flight recorder systems.

(2) The use of recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS for purposes other than the investigation of an accident or incident according to the Civil Aviation (Aircraft Accidents and Incidents Investigations) Regulations, 2022 is prohibited, except where the recordings or transcripts are subject to the protections accorded by the Civil Aviation (Safety Management) Regulations, 2022 and are—

- (a) used by the operator for airworthiness or maintenance purposes;

- (b) sought for use in proceedings not related to an event involving an accident or incident investigation;
- (c) de-identified; or
- (d) disclosed under secure procedures.

Flight Operations

49. Operating facilities

An operator shall ensure that a flight shall not be commenced unless he or she ascertains, by all reasonable means available, that the ground facilities, water facilities, communication facilities and navigation aids required for the flight are available and adequate for the safe operation of the aeroplane and for the type of operation under which the flight is to be conducted.

50. Operational management

(1) Where an operator has an operating base in a State other than the State of Registry, the operator shall notify the State in which the operating base is located of the operations to be carried out.

(2) Upon notification in accordance with subregulation (1), safety and security oversight shall be coordinated between the State in which the operating base is located and the State of Registry.

51. Operations manual

(1) An operator shall provide an operations manual for the use and guidance of the personnel concerned, containing all the instructions and information necessary for the operations personnel to perform their duties.

(2) The operations manual shall be in the format prescribed in Schedule 3 to these Regulations.

(3) The operations manual shall be amended or revised as is necessary to ensure that the information contained in the manual is kept up to date.

(4) All amendments or revisions referred to in subregulation (3) shall be issued to all personnel required to use the manual.

52. General operating instructions

(1) An operator shall ensure that all the operations personnel are properly instructed in their particular duties and responsibilities and the relationship of their duties to the operation as a whole.

(2) An operator shall issue operating instructions and provide information on aeroplane climb performance with all engines operating to enable the PIC to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

(3) The information referred to in subregulation (2) shall be included in the operations manual.

53. In-flight simulation of emergency situations

An operator shall not simulate emergency or abnormal situations when passengers are on board an aeroplane.

54. Checklists

(1) The flight crew shall use checklists prior to, during and after all phases of operations and in emergencies, to ensure compliance with the operating procedures contained in the aircraft operating manual and the aeroplane flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual.

(2) The design and utilisation of checklists shall observe human factors principles.

55. Minimum flight altitudes

An operator shall specify, for flights which are to be conducted in accordance with the instrument flight rules, the method of establishing terrain clearance altitudes.

56. Aerodrome operating minima

(1) An operator shall establish aerodrome operating minima in accordance with the criteria specified by the authority in the aeronautical information publications for every aerodrome to be used in the operations.

(2) When establishing aerodrome operating minima, any conditions that may be prescribed in the list of specific approvals shall be observed by the operator.

(3) The aerodrome operating minima referred to in subregulation (2) shall not be lower than that established for such aerodromes by the State of the aerodrome, except where specifically approved by that State.

57. Fatigue management programme

(1) An operator shall establish and implement a fatigue management programme that ensures that all personnel involved in the operation and maintenance of an aeroplane do not carry out their duties when fatigued.

(2) The programme referred to in subregulation (1) shall address flight and duty times and be included in the operations manual.

58. Passengers

(1) An operator shall ensure that passengers are familiar with the location and use of—

- (a) seat belts;
- (b) emergency exits;
- (c) life jackets, where the carriage of life jackets is prescribed;
- (d) oxygen dispensing equipment, where the provision of oxygen for the use of passengers is prescribed; and
- (e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

(2) An operator shall ensure that all persons on board an aeroplane are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

(3) An operator shall ensure that in case an emergency during a flight, passengers are instructed in emergency action appropriate to the circumstances.

(4) An operator shall ensure that during take-off and landing and whenever necessary, by reason of turbulence or any emergency occurring during flight, all passengers on board an aeroplane are secured in their seats by means of the seat belts or harnesses provided.

59. Flight preparation

(1) An operator shall develop procedures to ensure that a flight does not commence unless—

- (a) the aeroplane is airworthy, duly registered and that appropriate certificates with respect to the aeroplane are aboard the aeroplane;
- (b) the instruments and equipment installed in the aeroplane are appropriate, taking into account the expected flight conditions;
- (c) any necessary maintenance has been performed in accordance with these Regulations;
- (d) the mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;
- (e) any load carried on the aeroplane is properly distributed and safely secured; and
- (f) the aeroplane operating limitations, contained in the flight manual, or its equivalent, shall not be exceeded.

(2) An operator shall make available sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

60. Operational flight planning

An operator shall specify flight planning procedures to provide for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned and procedures shall be included in the operations manual.

61. Alternate aerodromes

(1) A take-off alternate aerodrome shall be selected and specified in the flight plan where either the meteorological conditions at the aerodrome of departure are below the applicable aerodrome landing minima for that operation or where an aeroplane would not be possible to return to the aerodrome of departure for other reasons.

(2) The take-off alternate aerodrome shall be located within the following flight time from the aerodrome of departure—

- (a) for aeroplanes with two engines, one hour of flight time at a one-engine-inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still - air conditions using the actual take-off mass; or
- (b) for aeroplanes with three or more engines, two hours of flight time at an all engines operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass.

(3) For an aerodrome to be selected as a take-off alternate, the available information shall indicate that, at the estimated time of use, the conditions shall be at or above the applicable aerodrome operating minima for that operation.

62. Fuel requirements

(1) An aeroplane shall carry a sufficient amount of usable fuel to complete the planned flight safely and to allow for deviations from the planned operation.

(2) The amount of usable fuel to be carried shall, as a minimum, be based on—

- (a) fuel consumption data —
 - (i) provided by the aeroplane manufacturer; or
 - (ii) if available, current aeroplane-specific data derived from a fuel consumption monitoring system; and
- (b) the operating conditions for the planned flight including—
 - (i) anticipated aeroplane mass;
 - (ii) notices to airmen;
 - (iii) current meteorological reports or a combination of current reports and forecasts;
 - (iv) air traffic services procedures, restrictions and anticipated delays; and
 - (v) the effects of deferred maintenance items or configuration deviations.

(3) Where no specific fuel consumption data exists for the precise conditions of the flight, the aeroplane may be operated in accordance with estimated fuel consumption data.

(4) The pre-flight calculation of usable fuel required shall include—

- (a) taxi fuel, which shall be the amount of fuel expected to be consumed before take-off, taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;
- (b) trip fuel, which shall be the amount of fuel required to enable the aeroplane to fly from take-off until landing at the destination aerodrome;
- (c) contingency fuel, which shall be the amount of fuel required to compensate for unforeseen factors and shall be not less than five per cent of the planned trip fuel;

- (d) destination alternate fuel, which shall be —
 - (i) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to perform a missed approach at the destination aerodrome or climb to the expected cruising altitude or fly the expected routing or descend to the point where the expected approach is initiated; and conduct the approach and landing at the destination alternate aerodrome;
 - (ii) where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 450 m (1 500 ft) above destination aerodrome elevation in standard conditions; or
 - (iii) where the aerodrome of intended landing is an isolated aerodrome—
 - (aa) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 per cent of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less; or
 - (ab) for a turbine-engined aeroplane, the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel;
- (e) final reserve fuel, which shall be the amount of fuel on arrival at the destination alternate aerodrome or the destination aerodrome when no destination alternate aerodrome is required—
 - (i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes; or

(ii) for a turbine-engined aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 metres (1500 feet) above aerodrome elevation in standard conditions;

(f) additional fuel, which shall be the supplementary amount of fuel required to enable the aeroplane to descend as necessary and proceed to land at an alternate aerodrome in the event of engine failure or loss of pressurisation based on the assumption that such a failure occurs at the most critical point along the route; and

(g) discretionary fuel, which shall be the extra amount of fuel to be carried at the discretion of the PIC.

(5) An operator shall determine one final reserve fuel value for each aeroplane type and variant in the fleet rounded up to an easily recalled figure.

(6) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re- analysis and, if applicable, adjustment of the planned operation.

63. Additional requirements for operations beyond sixty minutes to en-route alternate aerodrome

Where conducting operations beyond sixty minutes from a point on a route to an en-route alternate aerodrome, an operator shall ensure that—

(a) en-route alternate aerodromes are identified; and

(b) the PIC has access to current information on the identified en-route alternate aerodromes, including operational status and meteorological conditions.

64. Refuelling with passengers on board

(1) An aeroplane shall not be refuelled while passengers are embarking, on board or disembarking unless the aeroplane is

properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

(2) Where refuelling with passengers embarking, on board or disembarking, two-way communication shall be maintained by the aeroplane's intercommunication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the aeroplane.

(3) An operator shall establish additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.

65. Oxygen supply

(1) A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments shall be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply—

- (a) all crew members and ten percent of the passengers for any period in excess of thirty minutes that the pressure in compartments occupied by them between 700 hPa and 620 hPa; and
- (b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them less than 620 hPa.

(2) A flight to be operated with a pressurised aeroplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa.

(3) Where an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a ten minute supply for the occupants of the passenger compartment.

66. Use of oxygen

(1) All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its use is required.

(2) All flight crew members of pressurised aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which shall readily supply oxygen upon demand.

67. In-flight procedures instrument approaches

An operator shall include, in the aircraft operating manual recommended in these Regulations, operating procedures for conducting instrument approaches.

68. Aeroplane operating procedures for noise abatement

(1) An aeroplane operating procedures for noise abatement shall comply with the provisions of the noise abatement procedures in the operations manual.

(2) The noise abatement procedures specified by the operator for a particular aeroplane type shall be the same for all aerodromes.

69. Aeroplane operating procedures for rates of climb and descent

Unless otherwise specified in an air traffic control instruction, to avoid unnecessary airborne collision avoidance system (ACAS II), resolution

advisories in aeroplanes at or approaching adjacent altitudes or flight levels, pilots shall consider using appropriate procedures to ensure that a rate of climb or descent of less than 8 metres/second or 1500 feet/min, depending on the instrumentation available, is achieved throughout the last 300 metres (1000 feet) of climb or descent to the assigned altitude or flight level, when made aware of another aeroplane at or approaching an adjacent altitude or flight level.

70. Aeroplane operating procedures for landing performance

An approach to land shall not be continued below 300 metres (1000 feet) above aerodrome elevation unless the PIC is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

71. Duties of PIC

(1) A PIC shall ensure that the checklists specified in these Regulations are complied with.

(2) A PIC shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property.

(3) Where the PIC is incapacitated in an accident, the operator shall take over the duties of the PIC.

(4) A PIC shall be responsible for reporting, all known or suspected defects in the aeroplane to the operator at the termination of the flight.

(5) A PIC shall be responsible for the journey logbook or the general declaration containing the information listed in regulation 41.

72. Securing cabin baggage for take-off and landing

The operator shall specify procedures to ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.

PART IV—AEROPLANE PERFORMANCE OPERATING LIMITATIONS FOR LARGE AND TURBOJET AEROPLANES

73. General

For aeroplanes above 5,700kg certificated between 13th June, 1960 and 2nd March, 2004 and aeroplanes certificated after 2nd March, 2004 for which airworthiness regulations are not applicable because of the exemption provided, the authority shall ensure that the levels of performance specified in this Part are met as far as practicable.

74. Performance limitation of aeroplanes above 5,700kg certificated between 13th June, 1960 and 2nd March, 2004 and aeroplanes certificated after 2nd March, 2004

(1) This regulation applies to large aeroplanes which were certificated between 13th June, 1960 and 2nd March, 2004 and those certificated after 2nd March, 2004.

(2) An aeroplane shall be operated in compliance with the terms of the aeroplane's certificate of airworthiness and within the approved operating limitations contained in its flight manual.

(3) The authority shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these Regulations is maintained under all expected operating conditions, including those not covered specifically by this regulation.

(4) A flight shall not be commenced unless the performance information provided in the flight manual indicates that the provisions of this regulation can be complied with for the flight to be undertaken.

(5) In applying this regulation, account shall be taken of all factors that significantly affect the performance of an aeroplane such

as mass, operating procedures, the pressure altitude appropriate to the elevation of the aerodrome, temperature, wind, runway gradient and condition of runway, including presence of slush, water or ice for landplanes and water surface condition for seaplanes.

(6) The factors referred to in subregulation (5) shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.

75. Mass limitations

(1) The mass of an aeroplane at the start of take-off shall not exceed the mass at which the requirements of subregulation (5) are complied with, or the mass at which subregulations (7) and (8) are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying subregulations (7) and (8) and, in respect of alternate aerodromes, subregulations (3) and (7).

(2) The mass of an aeroplane at the start of take-off shall not exceed the maximum take-off mass specified in the flight manual for the pressure altitude appropriate to the elevation of the aerodrome, and if used as a parameter to determine the maximum take-off mass, any other local atmospheric condition.

(3) The estimated mass of an aeroplane for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, shall not exceed the maximum landing mass specified in the flight manual for the pressure altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the maximum landing mass, any other local atmospheric condition.

(4) The mass of an aeroplane at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, shall not exceed the relevant

maximum masses at which compliance has been demonstrated with the applicable noise certification requirements unless otherwise authorised in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the State in which the aerodrome is situated.

(5) An aeroplane shall be able, in the event of a critical engine failing at any point in the take-off, either to discontinue the take-off and stop within either the accelerate-stop distance available or the runway available, or to continue the take-off and clear all obstacles along the flight path by an adequate margin until the aeroplane is in a position to comply with the requirements of this regulation.

(6) In determining the length of the runway available, account shall be taken of the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

(7) An aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions, to continue the flight to an aerodrome at which this regulation can be met, without flying below the minimum obstacle clearance altitude at any point.

(8) An aeroplane shall be able, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, to land with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available.

(9) For the purposes of subregulation (8), allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

Aeroplane Continuing Airworthiness

76. Operator's continuing airworthiness responsibilities

(1) An operator shall comply with the requirements prescribed under regulation 34.

(2) An operator shall ensure that all maintenance personnel receive initial and continuation training approved by the authority and appropriate to the personnel's assigned tasks and responsibilities, including human factors principles and coordination with other maintenance personnel and flight crew.

77. Continuing airworthiness information

An operator of an aeroplane of a maximum certificated take-off mass in excess of 5700kg, shall ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness, is transmitted as required by the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

78. Maintenance control manual

(1) An operator shall provide a maintenance control manual for the use and guidance of maintenance and operations personnel.

(2) The design and application of the operator's maintenance control manual shall observe human factors principles.

79. Maintenance programme

(1) An operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, approved by the authority.

(2) The maintenance programme shall contain the following information—

- (a) maintenance tasks and the intervals at which they are to be performed, taking into account the anticipated utilisation of an aeroplane;
- (b) a continuing structural integrity programme, where applicable;
- (c) procedures for changing or deviating from (a) and (b) as approved by the State of Registry; and

(d) an approved by the maintenance programme State of Registry, condition monitoring and reliability programme descriptions for aeroplane systems, components and engines, where applicable.

(3) The maintenance programme shall be based on maintenance programme information made available by the State of Design or by the organisation responsible for the type design, and any additional applicable experience.

(4) Maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance programme shall be identified as such.

(5) The design and application of the operator's maintenance programme shall observe human factors principles.

(6) Copies of all amendments to the maintenance programme shall be furnished promptly to all organisations or persons to whom the maintenance programme is issued.

80. Maintenance release

(1) Where an Approved Maintenance Organisation carries out maintenance work on an aeroplane under this Part, the Approved Maintenance Organisation shall issue a maintenance release in accordance with of the Civil Aviation (Airworthiness of Aircraft) Regulations, 2022.

(2) Where an organisation that is not an Approved Maintenance Organisation carries out the maintenance work on an aeroplane under this Part, a maintenance release shall be completed by a person appropriately licensed in accordance with the Civil Aviation (Personnel Licensing) Regulations, 2022 who shall certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures approved by the authority.

(3) Where an organisation that is not an Approved Maintenance Organisation carries out the maintenance work, the maintenance release under subregulation (2) shall include the following—

- (a) the basic details of the maintenance work performed;
- (b) the date on which the maintenance work was completed; and
- (c) the identity of the authorised person or persons signing the release.

Aeroplane Flight Crew

81. Composition of flight crew

An operator shall, for each flight, designate a pilot to act as PIC.

82. Flight engineer

Where a separate flight engineer's station is incorporated in the design of an aeroplane, the flight crew shall include at least one flight engineer specifically assigned to that station, unless the duties associated with that station can be satisfactorily performed by another flight crew member, holding a flight engineer licence, without interference with regular duties.

83. Flight crew member emergency duties

An operator shall, for each type of aeroplane, assign to all flight crew members the necessary functions to perform in an emergency or in a situation requiring emergency evacuation.

84. Flight crew member training programme

(1) An operator shall establish and maintain a training programme designed to ensure that a person who receives training acquires and maintains the competency to perform assigned duties, including skills related to human performance.

(2) An operator shall establish ground and flight training programmes, either through internal programmes or through a training services provider, and shall include or make reference to a syllabus for the training programmes in the company operations manual.

(3) A training programme shall include training to competency for all equipment installed.

(4) The recurrent training in accomplishing functions referred to in subregulation (1) shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the aeroplane.

(5) A flight simulator shall be used to the maximum extent practicable for initial and bi-annual recurrent training.

85. Flight crew members qualifications

(1) An operator shall—

- (a) ensure that each flight crew member assigned to duty holds a valid licence issued by the authority or by another State, and if the licence is issued by another State that, the licence is rendered valid by the authority;
- (b) ensure that flight crew members are properly rated; and
- (c) ensure that flight crew members are competent to carry out assigned duties.

(2) The operator of an aeroplane equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member is appropriately trained to competency in the use of ACAS II equipment and the avoidance of collisions.

86. Recent experience

(1) An operator shall not assign a pilot to act as pilot-in -command of an aeroplane unless that pilot has made at least three take-offs and landings within the preceding ninety days on the same type of aeroplane or in a flight simulator approved for that purpose.

(2) An operator shall not assign a co-pilot to operate at the flight controls of an aeroplane during take-off and landing unless that pilot has made at least three take-offs and landings within the preceding ninety days on the same type of aeroplane or in a flight simulator approved for the purpose.

87. Pilot proficiency checks

(1) An operator shall ensure that piloting technique and the ability to execute emergency procedures by a PIC is checked periodically in such a way as to demonstrate the pilot's competence.

(2) Where the operation may be conducted under the instrument flight rules, the operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or a representative of the authority.

(3) The number of times of the checks referred to in subregulation (2) is dependent upon the complexity of both the aeroplane and the operation but, in any case, no longer than six months.

Flight Operations Officer and Cabin Crew

88. Flight operations officer

An operator shall ensure that any person assigned as a flight operations officer is trained and maintains familiarisation with all features of the operation which are pertinent to their duties, including knowledge and skills related to human factors principle.

89. Cabin crew assignment of emergency duties

The requirement for cabin crew for each type of aeroplane shall be determined by the operator, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the aeroplane and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation, and the operator shall assign these functions for each type of aeroplane.

90. Cabin crew at emergency evacuation stations

Where applicable, each cabin crew member assigned to emergency evacuation duties shall occupy a seat provided in accordance with the Civil Aviation (Instruments and Equipment) Regulations, 2022 during take-off and landing and whenever the PIC so directs.

91. Protection of cabin crew during flight

A cabin crew member shall be seated with seatbelt or, when provided, safety harness fastened during take-off and landing and whenever the PIC so directs.

92. Cabin crew training

(1) An operator shall ensure that a training programme for cabin crew members is completed by all persons before being assigned as cabin crew members.

(2) An operator shall establish and maintain a training programme for cabin crew members that is designed to ensure that persons who receive training acquire the competency to perform their assigned duties, and the operator shall include or make reference to a syllabus for the training programme in the company operations manual.

(3) The training programme shall include human factors principles.

PART V—RECORDS

93. Flight recorder records

An operator or where an aeroplane is leased, the lessee, shall ensure, to the extent possible, in the event that the aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records and, where necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with the Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2022.

PART VI—SECURITY

94. Security Programme

The authority shall ensure that each entity conducting general aviation operations, including corporate operator aviation operations, using an aeroplane with a maximum take-off mass greater than 5,700 kg, establishes, implements and maintains an approved written operator security programme that meets the requirements of the national civil aviation security programme of Uganda.

95. Reporting acts of unlawful interference

A PIC shall, following an act of unlawful interference submit a report to a designated local authority.

PART VII—GENERAL

96. Application for exemptions

(1) An operator may apply to the authority for an exemption from any of the provisions of these Regulations.

(2) A request for exemption shall be made in accordance with the requirements of these Regulations and shall be submitted and processed in a manner prescribed by the authority.

97. Reports of violation

(1) A person who knows of a violation of the Act, rules, regulations or order issued by the authority under these Regulations, shall report the violation to the authority.

(2) The authority shall determine the nature and type of any additional investigation or enforcement action that shall be taken in respect of any violation reported under subregulation (1).

98. Enforcement of directions

(1) A person who fails to comply with any direction given by the authority or by any authorised person under these Regulations shall be deemed, for the purposes of these Regulations, to have contravened these Regulations.

(2) The authority shall take enforcement action on any regulated entity that fails to comply with any provisions of these Regulations.

(3) An inspector of the authority holding a valid instrument of delegation shall take necessary action to preserve safety where an undesirable condition has been detected.

- (4) The action referred to in subregulation (2) may include—
- (a) in the case of a regulated entity, imposition of operating restrictions until such a time as the existing undesirable condition has been resolved; or
 - (b) in case of a licensed personnel, require that individual not to exercise the privileges of the licence until such a time that the undesirable condition has been resolved.

(5) In carrying out enforcement actions of subregulation (4), the inspectors of the authority shall invoke the powers with due care and act in good faith in the interest of preserving safety.

99. Aeronautical user fees

(1) The authority shall notify applicants of the fees to be charged in connection with the issue, validation, renewal, extension or variation of any licence, certificate, authorisation or such other document, including the issue of a copy or the undergoing of any examination, test, inspection or investigation or the grant of any permission or approval, required by, these Regulations.

(2) Upon an application being made in connection with which any fee is chargeable in accordance with subregulation (1), the applicant shall be required, before the application is entertained, to pay the fee so chargeable.

(3) Where payment of fees has been made and the application is withdrawn by the applicant or otherwise ceases to have effect or is rejected, the authority shall not refund the payment.

100. Application to Government and visiting forces

(1) These Regulations apply to aircraft, not being military aircraft, belonging to or exclusively employed in the service of the Government, and for the purposes of such application, the department or other authority for the time being responsible for management of the aircraft shall be deemed to be the operator of the aircraft, and in the

case of an aircraft belonging to the Government, to be the owner of the interest of the Government in the aircraft.

(2) Except as otherwise expressly provided, the naval, military and air force authorities and members of any visiting force and property held or used for the purpose of such a force shall be exempt from the provision of these Regulations to the same extent as if the visiting force formed part of the military force of the state.

101. Extra- territorial application

Except where the context otherwise requires, these Regulations—

- (a) apply, whether by express reference or otherwise, to an aircraft registered in Uganda, wherever the aircraft may be;
- (b) apply, whether by express reference or otherwise, to aircraft other than an aircraft in paragraph (a), to that aircraft when the aircraft is within Uganda;
- (c) prohibit, require or regulate the doing of anything by a person in or by any of the crew of, an aircraft registered in Uganda, to those persons and crew, wherever they may be; and
- (d) prohibit, require or regulate the doing of anything by a person, in relation to an aircraft registered in Uganda, where that person is a citizen of Uganda, apply to that person wherever he or she may be.

102. Offences and penalties

(1) A person who contravenes any provision of these Regulations commits an offence and is liable, on conviction, to have a licence, certificate, approval, authorisation, exemption or other document issued to that person revoked or suspended by the authority.

(2) Where any provision of these Regulations is contravened in relation to an aircraft, the operator and the PIC, if the operator or

the PIC is not the person who contravened the provision shall, without prejudice to the liability of any other person under these Regulations, be deemed for the purposes of these Regulations, to have contravened that provision unless the operator and the PIC prove that the contravention occurred without their consent or connivance and that due diligence was exercised to prevent the contravention.

(3) A person who contravenes any provision specified as an “A” provision in Schedule 4 to these Regulations commits an offence and is liable, on conviction, to a fine not exceeding fifty currency points for each offence or each flight or to imprisonment for a term not exceeding two years or both.

(4) A person who contravenes any provision specified as a “B” provision in Schedule 4 to these Regulations commits an offence and is liable on conviction to a fine not exceeding one hundred currency points for each offence or each flight or to imprisonment for a term not exceeding four years or both.

(5) A person who contravenes any provision of these Regulations not being a provision referred to in Schedule 4 to these Regulations, commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points and in the case of a second or subsequent conviction for the same offence to a fine not exceeding two hundred currency points.

(6) Where it is proved that an act or omission of any person, which would otherwise have been a contravention by that person of a provision of these Regulations, was due to any cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of that provision.

(7) A person who continuously commits offence under these regulations, is liable, on conviction, to a fine not exceeding fifty currency points, for each day of the contravention and the continuous contravention shall constitute a separate offence.

(8) Where an aircraft is involved in a contravention of a provision of these Regulations, and the contravention is by the owner or operator of the aircraft, the aircraft shall be subject to a lien in lieu of the penalty.

(9) Any aircraft that is subject to a lien under subregulation (8), may be seized by and placed in the custody of the authority.

(10) Subject to subregulation (9), the authority shall not seize an aircraft without the legal advice of the Attorney General.

(11) An aircraft which is seized by and placed in the custody of the authority, under subregulation (9), shall be released where—

- (a) the fine is paid;
- (b) a bond of an amount to be prescribed by the authority is deposited with the authority, conditioned on the payment of the fine; or
- (c) a competent court makes an order to that effect.

103. Revocation of S.I. No. 36 of 2020, savings and transitional

(1) The Civil Aviation (Operation of Aircraft) (General Aviation Aeroplanes) Regulations, 2020 are revoked.

(2) A licence, certificate, an authorisation, exemption or approval granted by the authority under the regulations revoked by subregulation (1) and which is in force immediately before the commencement of these Regulations, shall have effect and shall continue in force as if granted under these Regulations, until it expires or is cancelled by the authority.

(3) Notwithstanding the continuance of a licence, certificate, an authorisation, exemption or approval, under subregulation (2), a person who, at the commencement of these Regulations is carrying out any act, duty or operation affected by these Regulations shall, within six months from the commencement of these Regulations, or within such longer period as the Minister may, by notice in the Gazette prescribe, comply with the requirements of these Regulations.

(4) (4) Notwithstanding regulation 102, a person granted a licence, certificate, an authorisation, exemption or approval continued under subregulation (3) who does not comply with the requirements of these Regulations within the time prescribed under subregulation (3), shall have authorisation, instruction, exemption or approval cancelled by the authority.

SCHEDULES

SCHEDULE 1

regulation 3

CURRENCY POINT

One currency point is equivalent to twenty thousand shillings.

SCHEDULE 2

regulation 8(2)

GENERAL AVIATION SPECIFIC APPROVALS

PURPOSE AND SCOPE

Specific approvals shall have a standardised format which contains the minimum information required in the specific approval template.

Note: When the operations to be conducted require a specific approval, a copy of the document(s) needs to be carried.



SPECIFIC APPROVAL

UGANDA CIVIL AVIATION AUTHORITY¹ and CONTACT DETAILS¹

Address _____ Signature: _____

_____ Date²: _____

Telephone: _____ Fax: _____

_____ Email: _____

OWNER/OPERATOR

Name³: _____ Address: _____

Telephone: _____ Fax: _____

Email: _____

| Aircraft model ⁴ and registration marks: | | | | |
|--|--------------------------|--------------------------|--|---------|
| SPECIFIC APPROVAL | YES | NO | DESCRIPTION ⁵ | REMARKS |
| Low visibility operations | | | | |
| Approach and landing | <input type="checkbox"/> | <input type="checkbox"/> | CAT ⁶ : __RVR: ____ m DH: _____ ft | |
| Take-off | <input type="checkbox"/> | <input type="checkbox"/> | RVR ⁷ : _____ m ⁸ | |
| Operational credit(s) | <input type="checkbox"/> | <input type="checkbox"/> | | |
| RVSM | <input type="checkbox"/> | <input type="checkbox"/> | | |
| AR navigation specifications for PBN operations ⁹ | <input type="checkbox"/> | <input type="checkbox"/> | | |
| EFB ¹⁰ | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Other ¹¹ | <input type="checkbox"/> | <input type="checkbox"/> | | |

Notes.—

1. Civil Aviation Authority name and contact details, including the telephone country code and email if available.
2. Issuance date of the specific approval (dd-mm-yyyy) and signature of the authority representative.
3. Owner or operator's name and address.
4. Insert the aeroplane make, model and series, or master series, if a series has been designated. The CAST/ICAO taxonomy is available at: <http://www.intlaviationstandards.org/>.
5. List in this column the most permissive criteria for each specific approval (with appropriate criteria).
6. Insert the applicable precision approach category (CAT II, III). Insert the minimum RVR in meters and decision height in feet. One line is used per listed approach category.

7. *Insert the approved minimum take-off RVR in meters, or the equivalent horizontal visibility if RVR is not used. One line per approval may be used if different approvals are granted.*
8. *List the airborne capabilities (i.e. automatic landing, HUD, EVS, SVS, CVS) and associated operational credit(s) granted.*
9. *Performance-based navigation (PBN): one line is used for each PBN AR navigation specification approval (e.g. RNP AR APCH), with appropriate limitations listed in the “Description” column.*
10. *List the EFB functions used for the safe operation of aeroplanes and any applicable limitations*
11. *Other specific approvals or data can be entered here, using one line (or one multi-line block) per approval (e.g. specific approach operations approval).*

SCHEDULE 3

regulation 51(2)

COMPANY OPERATIONS MANUAL

1. The following is the suggested content of a company operations manual.
2. It may be issued in separate parts corresponding to specific aspects of an operation. It should include the instructions and information necessary to enable the personnel concerned to perform their duties safely and shall contain at least the following information—
 - (a) table of contents;
 - (b) amendment control page and list of effective pages, unless the entire document is reissued with each amendment and the document has an effective date on it;
 - (c) duties, responsibilities and succession of management and operating personnel;
 - (d) operator safety management system;
 - (e) operational control system;
 - (f) MEL procedures, where applicable;
 - (g) normal flight operations;
 - (h) standard operating procedures (SOPs);
 - (i) weather limitations;
 - (j) flight and duty time limitations;
 - (k) emergency operations;
 - (l) accident or incident considerations;
 - (m) personnel qualifications and training;

- (n) record keeping;
- (o) a description of the maintenance control system;
- (p) security procedures, where applicable;
- (q) performance operating limitations;
- (r) use or protection of FDR or CVR records, where applicable;
- (s) handling of dangerous goods; and
- (t) use of head-up displays (HUD) or enhanced vision systems (EVS).

SCHEDULE 4

regulation 102 (3), (4), (5)

OFFENCES AND PENALTIES BY CATEGORY

| REGU- LATION | TITLE | CATEGORY OF OFFENCE |
|-----------------|---|------------------------|
| 5 | Compliance with laws, regulations and procedures | B |
| 6 | Dangerous goods | B |
| 7 | Use of psychoactive substances | B |
| 8 | Specific approval | B |
| 9 | Operating facilities | A |
| 10 | General operational management operating instructions | A |
| 11 | Aerodrome operating minimum | A |
| 12 | Passengers | A |
| 13 | Flight preparation | A |
| 14 | Flight planning | A |
| 15 | Meteorological conditions for VFR flights | B |
| 16 | IFR flights | B |
| 17 | Flight in known icing conditions | A |
| 18 | Destination alternate aerodromes | A |
| 19 | Fuel and oil requirements | A |
| 20 | Refuelling with passengers on board | B |
| 21 | Oxygen supply | B |
| 22 | In-flight procedures for aerodrome operating minima | A |
| 23 | Meteorological and operational observations by pilots | A |

| | | |
|----|--|---|
| 24 | Hazardous flight conditions | A |
| 25 | Flight crew members at duty stations | A |
| 26 | Aeroplane operating procedures for landing performance | A |
| 27 | Use of oxygen by flight crew members | B |
| 28 | Safeguarding of cabin crew and passengers in the event of loss of pressurisation | B |
| 29 | In-flight fuel management | A |
| 30 | Instrument approach procedures | A |
| 31 | Duties of PIC | A |
| 32 | Cabin baggage to be securely stowed | A |
| 34 | Owner's continuing airworthiness responsibilities | B |
| 35 | Continuing airworthiness records | B |
| 36 | Modifications and repairs | B |
| 37 | Maintenance release | B |
| 38 | Composition of flight crew | B |
| 39 | Qualifications of crew members | B |
| 40 | Flight manual | B |
| 41 | Journey logbook | B |
| 42 | Records of emergency and survival equipment | B |
| 43 | Security of aeroplanes | A |
| 44 | Reporting acts of unlawful interference | B |
| 47 | Compliance with laws, regulations and procedures | A |
| 48 | Safety management | A |
| 49 | Operating facilities | A |

| | | |
|----|---|---|
| 50 | Operational management | A |
| 51 | Operations manual | B |
| 52 | General operating instructions | A |
| 53 | In-flight simulation of emergency situations | B |
| 54 | Checklists | B |
| 55 | Minimum flight altitudes | B |
| 56 | Aerodrome operating minima | A |
| 57 | Fatigue management programme | B |
| 59 | Flight preparation | A |
| 60 | Operational flight planning | A |
| 61 | Alternate aerodromes | A |
| 62 | Fuel requirements | B |
| 63 | Additional requirements for operations beyond sixty minutes to en-route alternate aerodrome | A |
| 64 | Refuelling with passengers on board | B |
| 65 | Oxygen supply | B |
| 66 | Use of oxygen | B |
| 67 | In flight procedures instrument approaches | A |
| 68 | Aeroplane operating procedures for noise abatement | B |
| 69 | Aeroplane operating procedures for rates of climb and descent | A |
| 70 | Aeroplane operating procedures for landing performance | A |
| 71 | Duties of PIC | B |
| 72 | Securing cabin baggage for take-off and landing | A |
| 74 | Performance limitations of aeroplanes above 5700kg certificated after 13th June, 1960 and 2 nd March, 2004 and aeroplanes certificated after 2 nd March, 2004 | B |

| | | |
|-----|--|---|
| 75 | Mass limitations | B |
| 76 | Operator's continuing airworthiness responsibilities | B |
| 77 | Continuing airworthiness information | B |
| 78 | Maintenance control manual | B |
| 79 | Maintenance programme | B |
| 80 | Maintenance release | B |
| 81 | Composition of the Flight Crew | B |
| 82 | Flight engineer | A |
| 83 | Flight crew member emergency duties | A |
| 84 | Flight crew member training programme | B |
| 85 | Flight crew member qualifications | A |
| 86 | Recent experience | A |
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| 101 | Extra- territorial application of these Regulations | B |

Cross References

Civil Aviation (Aircraft Accident and Incident Investigations) Regulations, 2022 S.I. No. 66 of 2022

Civil Aviation (Airworthiness of Aircraft) Regulations, 2022 S.I. No. 77 of 2022

Civil Aviation (Approved Training Organisations) Regulations, 2022 S.I. No. 79 of 2022

Civil Aviation (Instruments and Equipment) Regulations, 2022 S.I. No. 75 of 2022

Civil Aviation (Personnel Licensing) Regulations, 2022 S.I. No. 89 of 2022

Civil Aviation (Safety Management) Regulations, 2022 S.I. No. 91 of 2022

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Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 92

THE CIVIL AVIATION (SECURITY) REGULATIONS, 2022

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94. Refund of penalty

Regulation

PART X – REVOCATION AND SAVINGS

95. Revocation of S.I No. 24 of 2017 and savings

SCHEDULE

STATUTORY INSTRUMENTS

2022 No. 92

The Civil Aviation (Security) Regulations, 2022.

*(Under sections 34(2), 50 and 61 of the Civil Aviation Authority Act,
Cap 354)*

IN EXERCISE of the powers conferred upon the Minister by sections 34(2), 50 and 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 11th day of July, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Security) Regulations, 2022.

2. Application of Regulations

- (1) These Regulations apply to —
 - (a) all aerodromes;
 - (b) general aviation;
 - (c) civil aviation operations;
 - (d) persons at civil airports;
 - (e) persons working in the aviation industry;
 - (f) persons who occupy land or buildings forming part of an airport; and
 - (g) persons on land adjoining or adjacent to or within the vicinity of airports or air navigation installations which do not form part of an airport.

(2) Notwithstanding the generality of subregulation (1), these Regulations apply to –

- (a) operators and owners of civil airports;
- (b) operators and owners of aircraft registered in Uganda or aircraft registered in another state and operating in Uganda;
- (c) managers of air navigation installations;
- (d) persons permitted to have access to security restricted areas at an airport;
- (e) persons who offer cargo and mail for transport by air; and
- (f) any person whose conduct amounts to an act of unlawful interference or endangers aviation safety.

(3) Nothing in these Regulations applies to or affects—

- (a) a state aircraft; or
- (b) military or police aircraft in Uganda.

(4) These Regulations shall be reviewed and updated to take into consideration International Civil Aviation Organisation (ICAO) Annex 17 provisions and their amendments, or to address any new and emerging threat to civil aviation or other relevant reasons.

(5) There has been established a policy and procedures to identify and notify International Civil Aviation Organisation of differences between ICAO Annex 17 Standards and the national aviation security policies and requirements.

3. Objective of Regulations

(1) The objective of these Regulations is —

- (a) to safeguard and enhance aviation security against acts of violence or unlawful interference by providing for the protection of—

- (i) aircraft used for civil aviation and of persons and property on board such aircraft;
 - (ii) airports, persons and property at airports; and
 - (iii) air navigation installations and facilities located at the airport and off-airports; and
- (b) to regulate the conduct of persons at airports and persons on board aircraft for the purposes of aviation security.

4. Protection of sensitive aviation security information

Uganda shall ensure appropriate protection of sensitive aviation security information and any other security information.

5. International cooperation

(1) A State that requests for additional security measures for a specific flight(s) shall ensure appropriate consultation and shall give consideration to alternative measures of Uganda that are equivalent to additional security measures requested for.

(2) Uganda shall ensure that requests from other contracting States for additional security measures in respect of a specific flight by operators of such other States are met, as far as may be practicable.

6. Interpretation

In these Regulations, unless the context requires otherwise—

“Act” means the Civil Aviation Authority Act, Cap 354;

“acts of unlawful interference” means an act or attempted act to jeopardise the safety of civil aviation and air transport, including but not limited to—

- (a) unlawful seizure of an aircraft in flight or on the ground;

- (b) destroying an aircraft in service or causing damage to the aircraft which renders it incapable of flight or which is likely to endanger its safety in flight;
- (c) hostage taking on board an aircraft or at an airport;
- (d) forcible intrusion on board an aircraft at an airport or on the premises of an aeronautical facility;
- (e) introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes;
- (f) use of an aircraft in service for the purpose of causing death, serious bodily injury, or serious damage to property or the environment;
- (g) unauthorised possession at an airport, or unauthorised introduction on board an aircraft, of a weapon or hazardous device or material;
- (h) destroying or damaging air navigation facilities or interfering with their operation, if any such act is likely to endanger the safety of aircraft in flight;
- (i) violence against a person on board an aircraft in flight; if that act is likely to endanger the safety of that aircraft;
- (j) communicating information which is known to be false, thereby endangering the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public at an airport or on the premises of a civil aviation facility;
- (k) unlawfully and intentionally using any device, substance or weapon—

- (i) to perform an act of violence against a person at an airport serving civil aviation which causes or is likely to cause serious injury or death;
- (ii) to destroy or seriously damage the facilities of an airport serving civil aviation or an aircraft not in service located at the airport or disrupting the services of the airport, if that act endangers or is likely to endanger safety at that airport;

“aircraft security check” means an inspection of the interior of an aircraft to which passengers may have had access and an inspection of the hold for the purposes of discovering suspicious objects, weapons, explosives or other dangerous devices, articles and substances;

“aircraft security search” means a thorough inspection of the interior and exterior of the aircraft for the purpose of discovering suspicious objects, weapons, explosives or other dangerous devices, articles or substances;

“airport” means a defined area of land or water, including any buildings, installations and equipment, intended to be used either wholly or in part for arrival, departure and surface movement of aircraft and includes an aerodrome;

“airport operator” includes an individual, organisation or enterprise, however designated, for the time being responsible for the administration and operation of an airport;

“airport security permit” means a permit issued under regulation 28(3);

“airside” means the movement area of an airport, adjacent terrain and buildings or their portions, access to which is controlled;

“authorised economic operator” means a party involved in the international movement of goods of whatever function that has been approved by or on behalf of a national customs administration as complying with World Customs Organisation or equivalent supply chain security standards and manufacturers, importers, exporters, brokers, carriers, consolidators, intermediaries, ports, airports, terminal operators, integrated operators, warehouses, distributors and freight forwarders;

“authorised person” means a person designated by the authority as an authorised person to implement and enforce these Regulations;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Civil Aviation Authority Act;

“aviation security” means safeguarding civil aviation against acts of unlawful interference through a combination of measures and human and material resources;

“aviation security officer” means a person employed by an operator or other authorised entity or agency to carry out security controls;

“background check” means a check of a person’s identity and previous experience, including criminal history and any other security related information relevant for assessing the person’s suitability, in accordance with national legislation;

“behaviour detection” within an aviation security environment, means the application of techniques involving the recognition of behavioral characteristics, including but not limited to physiological or gestural signs indicative of anomalous behavior, to identify persons who may pose a threat to civil aviation;

“cargo” means any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage;

“catering stores” means all items, other than catering supplies, associated with passenger in-flight services, including newspapers, magazines, headphones, audio and video tapes, pillows, blankets and amenity kits;

“catering supplies” means all food, beverages, dry stores and associated equipment used in air transport;

“certification” means a formal evaluation and confirmation by or on behalf of the authority that a person possesses the necessary competencies to perform assigned functions to an acceptable level as defined by the authority;

“civil aviation” includes—

(a) commercial air transport operations; and

(b) general aviation operations;

“COMAIL” means commercial air transport operator company mail, shipped within its network of stations;

“COMAT” means commercial air transport operator company materials, shipped within a network of stations;

“commercial air transport operations” means aircraft operations involving the transport of passengers, cargo or mail for remuneration or hire;

“competent authority” means the ministry responsible for immigration;

“corporate aviation” means the non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot employed to fly the aircraft;

“currency point” has the value assigned to it in the Schedule to these Regulations;

“disruptive passenger” means a passenger who fails to comply with the rules of conduct at an airport or on board an aircraft or to follow the instructions of the airport staff or aircraft crew members and thereby disturbs the good order and discipline at an airport or on board an aircraft;

“facilitation” means the efficient management of the necessary control process, with the objective of expediting the clearance of persons or goods and preventing unnecessary operational delays;

“aircraft operator documents” means airway bills and consignment notes, passenger tickets and boarding passes, bank and agent settlement plan documents, excess baggage tickets, miscellaneous charges orders, damage and irregularity reports, baggage and cargo labels, time tables, weight and balance documents for use by aircraft operators;

“general aviation operation” means an aircraft operation other than a commercial air transport operation or an aerial work operation;

“Ground Handling Service Provider” means a provider of services to airport users at the airport that include baggage handling, freight and mail handling, the physical handling of freight and mail, whether incoming, outgoing or being transferred between the air terminal and the aircraft, fuel and oil handling and ramp handling;

“high-risk cargo or mail” means cargo or mail which is deemed to pose a threat to civil aviation as a result of specific intelligence or shows anomalies or signs of tampering which give rise to suspicion;

“Human factors principles” mean principles which apply to design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

“human performance” means human capabilities and limitations which have an impact on the safety, security and efficiency of aeronautical operations;

“In-flight security officer” means a person authorised by the government of the State of the operator and the government of the State of registration to be deployed on an aircraft with the purpose of protecting that aircraft and its occupants against acts of unlawful interference but excludes persons employed to provide exclusive personal protection for one or more specific people travelling on the aircraft, such as personal bodyguards;

“known consignor” means a consignor who originates cargo or mail for its own account and whose procedures meet common security rules and standards sufficient to allow the carriage of cargo or mail on any aircraft;

“known stores” means catering supplies and stores delivered to an aircraft operator and that have been subjected to appropriate security controls;

“landside” means the area of an airport and buildings to which both travelling passengers and the non-traveling public have unrestricted access;

“mail” means dispatches of correspondence and other items tendered by and intended for delivery to postal services in accordance with the rules of the Universal Postal Union;

“Minister” means the Minister responsible for civil aviation;

“operator” includes an airport operator, an aircraft operator, a regulated agent and a catering operator;

“prohibited items or restricted articles” means articles which, in the specific context of aviation security are defined as articles, devices, or substances which may be used to commit an act of unlawful interference against civil aviation or which may endanger the safety of the aircraft and its occupants or installations or the public;

“regulated agent” means an agent, freight forwarder or other entity who conducts business with an operator and provides security controls that are accepted or required by the appropriate authority for cargo or mail;

“sabotage” means an act or omission, intended to cause malicious or wanton destruction of property, endangering or resulting in unlawful interference with civil aviation and its facilities;

“screening” means the application of technical or other means intended to identify or detect weapons, explosives or other

dangerous devices, articles or substances which may be used to commit an act of unlawful interference;

“security audit” means an in-depth compliance examination of all aspects of the implementation of the National Civil Aviation Security Programme;

“security control” is a means by which the introduction of weapons, explosives or other dangerous devices, articles or substances which may be used to commit an act of unlawful interference can be prevented;

“security culture” means a set of security-related norms, values, attitudes and assumptions that are inherent in the daily operation of an organisation and are reflected by the actions and behaviours of all entities and personnel within the organisation;

“security inspection” means announced or unannounced examination of the effectiveness of the implementation of specific security measures;

“security restricted area” means airside areas of an airport which are identified as priority risk areas where, in addition to access control, other security controls are applied;

“security test” means a covert or overt trial of an aviation security measure which simulates an attempt to commit an unlawful act;

“single window” means a facility that allows parties involved in trade and transport to lodge standardised information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements and where information is electronic then individual data elements should only be submitted once;

“supply chain assets” means cargo and mail, facilities, equipment, information and personnel;

“technical instructions” means the ICAO Technical Instructions for Safe Transportation of Dangerous Goods by Air, Doc.9284;

“transfer cargo and mail” means cargo and mail departing on an aircraft other than that on which it arrived;

“travel document” means a passport or other official document of identity issued by a State or organisation, which may be used by the rightful holder for international travel;

“unidentified baggage” means baggage at an airport, with or without a baggage tag which is not picked by or identified with a passenger;

“unknown stores” means supplies and stores that have not been subjected to appropriate security controls;

“unpredictability” means the implementation of security controls in order to increase their deterrent effect and their efficiency, by applying them at irregular frequencies, different locations or with varying means, in accordance with a defined framework.

PART II—NATIONAL ORGANISATION AND APPROPRIATE AUTHORITY

7. Functions of authority in relation to aviation security

(1) The functions of the authority in relation to aviation security are to—

- (a) regulate aviation security in Uganda;
- (b) establish, implement and maintain the National Civil Aviation Security Programme, the National Civil Aviation

Security Quality Control Programme, the National Civil Aviation Security Training Programme, including Civil Aviation Security Certification System;

- (c) regulate the security operations of airports, aircraft, air traffic service providers, regulated agents and ground handling service providers, catering operators, general aviation operators, cargo and mail operators, aircraft cleaning operators and other operators as the case may be, for the purpose of—
 - (i) protecting passengers, crew members, ground personnel, the general public, aircraft, airport and other aviation facilities;
 - (ii) preventing unlawful interference against civil aviation; and
 - (iii) ensuring that appropriate action is taken when an act of unlawful interference occurs or is likely to occur; and
 - (d) define and allocate tasks and coordinate activities under the National Civil Aviation Security Programme between ministries, departments, agencies, airports, aircraft operators and air traffic services providers and other organisations responsible for the various aspects of aviation security.
- (2) The authority shall, in respect of an operator—
- (a) ensure that periodic vulnerability assessments are conducted at airports engaged in international and domestic operations, ensuring coordination among relevant departments, agencies, including appropriate law enforcement and intelligence authorities, and other entities and such vulnerability assessments shall be used to inform risk assessments and security improvements;

- (b) establish and implement procedures to share, as appropriate, with relevant airport operators, aircraft operators, air traffic service providers or other entities concerned, in a practical and timely manner, relevant information to assist them to conduct effective security risk assessments relating to their operations for the purpose of protecting civil aviation against possible threat, including but not limited to, person borne improvised explosive device, improvised explosive devices in cargo and mail, insider threat and Man Portable Air Defence Systems;
- (c) conduct security inspections and audits of security measures;
- (d) conduct security tests of security controls to assess their effectiveness;
- (e) review and approve or accept security programs in accordance with these Regulations and the National Civil Aviation Security requirements to verify the effective implementation of the provisions provided in the operator's security program and the national legislation;
- (f) conduct on - site inspections at the premises of an operator or at a station operated by the operator in the case of an aircraft operator, to validate the provisions stated in the operator security program prior to approval or acceptance of the security program.
- (g) conduct security investigations and enforce resolutions of any security concerns;
- (h) avail to the airport, aircraft, catering operators and air traffic service providers operating in the territory of Uganda, a written version of the appropriate parts of the National Civil Aviation Security Programme and relevant information or guidelines enabling them to meet the requirements of the National Civil Aviation Security Programme;

- (i) require operators not to accept cargo or mail for carriage on an aircraft engaged in commercial air operations unless the application of screening or other security controls is confirmed and accounted for by a regulated agent, known consignor, or an entity that is approved by the authority;
- (j) require an operator to subject to screening cargo and mail which cannot be confirmed and accounted for by a regulated agent, a known consignor or an entity that is approved by the authority;
- (k) require aircraft operators to subject transfer cargo and mail to appropriate security controls prior to their being loaded onto an aircraft departing from the territory of Uganda;
- (l) require catering operators to subject catering, stores and supplies intended for carriage on commercial flights to appropriate security controls, which may include a supply chain security process or screening, and protect them until loaded onto the aircraft;
- (l) require an operator, responsible for implementation of security measures and procedures to consider the use of advanced security equipment, when investing in new equipment to achieve civil aviation security objectives;
- (m) require an airport operator to establish and maintain contingency plans and—
 - (i) conduct partial and full scale exercises to test the effectiveness of the plans on a regular basis as prescribed in regulation 27 (2) (l) and (m);
 - (ii) conduct an evaluation following an exercise to test the plans to identify deficiencies and remedy weaknesses in response mechanisms; and
- (n) require that supporting resources and facilities required by the aviation security services are made available at each

airport serving civil aviation to safeguard civil aviation against acts of unlawful interference.

- (3) The authority shall—
 - (a) share threat information that applies to the aviation security interests in accordance with the laws of Uganda; and
 - (b) subject to paragraph (a), consider and share threat information of aviation interests with other States as deemed necessary for the purpose of protecting civil aviation against acts of unlawful interference.
- (4) The authority shall—
 - (a) conduct certification of aviation security screeners and instructors;
 - (b) keep under constant review, the level and nature of threat to civil aviation within Ugandan territory and air space above Uganda and shall establish and implement policies and procedures to adjust relevant elements of the National Civil Aviation Security Programme accordingly, based upon a regular security risk assessment carried out or conducted by the relevant national authorities;
 - (c) share threat information that applies to aviation security interests of other States in accordance with the laws of Uganda as the authority deems necessary for the purpose of protecting civil aviation against acts of unlawful interference;
 - (d) where necessary, engage in collaborative arrangements with other States in order to increase the sustainability of the aviation security system by avoiding unnecessary duplication of security controls and the arrangements shall be based on verification of equivalence of the security outcome ensured by the application of effective security controls at the points of origin;

- (e) establish and implement appropriate mechanisms to confirm that transfer cargo and mail entering into Uganda from other States has been subjected to appropriate security controls;
 - (f) ensure appropriate protection of sensitive aviation security information; and
 - (g) ensure that a clause related to aviation security is included in each Bilateral Air Services Agreement on air transport, taking into account the model clause developed by International Civil Aviation Organisation.
- (5) The authority, in respect of other States—
- (a) shall co-operate in the development and exchange of information on National Civil Aviation Security Programmes in accordance with the laws of Uganda;
 - (b) may, subject to paragraph (a), consider requests by other States to share or exchange information on the development of security programmes including National Civil Aviation Security Programme, National Civil Aviation Training Programme and National Civil Aviation Quality Control Programme, as well as provision of a written version of the National Civil Aviation Security Programme as appropriate;
 - (c) shall establish and implement suitable protection and handling procedures for aviation security information shared or aviation security information that affects the security interests of other States, in order to ensure that inappropriate use or disclosure of such information is avoided; and
 - (d) may share, as appropriate and consistent with the sovereignty of Uganda, the results of an audit carried out by International Civil Aviation Organisation and the corrective actions taken.

- (6) The authority shall ensure that—
- (a) all aviation security training programmes for personnel with responsibilities under the national civil aviation security programme include an assessment of competencies to be acquired and maintained for initial and recurrent training;
 - (b) the provisions indicated under regulation 13(4)(d) regarding background checks are implemented;
 - (c) the provisions indicated under regulation 13(4)(e) regarding verifying implementation of security measures outsourced to external service providers are implemented;
 - (d) the use of randomness and unpredictability in the implementation of security measures, as appropriate is considered;
 - (e) the use of appropriate screening methods are capable of detecting the presence of explosives and explosive devices carried by a person other than a passenger on himself or herself or in his or her items carried and where these methods are not applied continuously, they are used in an unpredictable manner;
 - (f) appropriate screening methods that are capable of detecting the presence of explosives and explosive devices in hold baggage are used;
 - (g) a functional and effective airport security committee is established at each airport that serves civil aviation to assist the coordinating authority in its role of coordinating the implementation of security controls, measures and procedures as specified in the Airport Security Programme;
 - (h) an aircraft operator establishes, implements and maintains measures for reconciliation of originating passenger hold baggage and authorisation for carriage of hold baggage prior to the departure of the aircraft; and

- (i) security controls and procedures are re-evaluated following an act of unlawful interference, and in a timely fashion take action necessary to remedy weaknesses so as to prevent recurrence.

(7) The authority shall require entities that are involved with or responsible for the implementation of various aspects of the National Civil Aviation Security Programme to promote, develop and implement an internal security culture policy.

(8) The security culture elements in subregulation (7) shall include—

- (a) reporting, incident response systems and measures of their effectiveness;
- (b) initial and recurrent security awareness training;
- (c) promotion of the security culture by leadership;
- (d) security awareness practical campaigns;
- (e) vigilance and understanding the threat; and
- (f) information security.

(9) The authority shall require and ensure that an airport operator, an aircraft operator or a regulated agent establishes and maintains initial and recurrent dangerous goods training programmes and complies with the International Civil Aviation Organisation Technical Instructions for the Safe Transportation of Dangerous Goods by Air, Doc. 9284 and any amendments which may be specified during a period of applicability of an edition.

8. Power to access and inspect airport, aircraft and operator's premises

The authority shall have free and unobstructed access at all times to an airport, an aircraft operating from or within Uganda, an aircraft registered in Uganda while operating in other States, wherever they

may be, and the premises of an operator within Uganda, for the purpose of inspecting security operations or to carry out security inspections, vulnerability assessments, security audits, testing functions and investigation of incidents and non-conformances.

9. Power of authority to issue orders, circulars, directives, rules and instructions

The authority may make and issue other relevant orders, circulars, directives, rules and instructions or any other specific operating requirements that contain details to ensure the consistent application of aviation security measures.

10. Authorised persons

(1) The authority shall designate in writing qualified persons, by name or by title for the purpose of implementing and enforcing these Regulations.

(2) The designation under subregulation (1) shall specify the functions and limits of the operation.

PART III—SECURITY PROGRAMMES AND COMMITTEES

11. National Civil Aviation Security Programme

(1) There is established the National Civil Aviation Security Programme approved by the authority.

(2) The authority shall ensure that the National Civil Aviation Security Programme is implemented and maintained to safeguard civil aviation against acts of unlawful interference through practices and procedures which take into account the safety, regularity and efficiency of flights.

(3) The authority shall make available to aerodromes and aircraft operators operating in Uganda and to other operators, air traffic service providers and entities concerned with civil aviation, a written version of the appropriate part of the National Civil Aviation

Security Programme and relevant information or guidelines that enable them to meet the requirements of the National Civil Aviation Security Programme.

(4) Without limiting the generality of subregulation(1), the National Civil Aviation Security Programme shall include the following matters—

- (a) the allocation of responsibilities for implementation of the programme;
- (b) the co-ordination, facilitation and communications under the programme;
- (c) the protection of airports, aircraft and air navigation facilities;
- (d) the co-ordination of landside security measures between relevant departments, agencies, other organisations of the State, and other entities, and the identification and allocation of appropriate responsibilities to those entities in the National Civil Aviation Security Programme;
- (e) the screening and other security controls for persons other than passengers, together with items carried prior to entry into airport Security Restricted Areas serving civil aviation operations;
- (f) the security control of persons and items being placed on board aircraft;
- (g) security equipment;
- (h) aviation security personnel selection criteria, training and certification;
- (i) the management of response to acts of unlawful interference;
- (j) the evaluation of effectiveness of the Programme;
- (k) the adjustment of the Programme and contingency plans;

- (l) the financing of security;
- (m) the protection and handling procedures for security information shared by other States; and
- (n) processes for the reporting of information concerning incidents of acts of unlawful interference, taking into account the measures for protection of sensitive aviation security information.

(5) The National Civil Aviation Security Programme shall be reviewed and updated when the need arises and after an act of unlawful interference, a security exercise or at least once every two years.

(6) The reviewed Programme shall be approved by the Director General of the authority prior to implementation.

12. National Civil Aviation Security Committee

(1) There is established the National Civil Aviation Security Committee.

(2) The functions of the National Civil Aviation Security Committee are to —

- (a) advise on aviation security measures necessary to meet threats to aviation;
- (b) keep the implementation of aviation security measures under constant review and make recommendations for changes to these measures in response to new threat information, developments in aviation security technology and techniques and other factors;
- (c) advise and ensure the coordination of aviation security measures among ministries, departments, agencies, airports and aircraft operators, air traffic service providers and other entities concerned with or responsible for the implementation of various aspects of the National Civil Aviation Security Programme, subject to the form and extent of threats;

- (d) propose new aviation security policies, regulations or amendments;
- (e) promote security considerations in the design of new airports or the expansion of existing facilities;
- (f) review recommendations made by airport security committees and other relevant committees;
- (g) consider ways to cooperate with international organisations and other States so as to achieve common minimum aviation security standards that enhance the security of civil aviation as a whole;
- (h) recommend and review the effectiveness of security measures and procedures; and
- (i) coordinate security activities of the Air Navigation Service Providers.

(3) The members of the National Civil Aviation Security Committee shall be appointed by the Minister and shall consist of persons from ministries, departments, agencies, airports and aircraft operators and other related entities specified in subregulation (4).

(4) Without limiting the generality of subregulation(2), the Minister shall, in appointing members of the National Civil Aviation Security Committee, ensure that the committee comprises at least one member from each of the following ministries, departments, agencies—

- (a) the authority;
- (b) the Chairperson of the National Air Transport Facilitation Committee or his or her representative;
- (c) the airport operator;
- (d) the Ministry responsible for security;
- (e) the Ministry responsible for Internal Affairs;

- (f) the Ministry responsible for civil aviation;
- (g) State intelligence organisations;
- (h) the Uganda Police Force;
- (i) the Uganda Peoples Defence Forces;
- (j) the department responsible for immigration;
- (k) the chairperson of associations of domestic or local and international scheduled airlines;
- (l) the national regulatory agency responsible for communications;
- (m) the department responsible for customs;
- (n) the Ministry responsible for foreign affairs;
- (o) the Ministry responsible for health;
- (p) Air traffic service providers; and
- (q) chairperson airline operators' committee.

(5) A member of the National Civil Aviation Security Committee shall hold office on terms and conditions specified in his or her instrument of appointment.

(6) A member of the National Civil Aviation Security Committee and any other person invited to attend a meeting of the National Civil Aviation Security Committee shall be paid such sitting and other allowances as the authority may determine.

(7) The Director General of the authority shall be the Chairperson of the Committee, and shall ensure that the committee is functional and effective.

(8) The National Civil Aviation Security Committee may invite any person to attend and take part in the proceedings of the

Committee and that person may participate in any discussion at the meeting, but shall not have a right to vote at that meeting.

(9) The National Civil Aviation Security Committee shall meet for the discharge of its functions as often as is necessary, at a time and place specified by the Chairperson and in any case, not less than twice a year.

(10) Subject to these Regulations, the National Civil Aviation Security Committee shall regulate the procedure for its meetings.

13. National Civil Aviation Security Quality Control Programme and Operator Internal Quality Control Programme

(1) There is established a National Civil Aviation Security Quality Control Programme approved by the authority.

(2) The National Civil Aviation Security Quality Control Programme shall be implemented and maintained to determine and monitor compliance with and validate the effectiveness of the National Civil Aviation Security Programme through audits, inspections and tests.

(3) The National Quality Control Programme shall apply to all relevant aviation security entities and stakeholders to include but not limited to national and foreign aircraft operators and handling companies, cargo handlers, regulated agents and known consignors, and catering companies involved in the performance of security controls in Uganda and provide for quality control measures including screening and access control.

(4) The National Civil Aviation Security Quality Control Programme shall require that—

- (a) all persons who implement security controls are verifiably trained and possess all competencies required to carry out their duties;

- (b) persons who carry out screening operations are certified according to the requirements of the National Civil Aviation Security Programme to ensure that performance standards are consistently and reliably achieved;
- (c) background checks are completed in respect of persons who implement security controls, persons other than passengers granted unescorted access to security restricted areas of the airport and persons with access to sensitive aviation security information prior to their taking up these duties or accessing such areas or information;
- (d) background checks in paragraph (c) shall at a minimum include criminal record checks, disqualification criteria and record keeping;
- (e) recurrent or renewal background checks are applied to a person at intervals defined by the authority;
- (f) persons found unsuitable by any background check are immediately denied the ability to implement security controls, unescorted access to security restricted areas and access to sensitive aviation security information;
- (g) each entity responsible for the implementation of relevant elements of the National Civil Aviation Security Programme periodically verifies that the implementation of security measures outsourced to external service providers is in compliance with the entity's security programme;
- (h) acts of unlawful interference are investigated; and
- (i) the review and re-evaluation of security measure and procedures immediately following an act of unlawful interference.

(5) The authority shall in the implementation of the National Civil Aviation Security Quality Control Programme, ensure that —

- (a) the personnel who carry out security audits, tests and inspections are trained to appropriate standards for those tasks in accordance with the National Civil Aviation Security Programme;
- (b) the personnel who carry out security audits, tests and inspections are afforded the necessary authority to obtain information to carry out those tasks and to enforce corrective actions;
- (c) security audits, tests and inspections are conducted on a regular basis, to verify compliance with the National Civil Aviation Security Programme and to provide for the rapid and effective rectification of any deficiencies;
- (d) the priorities and frequency of these quality control oversight activities shall be determined on the basis of risk assessments carried out by the relevant authorities;
- (e) audits, inspections and tests are carried out for purposes of determining and monitoring compliance with and validating the effectiveness of the National Civil Aviation Security Programme;
- (f) it supplements the National Civil Aviation Security Quality Control Programme by establishing a confidential reporting system for analysing security information provided by sources including passengers, crew and ground personnel; and
- (g) it establishes a process to record and analyse the results of the National Civil Aviation Security Quality Control Programme to contribute to the effective development and implementation of the National Civil Aviation Security Programme, including identifying the causes and patterns of non-compliance and verifying that corrective actions are implemented and sustained.

(6) The National Civil Aviation Security Quality Control Programme shall—

- (a) provide for structures, responsibilities, processes and procedures that promote and establish an environment and culture of continuing improvement and enhancement of aviation security; and the means for ensuring that persons tasked with carrying out security duties do so effectively;
- (b) be used by the oversight and inspectorate department as a guide during the implementation of oversight functions;
- (c) ensure operators who perform aviation security measures develop, implement and maintain internal quality control measures that include quality control activities consistent with their operations, and shall provide the appropriate authority with related findings and details of any corrective action plans that have been implemented and sustained;
- (d) ensure operators do not accept cargo or mail for carriage on an aircraft engaged in commercial air operations unless the application of screening or other security controls is confirmed and accounted for by a regulated agent, known consignor, or an entity that is approved by the authority;
- (e) ensure operators subject to screening cargo and mail which cannot be confirmed and accounted for by a regulated agent, a known consignor or an entity that is approved by the authority;
- (f) ensure aircraft operators subject transfer cargo and mail to appropriate security controls prior to their being loaded onto an aircraft departing from the territory of Uganda;
- (g) ensure catering operators subject catering, stores and supplies intended for carriage on commercial flights to appropriate security controls, which may include a supply

chain security process or screening and shall protect them until loaded onto the aircraft;

- (h) ensure the airport operators establish and maintain contingency plans, and;
 - (i) conduct partial and full scale exercises to test the effectiveness of the plans on a regular basis as prescribed in regulations 27 (2) (l) and (m).
 - (ii) conduct an evaluation following an exercise to test the plans to identify deficiencies and remedy weaknesses in response mechanisms
- (i) ensure that supporting resources and facilities required by the aviation security services are made available at each airport serving civil aviation to safeguard civil aviation against acts of unlawful interference.

(7) The National Civil Aviation Security Quality Control Programme shall be reviewed and updated not less than once every two years or as and when the need arises.

(8) The operator internal quality control measures developed under subregulation(4) (c) to verify the implementation of existing security measures in accordance with the national requirements shall be submitted to the authority for approval prior to implementation.

14. Independence in implementation of the National Aviation Security Quality Control Programme

The National Civil Aviation Security Quality Control Programme shall include an element of independence of persons who conduct oversight activities from those who apply measures implemented under the National Civil Aviation Security Programme.

15. Airport Security Programme

(1) A person shall not operate an airport which serves civil aviation without an Airport Security Programme approved by the authority.

(2) An operator of an airport which serves civil aviation in Uganda shall establish, implement and maintain an Airport Security programme that meets the requirements of the National Civil Aviation Security Programme.

- (3) An application for an Airport Security Programme shall—
- (a) detail the specific security measures and procedures including threat assessment to be implemented at the airport;
 - (b) provide for internal quality control activities;
 - (c) provide for the appointment of a person who shall coordinate the implementation of the National Civil Aviation Security Programme;
 - (d) provide for the establishment of an Airport Security Committee in conformity with the requirements stipulated in the National Civil Aviation Security Programme;
 - (e) require the integration of the needs of aviation security into the design and construction of new facilities and alterations to existing facilities at the airport serving civil aviation, particularly for those areas which, on completion, are likely to be vital to the continuity of operations;
 - (f) provide for threat assessors at the airport;
 - (g) provide for security control measures and procedures for—
 - (i) originating, transit and transfer passengers and their baggage;
 - (ii) cargo and mail, including originating, transit, transfer and high risk cargo;
 - (iii) aircraft arriving into or departing from aerodromes in Uganda; and
 - (iv) persons, other than passengers, together with items carried, prior to entry into airport security restricted

areas which serves civil aviation operations, are subject to screening and security controls;

- (h) contain a contingency plan that provides for matters that include —
 - (i) measures and procedures in case an aircraft is hijacked and for hostage-taking at the airport and on board aircraft;
 - (ii) measures and procedures in case of sabotage, including bomb threats to aircraft and to the airport;
 - (iii) measures and procedures, in case of terrorist attacks on aircraft and the airport, including attacks using Chemical, Biological, Radiological and Nuclear Weapons and other Weapons;
 - (iv) procedures when a suspect device or item is found or is believed to be on board an aircraft;
 - (v) evacuation and search of airport facilities and aircraft on the ground;
 - (vi) special security measures to be enacted during periods of increased threat or for critical flights and routes; and
 - (vii) measures and procedures, in accordance with risk assessment carried out by relevant national or local authorities to mitigate possible terrorist attacks on aircraft and the airport using Man- Portable Air Defence Systems and other weapons representing a similar threat to aircraft at or near an airport;
- (i) contain information on security equipment and its deployment, where applicable and make reference to calibration and testing procedures, which may be further detailed in the standard operating procedures;
- (j) provide for adequate protection of security personnel and equipment from inclement or adverse weather at vehicle access gates; and

- (k) contain any other matter prescribed by the authority.
- (4) The Airport Security Programme shall be—
 - (a) reviewed and updated as and when the need arises and not less than once in every two years; and
 - (b) submitted to the authority for approval prior to implementation.

16. Air Navigation Service Providers Security programme

An Air Navigation Service Provider shall —

- (a) establish, implement and maintain a security programme or security manual that contains details of the security provisions that meet the requirements of the National Civil Aviation Security Programme;
- (b) provide for the training of staff in response to acts of unlawful interference in accordance with the National Civil Aviation Security Programme and the ICAO Doc 9985-Air Traffic Management Security Manual;
- (c) submit the security programme to the authority for approval; and
- (d) review the security programme once every two years and submit the revised programme to the authority for approval prior to implementation.

17. Aircraft Operator Security Programme

(1) A person shall not operate an aircraft that serves civil aviation from or within Uganda without a written Aircraft Operator Security Programme approved by the authority.

(2) A foreign commercial aircraft operator, that provides service to and from Uganda, whose aircraft operator security programme has been approved by the Appropriate authority of their State of registry shall submit their aircraft operator security programmes to the

authority for review prior to acceptance and shall establish, implement and maintain written supplementary station procedures that meet the requirements of the National Civil Aviation Security Programme of Uganda.

(3) A commercial aircraft operator who provides service in or from Uganda shall establish, implement and maintain a written Aircraft Operator Security programme that meets the requirements of the National Civil Aviation Security Programme and these Regulations.

(4) An Aircraft Operator Security Programme shall specify the security measures, procedures and practices to be followed by the operator to ensure the safety and protection of passengers, crew, ground personnel, the general public, aircraft and airport facilities from acts of unlawful interference.

(5) An application for Aircraft Operator Security Programme shall include —

- (a) the objectives of the programme and the measures that will be taken to ensure its implementation;
- (b) the organisation of the operator's security functions and responsibilities, including the designation of the operator in charge of aviation security;
- (c) specific security measures that comprise —
 - (i) pre-flight security checks or searches of originating aircraft to be conducted based on a security risk assessment carried out by the relevant national authorities;
 - (ii) procedures for screening of passengers' cabin baggage and hold baggage, where this function is not carried out by the airport operator;
 - (iii) procedures to ensure that no weapons, explosives or other dangerous devices are left on board by disembarking passengers at transit stops;

- (iv) reconciliation of originating hold baggage with boarding passengers, including transit and transfer passengers and authorisation of carriage of hold baggage prior to departure of the aircraft;
- (v) measures and procedures to ensure safety on board an aircraft where passengers to be carried are obliged to travel as subjects of judicial and administrative proceedings, including but not limited to—
 - (aa) an evaluation or risk assessment of potentially disruptive passengers to be conducted by the relevant authorities;
 - (bb) security measures to be applied before, during and on termination of the flight; and
 - (cc) the right of the aircraft operator or Pilot-In-Command to deny carriage based on the aircraft operator's policy concerning the number of such persons that may be transported on a given flight or when reasonable concerns exist in regard to the safety and security of the flight in question;
- (vi) procedures for the carriage of weapons in the cabin compartment and the aircraft hold;
- (vii) in-flight procedures when a suspected item is found or is believed to be on board an aircraft;
- (viii) movement of persons and vehicles parked next to aircraft;
- (ix) protection of hold baggage, cargo, mail and aircraft catering supplies and stores;
- (x) response procedures for crew members and other staff to occurrences and threats;

- (xi) protection of flight documents and other aircraft operator documents for ground services which may be used to commit an act or acts of unlawful interference and for such documents to be kept under the control of supervisory staff at all times;
 - (xii) procedures for screening, securing and control of known stores and unknown stores;
 - (xiii) procedures for application of security controls for COMAIL and COMAT; and
 - (xiv) procedures for passenger questioning,
- (d) measures and procedures to ensure the effectiveness of the programme including adequate training of staff and the periodic testing and evaluation of the security programme;
 - (e) measures and procedures to prevent unauthorised persons and vehicles from accessing aircraft and other restricted airline facilities;
 - (f) measures and procedures that passengers are in possession of valid documents prescribed by the State of transit and destination for control purposes;
 - (g) measures and procedures to protect the integrity of hold baggage from the time of check-in and screening up to the time it is loaded on the aircraft;
 - (h) procedures to ensure that an aircraft subject to a security check or search is protected from unauthorised interference, from the time the aircraft check or search commences until the aircraft departs; and
 - (i) any other matter prescribed by the authority.
- (6) An entity that conducts general aviation operations, including corporate aviation operations using aircraft with a maximum

take-off mass greater than 5,700 kg and those conducting aerial work operations shall develop, implement and maintain a written operator security programme that meets the requirements of the National Civil Aviation Security Programme which shall contain operations features specific to the type and size of operations conducted.

(7) An Aircraft Operator shall review and update the Aircraft Operator Security Programme as and when need arises after an act of unlawful interference and at least once in every two years.

18. Regulated Agent Security Programme and Ground Handling Service Providers Cargo and mail Security Programme

(1) A person shall not operate an enterprise or an organisation whose purpose is the handling of cargo and mail intended for carriage by air within or from Uganda, including implementing screening or other security controls of cargo and mail without a written Regulated Agent Security Programme approved by the authority and an approved certificate or licence issued by the authority.

(2) Ground handling service providers handling cargo shall not handle cargo without a cargo security programme approved by the authority.

(3) A Regulated Agent Security Programme and Ground Handling Service Providers Cargo Security Programme shall contain—

- (a) provisions that meet the cargo and mail requirements of the National Civil Aviation Security Programme and these Regulations;
- (b) provisions to respond to orders, circulars and directives issued by the authority under regulation 9;
- (c) details of how the regulated agent plans to meet and maintain the requirements set out in the Regulated Agent Security Programme; and
- (d) procedures for —

- (i) ensuring that where screening of cargo and mail is conducted, screening is carried out using an appropriate method, taking into account the nature of the consignment;
- (ii) ensuring that cargo and mail have been confirmed and accounted for;
- (iii) ensuring the security of buildings and premises where cargo and mail is handled; including access control and transport facilities;
- (iv) recruitment and training of staff involved in the implementation of security controls for cargo and mail;
- (v) incident reporting; and
- (vi) any other matter prescribed by the authority.

(4) The Regulated Agent Security Programme or Ground Handling Service Providers Cargo Security Programme shall take into consideration the secure supply chain security process, where applicable which comprises management of applicable cargo and mail policies, procedures, and technology as stipulated by the authority to protect supply chain assets from acts of unlawful interference, theft, damage or terrorism, and to prevent the introduction of contraband, human and unauthorised chemical, biological, radiological and nuclear weapons.

(5) The Regulated Agent or Ground Handling Service Providers handling cargo and mail or aircraft operator shall keep a register of its account consignor including identity, address and the particulars of an agent authorised to carry out deliveries of cargo or mail on its behalf.

(6) The Regulated Agent or Ground Handling Service Providers shall review and update the Regulated Agent Security Programme or Ground Handling Service Providers Cargo Security Programme.

(7) The review and update in subregulation (6) may arise after an act of unlawful interference and at least once every two years.

19. Catering Operator Security Programme

(1) A person shall not operate an enterprise or an organisation whose purpose is the direct provision to commercial air transport of catering supplies and stores within or from Uganda, without a Catering Operator Security Programme approved by the authority and a certificate issued by the authority.

(2) An application for a Catering Operator Security Programme shall contain—

- (a) provisions that meet the requirements of the National Civil Aviation Security Programme and these Regulations;
- (b) details of how the catering operator intends to comply with and maintain the requirements set out in the National Civil Aviation Security Programme;
- (c) procedures for —
 - (i) ensuring that catering, stores and supplies intended for carriage on commercial flights are subjected to appropriate security controls, which may include a supply chain security process or screening and thereafter protected until loaded onto the aircraft;
 - (ii) ensuring the security of buildings, premises where catering supplies and stores are prepared and the vehicles that transport the supplies;
 - (iii) recruitment, pre-employment background checks and training of staff involved in the implementation of security controls; and
 - (iv) reporting of incidents; and
- (d) any other matter prescribed by the authority.

(3) The Catering Operator shall review and update the Catering Operator Security Programme as and when need arises after an act of unlawful interference and at least once every two years.

20. Application for approval of Security Programme

(1) The applicant shall, where a security programme is required to be approved by the authority under regulations 13, 15, 16, 17 and 18 of these Regulations—

- (a) submit the programme to the authority, ensuring that the programme meets the requirements of the National Aviation Security Programme, these Regulations and any other relevant law; and
- (b) pay the fee prescribed by the authority.

(2) A security programme submitted to the authority for approval under subregulation(1) shall be in triplicate and shall be signed by the applicant or by a person authorised by the applicant on his or her behalf.

21. Approval of Security Programme

(1) Where the authority is satisfied that a security programme submitted under regulation 20, meets the requirements of these Regulations, the National Civil Aviation Security Programme and any other relevant law, the authority shall, within thirty days after receipt of the programme, approve the security programme.

(2) Where the authority determines that a security programme submitted under regulation 20 does not meet the requirements of the National Civil Aviation Security Programme or relevant law, the authority shall, within thirty days after receipt of the programme, direct the applicant to modify and re-submit the security programme to the authority within thirty days.

(3) Where the authority is satisfied that a security programme re- submitted under subregulation(2) meets the requirements of these Regulations, the National Civil Aviation Security Programme and any

other relevant law, the authority shall, within fifteen days after receipt of the programme, approve the security programme.

22. Changed conditions affecting security

(1) Where a security programme has been approved under regulation 21, the operator, where applicable, shall comply with the procedure prescribed by subregulation (2), whenever the operator determines that—

- (a) any description of the area, control measure or procedure set out in the security programme is no longer accurate or has been changed;
- (b) any description of the operations set out in the security programme is no longer accurate; or
- (c) that the procedures included and the facilities and equipment described in the security programme are no longer adequate.

(2) Whenever a situation described in subregulation (1) occurs, the operator, where applicable shall—

- (a) immediately notify the authority of the conditions that have changed and identify each interim measure being taken to maintain adequate security until approval is granted for an appropriate amendment of the security programme; and
- (b) within thirty days after notifying the authority in accordance with paragraph (a), submit for approval, in accordance with the procedure prescribed by regulation 20, an amendment to the security programme to bring it into compliance with these Regulations.

(3) The authority shall, where an amendment to a security programme is submitted to it under subregulation (2) (b), approve the amendment in accordance with the procedure prescribed under regulation 21.

23. Power of authority to direct amendment of Security Programme

(1) The authority may direct the respective operator to amend the security programme and submit the programme to the authority for approval where the authority determines that the security programme of the operator requires amendment.

(2) The authority shall, where an amended security programme is submitted to it under subregulation (1), approve the security programme in accordance with the procedure prescribed under regulation 20.

Training Programmes

24. National Civil Aviation Security Training Programme

(1) There is established a National Civil Aviation Security Training Programme for personnel involved with or responsible for the implementation of various aspects of the National Civil Aviation Security Programme.

(2) The National Civil Aviation Security Training Policy or Programme shall be designed to ensure the effectiveness of the national civil aviation security programme.

(3) The authority shall ensure the conduct of initial and recurrent security awareness training for all personnel involved with or responsible for the implementation of various aspects of the national civil aviation security programme and those authorised to have unescorted access to airside areas.

(4) The authority shall co-ordinate the implementation of the National Aviation Security Training Programme developed under sub regulation (1).

(5) The authority shall notify the entities concerned of the training requirements identified in the National Aviation Security Training Programme for their implementation.

(6) A person shall not operate a training centre whose purpose is to provide civil aviation security training in accordance with these Regulations and the National Civil Aviation Security Training Programme without an Approved Training Organisation Certificate issued by the authority.

(7) The authority shall ensure the development and implementation of training programmes and a certification system that ensures that aviation security screeners possess the necessary competencies and that instructors are qualified in the applicable subject matters in accordance with the national civil aviation security programme.

(8) The authority shall develop, implement and maintain a national aviation security certification systems programme for the entities concerned in subregulation (5).

(9) An aviation security screener and instructor, upon completion of initial or basic aviation security training and on-the-job-training, shall be certified.

(10) A person shall not carry out aviation security screening operations or duties unless he or she has been certified as a screener by the authority according to the requirements of the National Civil Aviation Security Programme to ensure that performance standards are consistently and reliably achieved.

(11) An aviation security screener and an instructor shall be re-certified, every three years in accordance with the National Civil Aviation Security Certification Systems Programme.

25. Operator Aviation Security Training Programme

(1) An operator shall implement the Aviation Security Training Programme to ensure the effective implementation of their respective security operations and the training programme shall conform to the requirements of the National Aviation Security Training Programme and these Regulations.

(2) A training programme referred to in subregulation (1) shall include—

- (a) training of appropriate employees, taking into account human factors principles and human performance; and
- (b) training to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on an aircraft to enable them to contribute to the prevention of acts of sabotage, unlawful seizure of aircraft or other forms of unlawful interference and to minimise the consequences of such events should they occur.

(3) A training programme referred to in subregulation (1) shall be submitted to the authority for approval in accordance with the procedure prescribed under regulations 20 and 21.

(4) An aircraft operator shall establish and maintain an Approved Security Training Programme that ensures crew members act in the most appropriate manner to minimise the consequences of acts of unlawful interference.

(5) The programme under subregulation (4) shall include training on—

- (a) the verification of the seriousness of any occurrence;
- (b) crew communication and coordination;
- (c) appropriate self-defence responses;
- (d) use of non-lethal protective devices assigned to crew members, whose use is authorised by the State of the Operator;
- (e) the understanding of behaviour of terrorists to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
- (f) live situational training exercises regarding various threat conditions; and

- (g) flight crew compartment procedures to protect the aircraft.

PART IV— PREVENTIVE SECURITY MEASURES

Airport Security

26. Airport Security Committee

(1) There is established at every airport serving civil aviation an Airport Security Committee.

- (2) The functions of the Airport Security Committee are —
 - (a) to coordinate the implementation and maintenance of security controls and procedures as specified in the Airport Security programme referred to in regulation 15;
 - (b) to oversee the implementation of the decisions or directives of the National Civil Aviation Security Committee;
 - (c) to oversee and monitor the implementation of the Airport Security Programme, including any special measures including standard operating procedures introduced by the airport administration, operators and airport tenants;
 - (d) to draw up, maintain and review from time to time, a list of vulnerable points and essential equipment and facilities;
 - (e) to ensure that—
 - (i) basic minimum - security measures and procedures are satisfactory to meet threats and are under constant review, providing for normal situations and periods of heightened tension and emergency situations;
 - (ii) recommendations that improve security measures and procedures are implemented;
 - (iii) security measures are incorporated in airport expansion or modification programmes; and
 - (f) to co-ordinate security education, awareness and training of airport and other staff and the general public.

(3) The Airport Security Committee shall refer any matter relating to aviation security, which it cannot resolve at the airport level to the National Civil Aviation Security Committee.

(4) The person in charge of the airport shall be the Chairperson of the Airport Security Committee.

(5) The person in charge of the airport shall appoint other members of the Airport Security Committee, nominated by the respective agencies, in accordance with subregulation (6).

(6) The Airport Security Committee shall, where available, consist of members from all agencies engaged in the operation of the airport which contribute to the establishment and implementation of security measures including —

- (a) persons in charge of airport administration;
- (b) persons in charge of aviation security at the airport;
- (c) the authority;
- (d) military;
- (e) police;
- (f) immigration;
- (g) local authorities of the area in which the airport or aerodrome is situated;
- (h) explosive detection expert;
- (i) intelligence agencies;
- (j) ministry of health;
- (k) postal services;
- (l) fuel companies;
- (m) handling agents;
- (n) in-flight caterers;
- (o) a representative of the airlines;

- (p) a representative of the airport tenants;
- (q) air navigation services providers;
- (r) fire and rescue services;
- (s) customs; and
- (t) Uganda Wildlife Authority.

(7) The Airport Security Committee may invite any person to attend and take part in the proceedings of the Committee and that person may participate in any discussion at the meeting but shall not have a right to vote at that meeting.

(8) The Chairperson shall convene a meeting of the Airport Security Committee every quarter for the discharge of its business as and when it may be deemed necessary to ensure that the security programme is up-to-date and effective, and that its provisions are being properly applied.

(9) The minutes of the Airport Security Committee shall be taken and a copy of the minutes shall be submitted to the authority.

27. Airport security controls

(1) An airport operator shall maintain and carry out security measures and procedures including identification and resolution of suspicious activity that may pose a threat to civil aviation at the airport for the purpose of protecting passengers, crew members, aircraft, airports and aviation facilities and preventing acts of unlawful interference and ensuring that appropriate action is taken when an act of unlawful interference occurs or is likely to occur.

(2) An operator of an airport that serves civil aviation shall be responsible for the security of facilities and employment of security equipment, where appropriate, to achieve civil aviation security objectives and shall—

- (a) institute and maintain measures including the use of random and unpredictable security measures to prevent weapons, explosives or any other dangerous device which

may be used to commit an act of unlawful interference, the carriage or bearing of which is not authorised, from being introduced, by any means, on board an aircraft engaged in civil aviation;

- (b) ensure that—
 - (i) access to airside areas at the airport is controlled in order to prevent unauthorised entry;
 - (ii) measures are established to subject to screening persons other than passengers prior to being granted access to airport security restricted areas, together with items carried;
 - (iii) security restricted areas are identified and established at the airport and access controlled, in accordance with regulation 28;
 - (iv) architectural and infrastructure related requirements necessary for the optimum implementation of security measures under the National Civil Aviation Security Programme are integrated into the design and construction of new facilities and alterations to existing facilities at airports;
 - (v) persons engaged to implement security controls are subject to background checks, selection procedures and are adequately trained;
 - (vi) originating passengers, crew and their cabin baggage; are screened before accessing restricted areas and before boarding an aircraft engaged in commercial air transport operations;
 - (vii) originating hold baggage and crew hold baggage is screened before being loaded into an aircraft engaged in commercial air transport operations;
 - (viii) all hold baggage to be carried on an aircraft engaged in commercial air transport is protected from

unauthorised interference from the point it is screened or accepted into the care of the carrier, whichever is earlier, until the departure of the aircraft on which it is to be carried and that where the integrity of hold baggage is jeopardised, the hold baggage is re-screened before being placed on board an aircraft;

- (ix) commercial air transport operators do not transport the baggage of persons who are not on board the aircraft, unless that baggage is identified as unaccompanied and subjected to appropriate screening;
- (x) transfer hold baggage is screened before being loaded into an aircraft engaged in commercial air transport, unless the appropriate authority has established a validation process and continuously implements procedures, in collaboration with the other Contracting State where appropriate, to ensure that such hold baggage has been screened at the point of origin and subsequently protected from unauthorised interference from the originating airport to the departing aircraft at the transfer airport;
- (xi) transfer and transit passengers and their cabin baggage are subjected to adequate screening and other security controls to prevent unauthorised articles from being taken on board aircraft engaged in civil aviation, unless the appropriate authority has established a validation process and continuously implements procedures, in collaboration with the other Contracting State where appropriate, to ensure that such passengers and their cabin baggage have been screened to an appropriate level at the point of the originating airport and subsequently protected from unauthorised interference from the point of screening to the departing aircraft at the transfer airport;

- (xii) that passengers who have been screened and their baggage are protected from unauthorised interference, from the point of screening, until they board their aircraft, and there is no possibility of mixing or contact between passengers subjected to security control and other persons not subjected to such control after the security screening points have been passed and that where mixing or contact does take place, the passengers concerned and their cabin baggage are re-screened before boarding an aircraft;
- (xiii) persons carrying out security controls are certified in accordance with the requirements of the National Civil Aviation Security Programme;
- (xiv) procedures are established to deal with unidentified baggage and suspicious objects in accordance with a security risk assessment carried out by the relevant national authorities;
- (xv) persons other than passengers, together with their items, being granted access to security restricted areas are screened or subjected to other security controls, including but not limited to proportional screening, randomness and unpredictability in accordance with a risk assessment carried out by relevant national authorities;
- (xvi) vehicles being granted access to security restricted areas, together with items contained in the vehicles, are screened or subjected to other appropriate security controls in accordance with a risk assessment carried out by the relevant national authorities;
- (xvii) measures are established to ensure that merchandise and supplies introduced into security restricted areas are subjected to appropriate security controls,

including screening or a supply chain security process, where applicable for instance, where the airport supplies are customs bonded goods, the airport operator shall establish procedures to be followed prior to taking the goods into the security restricted area;

- (xviii) landside areas are identified, security measures are established and implemented in landside areas to mitigate possible threats of acts of unlawful interference in accordance with a risk assessment carried out by the relevant authorities;
 - (xix) where practicable, in order to improve efficiency, modern screening or examination techniques shall be used to facilitate the physical examination of goods to be imported or exported;
 - (xx) vehicles being granted access to airport airside and security restricted areas, together with items contained within them are subjected to screening or other appropriate security controls in accordance with a risk assessment carried out by the relevant national authorities; and
 - (xxi) measures are established at the airport for transfer or transit operations to protect transfer or transit passengers and their cabin baggage from unauthorised interference, and to protect the integrity of the security of the airport;
- (c) promote the use of randomness and unpredictability in the implementation of security measures as appropriate, that could contribute to the deterrent effect of security measures;

- (d) ensure that the appropriate screening methods used are capable of detecting the presence of explosives and explosive devices carried by persons other than passengers on their persons or in their items carried and where these methods are not applied continuously, they are used in an unpredictable manner;
- (e) ensure that the appropriate screening methods used are capable of detecting the presence of explosives and explosive devices in hold baggage;
- (f) the appropriate standards for screening are as defined in the national civil aviation security programme;
- (g) establish and implement—
 - (i) storage areas where mishandled baggage may be held after screening until forwarded, claimed or disposed of;
 - (ii) bomb disposal areas where detected explosives may be disposed of; and
 - (iii) identification systems in respect of persons and vehicles in order to prevent unauthorised access to airside and security restricted areas where—
 - (aa) access shall be granted only to those with an operational need or other legitimate reason to be in airside and security restricted area (s);
 - (bb) identity and authorisation is verified at designated checkpoints before access is allowed to airside and security restricted areas;
 - (iv) a vehicle permit system where all vehicle permits are affixed to and permanently displayed on the front of the vehicle while in designated areas—
 - (aa) design specifications for vehicle permits; and
 - (bb) periodic renewal of vehicle permits;

- (h) institute and implement adequate security controls;
- (i) provide adequate supervision over the movement of persons and vehicles to and from the aircraft in order to prevent unauthorised access to aircraft;
- (j) make arrangements to render safe, investigate and dispose of, where necessary, suspected sabotage devices or other potential hazards at the airport;
- (k) employ and deploy suitably trained personnel to assist in dealing with suspected or actual cases of unlawful interference with civil aviation;
- (l) conduct a full scale security exercise to test the effectiveness of the contingency plans at least once every two years; and
- (m) conduct a table top contingency security exercise at least once a year.

28. Security restricted areas and airport security permits

(1) The airport operator shall identify areas where, based on a security risk assessment carried out by the relevant national authorities, operations vital to the continued safe operation of civil aviation in Uganda are carried out and designated as security restricted areas.

- (2) An area designated as a security restricted area shall be—
 - (a) marked and protected through physical or personnel protective measures or through a combination of physical and personnel protective measures to prevent unauthorised access to it;
 - (b) separated from public or non security restricted areas by an appropriate physical barrier; and
 - (c) inspected at regular and random intervals.

(3) Authorised access to security restricted areas at airports and designated off-airport facilities serving civil aviation operations shall be controlled through the issuance of airport security permits.

(4) A person issued with an airport security permit under this regulation shall, while on duty, at all times properly display the security permit.

(5) Designated authorities responsible for controlling access to security restricted areas shall specify the recognised places of entry through the security restricted area barrier and ensure that the area has adequate physical protection, of the same quality as the barrier itself, or enough to prevent unauthorised access.

(6) All areas at an airport to which access is restricted shall bear signage indicating the type of restriction and penalty for non-compliance.

(7) An airport operator shall keep, at the airport, a current scale map of the airport identifying security restricted areas, security barriers and security restricted area access points.

(8) An airport operator shall carry out background checks on persons other than passengers granted unescorted access to Security Restricted Areas of the airport prior to granting access to Security Restricted Areas following the criteria prescribed in regulation 13(4) (d).

29. Airport fencing or boundary

An airport operator shall provide for—

- (a) a fence or other conspicuous suitable physical barrier on an aerodrome to deter the inadvertent or premeditated access of an unauthorised person into a non-public area of the aerodrome or means of indicating the airport boundary with posted signs bearing a warning to prevent incursions and trespassing;

- (b) measures for the continuous protection and monitoring of the integrity of the perimeter fence to detect tampering and to prevent incursions and trespassing;
- (c) a perimeter fence, kept clear of obstructions, with an exclusion zone of a distance of not less than 5 metres from both the landside and airside in order to remove cover for any intruders which may include, but are not limited to, lamp posts, signposts, equipment, vehicles, anthills and trees, that may assist an intruder to climb over the fence;
- (d) a well drained obstacle free perimeter road alongside the fence suitable for vehicles to permit the passage of motorised patrol;
- (e) an appropriate perimeter fencing of at least the same technical specifications as the aerodrome land perimeter for key airport installations and other vulnerable points, including but not limited to a fuel farm and air navigation facilities, located within the aerodrome;
- (f) access gates constructed to the same security standard as perimeter fences and access controls to be put in place;
- (g) continuously locked gates that shall be surveilled and guarded;
- (h) emergency or crash gates to be installed in the perimeter fence of an airport to allow the quick access or egress of emergency service vehicles to on-airport or off-airport aircraft accidents;
- (i) fencing of a minimum height of 2.44 m or 8 feet, augmented by inclined barbed wire or razor-taped wire, to deter scaling;
- (j) a fence to be buried into the ground or affixed to a concrete base to prevent a person from pulling it up at the bottom and crawling or burrowing under it; and

- (k) safety and operational considerations with regard to special fencing materials or construction methods, including the use of non-metallic and frangible fencing material at certain locations on the perimeter, particularly the take-off and landing runway thresholds, to prevent the, disruption of the operation of navigation aids.

30. Carriage of firearms, ammunitions, incendiary devices or explosives in airport premises

Except for law enforcement officers on duty, a person shall not carry or possess in the airport premises; firearms, ammunition or explosives unless authorised in writing by the Uganda Police Force, which shall report any authorisation to the authority.

31. Control of access by tenants

(1) An airport operator shall ensure that tenants whose premises or facilities form part of the landside or airside boundary through which access can be gained to the airside, are responsible for the control of access through their premises and shall conduct their business in compliance with the Airport Security Programme.

- (2) In subregulation (1), “tenants” means —
 - (a) individuals or businesses granted a licence or other permit by the airport operator to conduct business operations at the airport, including concessionaires, cargo handlers, caterers, tour operators, taxi and bus operators, porters, aircraft maintenance organisations and fuel companies; and
 - (b) Government authorities and agencies at the airport including customs, immigration, health, agriculture and meteorology.

32. Obligation of airport operator in case of threat against facility or airport

Where an airport operator is aware or made aware of a threat against a facility or any part of the airport under the control of a person carrying on any activity at the airport, the airport operator shall immediately—

- (a) notify the authority and other entities concerned about the nature of the threat in accordance with regulation 52; and
- (b) determine whether the threat affects the security of the airport and coordinate the implementation of appropriate measures to counter the threat.

33. Persons authorised to screen to inform airport operator of threat against airport

Where a person authorised to conduct any screening activity at an airport is aware of or made aware of a threat against the airport, that person shall—

- (a) immediately notify the airport operator of the nature of the threat; and
- (b) assist the airport operator in determining whether the threat affects the security of the airport.

34. Airport operator to take measures in event of threat

(1) Where an airport operator determines that there is a threat that affects the security of the airport, the airport operator shall immediately take all measures necessary to ensure the safety of the airport and persons at the airport including informing the relevant authorities of the nature of the threat.

(2) An airport operator shall immediately inform the authority of the receipt of a credible bomb threat against an airport and its facilities or an aircraft based on a threat assessment carried out by the relevant authorities and a coherent response in accordance with the classification of the threat.

35. Discovery of weapons, ammunition, incendiary devices or explosives at airport

An airport operator shall immediately report to the Uganda Police Force and notify the authority when there is—

- (a) a discovery, at the airport, of a weapon other than a firearm allowed under regulation 30;

- (b) a discovery, at an airport, of ammunition other than ammunition allowed under regulation 30;
- (c) a discovery, at the airport, of an explosive or an incendiary device, other than an explosive or incendiary device allowed under regulation 30;
- (d) an explosion at the airport, unless the explosion is known to be the result of an excavation, a demolition, construction or the use of fireworks displays authorised by the Uganda Police Force; or
- (e) a discovery at an airport, of unauthorised chemical, biological, radiological and nuclear weapons capable of being used for causing injury to or incapacitating persons or destroying property.

36. Airport operator to submit plans before renovation and expansion works

(1) Notwithstanding regulation 27(2)(b)(iv), an airport operator shall, before the implementation of any renovation, remodeling or expansion works at the airport or the construction of new or additional airport facilities, submit to the authority for its approval, the plans for the renovation and expansion works.

(2) The authority shall, in approving the plans submitted to it under subregulation (1), assess the plans to ensure that security considerations are properly addressed and that the needs of aviation security are integrated in the configuration of the works.

Records

37. Operators to keep records

(1) An operator shall keep or maintain records of routine security operational activities or duties, including routine maintenance and testing of security equipment.

(2) The records in subregulation(1) shall be made available for review to the appropriate authority upon request.

(3) An operator shall keep a record of every security incident occurring in the course of their operations.

(4) A record required to be kept under subregulation(3), shall—

- (a) be kept for a minimum of ninety days;
- (b) be submitted to the authority within thirty days after the occurrence of the incident; and
- (c) where relevant, include —
 - (i) the number and type of weapons, improvised explosive devices and incendiary devices discovered during any passenger screening process and the method of detection of each weapon or device;
 - (ii) the number of acts and attempted acts of unlawful interference;
 - (iii) the number of bomb threats received, real and simulated bombs found and actual bombings or explosions at the airport or aircraft in flight within the Ugandan territory and aviation facilities which have connection to the airport; and
 - (iv) the number of detentions and arrests and the immediate disposition of each person detained or arrested.

Aircraft Security

38. Responsibilities of aircraft operator

(1) An aircraft operator who provides service from Uganda and an aircraft operator registered in Uganda and operating in a foreign State shall not—

- (a) transport the baggage of a passenger who is not on board the aircraft unless that baggage is subjected to appropriate security controls, including screening, after determining that the person is not on board; or
- (b) accept consignments of cargo, courier and express parcels or mail, in-flight catering and stores, company mail and materials for carriage on passenger flights, unless the security of the consignments is accounted for by a regulated agent, or the consignments are subjected to security controls to meet the appropriate security requirements.

(2) An aircraft operator who provides services in or from Uganda and an aircraft operator registered in Uganda and operating in a foreign State shall—

- (a) carry out and maintain, at an airport, on an aircraft and at any aviation facility under the control of the operator, security measures including identification and resolution of suspicious activity that may pose a threat to civil aviation, and any other measures prescribed in the National Civil Aviation Security Programme and the Airport Security Programme;
- (b) ensure that—
 - (i) all its appropriate personnel are familiar with, and comply with the requirements of the Aircraft Operator Security Programme;
 - (ii) necessary precautions are taken at the point of embarkation to ensure that passengers are in possession of valid documents prescribed by the state of transit and destination for control purposes; and
 - (iii) all its aircraft carry a checklist of the procedures to be complied with for that type of aircraft in

searching for a bomb in case of suspected sabotage and for inspecting aircraft for concealed weapons, explosives or other dangerous devices when a well-founded suspicion exists that the aircraft may be the object of an act of unlawful interference;

- (c) be responsible for the security of their aircraft, including supervision of the movement of persons and vehicles to and from the aircraft in security restricted areas in order to prevent unauthorised access to aircraft;
- (d) ensure that persons engaged to implement security controls are subject to background checks, selection procedures and are adequately trained; and
- (e) institute measures to identify and remove any suspicious, restricted, prohibited, dangerous or hazardous items—
 - (i) before departure of an aircraft engaged in commercial flights;
 - (ii) after passengers have disembarked from an aircraft engaged in commercial flights; and
 - (iii) left behind by passengers disembarking from transit flights.

(3) The checklist in subregulation(2) (b) (iii) shall be supported by guidance on the appropriate course of action to be taken where a bomb or suspicious object is found in addition to the information on the least- risk bomb location specific to the aircraft.

(4) Commercial air transport operators shall only transport items of hold baggage which have been individually identified as accompanied or unaccompanied, screened to the appropriate standard and accepted for carriage on that flight by the air carrier and that all such baggage is recorded as meeting the criteria and is authorised for carriage on that flight.

39. Special protection for aircraft

(1) Notwithstanding regulation 38 (2) (c), an aircraft operator may request for special protection of their aircraft from an airport operator at a fee to be determined by the airport operator, where the aircraft operator perceives a threat against their aircraft.

(2) Where special protection is offered to an aircraft operator under subregulation (1), the protection shall be on terms and conditions determined by the airport operator.

(3) Operators of aircraft of a maximum certificated take-off mass in excess of 45,500 kg or with a passenger seating capacity greater than sixty and for which the application for certification was submitted on or after 1st March, 2000, shall make provisions during the design of the aircraft of a Least-Risk Bomb Location to minimise the effects of a bomb on the aircraft and its occupants.

40. Control of prohibited items or restricted articles

(1) A person shall not, subject to regulation 28, possess or have with him or her a prohibited item or restricted articles other than “tools of trade” authorised by the airport operator while—

- (a) in the airside or security restricted areas;
- (b) on board an aircraft; or
- (c) in an air navigation installation.

(2) The prohibited items referred to in subregulation (1) include—

- (a) firearms or firearms replicas, whether or not they can be discharged;
- (b) chemical, biological, radiological agents or nuclear weapons adapted or capable of being used for causing injury to or incapacitating persons or damaging or destroying property;
- (c) ammunition and explosives;

- (d) articles manufactured or adapted to have the appearance of explosives, whether in the form of a bomb, grenade or otherwise;
- (e) articles made or adapted for causing injury to or incapacitating persons or damaging or destroying property; and
- (f) any other dangerous article or substance or other item as may be prescribed by the authority.

41. Control of access to flight crew compartment

(1) An aircraft operator engaged in commercial air transport shall protect the flight crew compartment from unauthorised access during flight by implementing the following measures—

- (a) where a passenger-carrying aircraft of a maximum certificated take-off mass in excess of 45,500 kilograms or with a passenger seating capacity greater than sixty ensure that the aircraft is equipped with an approved flight crew compartment door designed to resist penetration by small fire arms and grenade shrapnel, to resist forcible intrusions by unauthorised persons and the door shall be capable of being locked and unlocked from either pilot's station;
- (b) where an aircraft is equipped with a flight crew compartment door, ensure that the door is capable of being locked and have means by which cabin crew can discreetly notify the flight crew in the event of suspicious activity are provided or security breaches in the cabin;
- (c) where an aircraft is not equipped with a flight crew compartment door, ensure the implementation of measures as appropriate to prevent unauthorised persons from entering the flight crew compartment during flight; or

- (d) where an aircraft is equipped with a flight crew compartment door in accordance with paragraph (b)—
 - (i) the door shall be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorised persons; and
 - (ii) shall enable monitoring from either pilot's station of the entire door area outside the flight crew compartment to identify persons requesting entry and to detecting for the purpose of suspicious behavior or potential threat.

42. Control of special categories of passengers

(1) Where passengers are obliged to travel because they have been the subject of judicial or administrative proceedings, law enforcement officers shall inform the aircraft operator and the Pilot In Command in order that appropriate security controls can be applied.

(2) The aircraft operator shall inform the Pilot In Command of the number of armed or unarmed escort persons, the individuals whom they are escorting and their seat locations in the aircraft.

43. Authorised carriage of weapons on board aircraft

(1) The carriage of weapons on board an aircraft by law enforcement officers and other authorised persons, acting in the performance of their duties, shall be in accordance with the laws of Uganda.

- (2) Subject to subregulation(1), the authority may—
 - (a) approve, in writing, the carriage of weapons on board an aircraft by law enforcement officers and other authorised persons acting in the performance of their duties; or

(b) consider requests by a State to allow the travel of armed personnel, including in-flight security officers on board an aircraft of the requesting State, except that the authority shall not allow the travel of armed personnel under this regulation unless there is an agreement between both States relating to such travel.

(3) Notwithstanding subregulation (2), an aircraft operator may permit or refuse the carriage of weapons on board an aircraft in accordance with conditions issued by the authority.

(4) Where an aircraft operator accepts the carriage of weapons removed from passengers, the aircraft shall have provision for stowing the weapons so that they are inaccessible to passengers during flight time and, in the case of a firearm, to ensure that it is not loaded by an authorised and duly qualified personnel.

(5) Where Uganda deploys in-flight security officers—

(a) the officers shall be government personnel who are especially selected and trained, taking into account the safety and security aspects on board an aircraft; and

(b) the officers shall be deployed according to the threat assessment carried out by the relevant authority.

(6) The deployment under subregulation (5) shall be done in co-ordination with the concerned States and shall be kept strictly confidential.

Regulated Agents

44. Conditions for acceptance of cargo and mail for air transportation

(1) A regulated agent and Ground Handling Service Provider handling cargo and mail shall, before accepting cargo and mail for transport in an aircraft—

- (a) establish and register the name and address of the consignor;
- (b) establish the credentials of the person who delivers the cargo and mail as an agent of the consignor;
- (c) ensure, on the basis of appropriate security controls or security screening, that such cargo and mail does not contain any prohibited items;
- (d) ensure the safeguard of such cargo and mail from unauthorised interference after acceptance;
- (e) ensure that the cargo and mail are received by staff who are properly recruited and trained;
- (f) designate a person to implement and supervise the screening of the cargo and mail;
- (g) ensure that the following categories of cargo and mail are not carried by air unless they have been subjected to screening—
 - (i) unaccompanied baggage;
 - (ii) cargo and mail from unknown consignors; or
 - (iii) cargo and mail for which the contents do not coincide with the description delivered; and
- (h) ensure that each shipment of cargo and mail is accompanied by documentation providing the statement of the security status of the shipment.

(2) A regulated agent who offers cargo and mail to an aircraft operator for transport by aircraft shall produce and make available to the aircraft operator and the authority, on demand, shipping documents, records of cargo and mail accepted and offered for air transport, employee training records and airway bills.

(3) A regulated agent shall make available to the authority, a report of any incident where a shipping document did not provide an accurate record of the cargo and mail being offered for air transport.

(4) All cargo and mail intended for carriage on civil aviation flights shall be subjected to appropriate security controls by aircraft operators and regulated agents before being placed on board an aircraft.

45. Conditions for acceptance of hold baggage, cargo and mail, COMAT and COMAIL for air transportation

For the purposes of protecting passengers, crew members, aircraft and airports and preventing acts of unlawful interference with civil aviation, every aircraft operator shall establish measures to ensure that—

- (a) only screened hold baggage is loaded into an aircraft engaged in civil aviation;
- (b) all hold baggage to be carried on a commercial aircraft is protected from unauthorised interference from the point it is screened or accepted into the care of the carrier, whichever is earlier, until departure of the aircraft on which it is to be carried and that if there are grounds to suspect that the integrity of the hold baggage may be jeopardised, the hold baggage is re-screened before being placed on board an aircraft;
- (c) persons engaged to implement security controls are subject to background checks, selection procedures and are adequately trained;
- (d) appropriate security controls, including screening where practicable, are applied to cargo and mail, prior to their being loaded onto an aircraft;
- (e) COMAT and COMAIL are subjected to appropriate security controls prior to placement on board an aircraft engaged in passenger commercial flights;

- (f) all cargo and mail to be carried on a commercial aircraft is protected from unauthorised interference from the point of screening or other security controls are applied until departure of the aircraft on which it is to be carried and if there are grounds to suspect that the integrity of cargo and mail may be jeopardised, the cargo and mail is re-screened before being placed on board an aircraft;
- (g) an airport operator, an aircraft operator or a regulated agent shall establish and maintain initial and recurrent dangerous goods training programmes and comply with the International Civil Aviation Organisation Technical Instructions for the Safe Transportation of Dangerous Goods by Air, Doc. 9284 and any amendments which may be specified during a period of applicability of an edition; and
- (h) enhanced security measures apply to high-risk cargo and mail to appropriately mitigate the threats associated with it.

46. Security measures to be taken by aircraft operator

(1) An aircraft operator is responsible for ensuring that appropriate security controls have been carried out, and in so doing, the aircraft operator shall —

- (a) not accept cargo or mail for carriage on an aircraft engaged in commercial air transport operations unless the application of screening or other security controls is confirmed and accounted for by a regulated agent, a known consignor or an entity that is approved by the authority;
- (b) ensure that cargo and mail which cannot be confirmed and accounted for by a regulated agent, a known consignor or an entity approved by the authority is subjected to screening;
- (c) protect cargo and mail from unauthorised interference while it is in the custody of the aircraft operator;
- (d) ensure that all cargo and mail is secured to an appropriate level before being placed in the aircraft;

- (e) ensure that where screening of cargo and mail is conducted, screening is carried out using an appropriate method or methods, taking into account the nature of the consignment;
- (f) ensure that all consignments placed on board the aircraft are recorded on the aircraft manifest;
- (g) ensure that cargo and mail that has been confirmed and accounted for is issued with a consignment security declaration and the security status which shall be indicated, either in an electronic format or in writing, the cargo and mail throughout the secure supply chain; and
- (h) ensure that transfer cargo and mail have been subjected to appropriate security controls prior to being loaded on an aircraft engaged in commercial air transport operations departing from the territory of Uganda.

(2) An aircraft operator may delegate any of the functions under subregulation (1) to a regulated agent.

(3) Notwithstanding the delegation of any functions to a regulated agent under subregulation (2), the aircraft operator shall remain responsible for ensuring that the appropriate security controls have been carried out.

(4) The aircraft operator or the regulated agent acting on behalf of an aircraft operator shall ensure that all consignments due to be loaded into an aircraft are —

- (a) delivered by an established employee or agent of the aircraft operator;
- (b) covered by valid documentation that has been checked for inconsistencies and fully describes the contents of the consignment;

- (c) covered by a valid consignment security declaration;
- (d) checked to establish that there is no evidence of tampering with the consignment;
- (e) kept secure until delivered into the aircraft operator's charge; and
- (f) subjected to the appropriate level of security screening.

(5) An aircraft operator shall make available to the authority, a report of any incident where an airway bill or equivalent document did not provide an accurate record of the goods being offered for air transport.

(6) An aircraft operator shall require a regulated agent to comply with International Civil Aviation Organisation Technical Instructions for the Safe Transportation of Dangerous Goods by Air Doc.9284.

(7) Appropriate security controls referred to in this regulation shall be as prescribed by the authority from time to time.

(8) An aircraft operator shall—

- (a) not transport the baggage of passengers who are not on board the aircraft unless the baggage is identified as unaccompanied and subjected to additional screening; or
- (b) transport items of hold baggage which have been individually identified as accompanied or unaccompanied, screened to the appropriate standard and accepted for carriage on that aircraft and ensure that such baggage is recorded as meeting the criteria under subregulation (1) and procedures for authorisation for carriage of hold baggage on that flight.

(9) An aircraft operator shall ensure that enhanced security measures are applied to high risk cargo and mail to appropriately mitigate the threats associated with it.

Catering Operators

47. Aviation security responsibilities of catering operator

(1) A catering operator shall, before accepting supplies and equipment for preparation as catering supplies for transport in an aircraft —

- (a) register the name and address of the supplier of the supplies and equipment with the authority;
- (b) establish the credentials of the person who delivers the supplies and equipment;
- (c) ensure, on the basis of appropriate security controls or security screening, that the supplies and equipment do not contain any prohibited items;
- (d) ensure the safeguarding of the supplies and equipment from unauthorised interference after acceptance;
- (e) ensure that the supplies and equipment are received by staff who are recruited and trained by the operator;
- (f) designate a person to implement and supervise the screening process;
- (g) ensure that catering stores and supplies are not carried by air unless they have been subjected to screening;
- (h) ensure that each shipment of catering stores and supplies is accompanied by documentation providing the statement of the security status of the shipment;
- (i) ensure that persons engaged to implement security controls are capable of fulfilling their duties and are adequately trained—
 - (i) background checks are completed in respect of persons implementing security controls, persons with unescorted access to security restricted areas

and persons with access to sensitive aviation security information prior to their taking up these duties or accessing such areas or information;

- (ii) recurrent background checks are applied to such persons at intervals defined by the appropriate authority; and
 - (iii) persons found unsuitable by any background check are immediately denied the ability to implement security controls, unescorted access to security restricted areas, and access to sensitive aviation security information;
- (j) ensure the safety of the catering supplies and stores against unlawful interference until the catering supplies and stores have been placed in the aircraft.

(2) A catering operator who offers catering stores and supplies to an aircraft operator for transport by aircraft shall produce and make available to the aircraft operator and the authority, on demand, shipping documents, records of supplies and equipment accepted and catering stores and supplies offered for air transport, employee training records and other accountable catering documents.

48. Conditions for acceptance of catering stores and supplies for air transportation

(1) An aircraft operator shall accept catering stores and supplies for transport on an aircraft from a catering operator only.

(2) An aircraft operator shall, before accepting catering stores and supplies for transport on an aircraft, ensure —

- (a) that the catering stores and supplies have been subjected to appropriate security controls which may include screening;
- (b) that the shipments of catering supplies and stores are recorded; and

(c) that catering supplies and stores are delivered by an authorised employee of the catering operator.

(3) An aircraft operator shall not accept any catering supplies and stores for transport by an aircraft unless the documentation for those catering supplies and stores is examined for inconsistencies and is accompanied by a valid security declaration.

(4) An aircraft operator shall require a catering operator to comply with the International Civil Aviation Organisation Technical Instructions for the Safe Transportation of Dangerous Goods by Air, Doc. 9284.

(5) An aircraft operator shall make available to the authority, a report of any incident where a catering or equivalent document did not provide an accurate record of the catering supplies and stores being offered for air transport.

(6) An aircraft operator shall preserve, for not less than one year, a record of acceptance checklists and inspections carried out under regulation 48.

Critical Information and Communication Systems

49. Protection of critical information technology and communication systems

(1) The authority shall, in accordance with the risk assessment carried out by the relevant national authorities, ensure that measures are developed in order to protect critical information technology and communication systems used for civil aviation purposes from acts of unlawful interference that may jeopardise the safety of civil aviation.

(2) The entities responsible for the implementation of various aspects of the National Civil Aviation Security Programme shall identify their critical information technology and communication systems and data including threat and vulnerabilities and develop protective measures, including security by design, supply chain

security, network separation and remote access control as appropriate, for the safe and secure operation and availability of aviation activities.

PART V—MANAGEMENT OF RESPONSE TO ACTS OF UNLAWFUL INTERFERENCE

50. Prevention of acts of unlawful interference

(1) The authority shall take adequate measures, where reliable information exists that an aircraft may be subjected to an act of unlawful interference as follows—

- (a) where the aircraft is on the ground, to safeguard the aircraft and ensure that the aircraft is searched for concealed weapons, ammunition, explosives or other dangerous devices, articles or substances and prior notification of the search shall be provided to the operator concerned; or
- (b) where the aircraft is in flight, to provide as much prior notification as possible of the arrival of that aircraft to relevant airport authorities and air traffic services of the States and aircraft and airport operators concerned.

(2) The authority shall co-ordinate with the Uganda Police Force to ensure that arrangements are made to investigate, render safe or dispose of, if necessary, suspected dangerous devices or other potential hazards at airports.

(3) The authority shall ensure that authorised and suitably trained personnel are readily available for deployment at every airport serving civil aviation to assist in dealing with suspected or actual cases of unlawful interference.

(4) The authority shall ensure that contingency plans are developed and resources made available to safeguard civil aviation against acts of unlawful interference and the contingency plans shall be tested on a regular basis.

(5) The authority shall ensure that the National Civil Aviation Security Programme defines processes for the reporting of information concerning incidents of acts of unlawful interference and preparatory acts thereto, by any entity responsible for the implementation of the National Civil Aviation Security Programme in a practical and timely manner to the relevant authorities, as appropriate.

51. Response by authority to acts of unlawful interference

The authority shall —

- (a) take appropriate measures for the safety of passengers and crew of an aircraft which is subjected to an act of unlawful interference while on the ground until their journey can be continued;
- (b) collect all pertinent information on the flight which is the subject of an act of unlawful interference, and transmit that information to all other States responsible for the Air Traffic Services units concerned, including those at the airport of known or presumed destination, so that timely and appropriate safeguarding action may be taken en-route and at the known, likely or possible destination of the aircraft;
- (c) provide assistance to an aircraft subjected to an act of unlawful seizure, including the provision of navigation aids, air traffic services and permission to land as may be necessitated by the circumstances;
- (d) to the extent practicable detain, on the ground an aircraft subjected to unlawful seizure which has landed in Ugandan territory unless its departure is necessitated by the overriding duty to protect human lives in making this decision consultations shall be made, where practicable, with the State of the Operator of the aircraft subjected to an act of unlawful seizure and notification to the States of assumed or stated destination;

- (e) notify the State of registry of an aircraft and the State of the operator of the landing aircraft subjected to an act of unlawful interference, and shall similarly transmit, by the most expeditious means, all other relevant information to—
 - (i) the State of registry and the State of the operator of the aircraft;
 - (ii) each State whose citizens suffered fatalities or injuries;
 - (iii) each State whose citizens were detained as hostages;
 - (iv) each State whose citizens are known to be on board the aircraft; and
 - (v) the International Civil Aviation Organisation;
- (f) ensure that information received as a consequence of action taken in accordance with paragraph (b) is distributed locally to the air traffic services units concerned, the appropriate airport administrations, the operator and others concerned as soon as practicable;
- (g) cooperate with other States for the purpose of providing a joint response in connection with an act of unlawful interference; and
- (h) when taking measures in Ugandan territory to free passengers and crew members of an aircraft subjected to an act of unlawful interference, shall use, as necessary, the experience and capability of the State of the Operator, State of manufacture and State of Registry of that aircraft.

52. Exchange of information and mandatory reporting

(1) The authority shall exchange information with other Contracting States as considered appropriate on the management of

response to an act of unlawful interference, at the same time supplying such information to International Civil Aviation Organisation.

(2) An operator shall, where an act of unlawful interference occurs, immediately notify the authority.

(3) An aircraft operator, pilot in command, airport operator or air navigation service provider shall submit to the authority—

- (a) a preliminary written report, within fifteen days after the occurrence of an act of unlawful interference, including sabotage, threats, hijacks, incidents and disruptive passengers; and
- (b) a written report, upon completion of investigations, within thirty days after the occurrence of an act of unlawful interference, including sabotage, threats, hijacks, incidents and disruptive passengers.

53. Notification to International Civil Aviation Organisation

(1) The authority shall, where an act of unlawful interference has occurred, provide the International Civil Aviation Organisation with all pertinent information concerning the security aspects of the act of unlawful interference as soon as practicable after the act is resolved—

- (a) a preliminary report, within thirty days after the occurrence of the act, containing all pertinent information concerning the security aspects of the occurrence; and
- (b) a final report, within sixty days after completion of investigations.

(2) The reports in subregulation (1) (a) and (b) shall be in accordance with International Civil Aviation Organisation Doc 8973, Appendix 42- official report form.

(3) The authority shall provide copies of reports submitted to the International Civil Aviation Organisation under this regulation to other States which may have an interest.

PART VI— FACILITATION

54. Entering or departing aircraft

The authority shall coordinate with other relevant authorities in the application of narcotics control measures and procedures aimed at the efficient clearance of—

- (a) entering or departing aircraft; and
- (b) border controls for passengers and crew.

55. Travel document coordination

The authority shall liaise with a competent authority with regard to the issuance of all passports and other travel documents and shall ensure that they are machine readable in accordance with the specifications of International Civil Aviation Organisation Doc 9303.

56. Inspection of travel documents

The authority shall ensure that aircraft operators —

- (a) conduct an evaluation of travel documents presented by passengers, in order to deter fraud and abuse; and
- (b) take necessary precautions at the point of embarkation to ensure that persons are in possession of the documents prescribed by the competent authority and other relevant authorities of transit and destination for control purposes.

57. Entry and departure procedures and responsibilities

(1) The authority shall where applicable, liaise with a competent authority to ensure the seizure of—

- (a) fraudulent, falsified or counterfeit travel documents; and
- (b) travel documents of a person impersonating the rightful holder of the travel documents.

(2) The documents referred to in subregulation (1) shall be removed from circulation immediately and returned to the appropriate authority of the State named as issuer or to the resident diplomatic mission of that State, except in cases where the competent authority retains the documents for law enforcement purposes.

(3) The Appropriate Authorities of the State named as issuer or the diplomatic mission of that State shall be notified of documents retained by the competent authority that seized the travel document.

(4) The provisions referred to under subregulations (1), (2) and (3) shall be applied at any point during a passenger's journey, including at the point of departure (origin) and at transit or transfer points.

58. Advance passenger information

(1) Aircraft operators operating in the territory of Uganda shall provide advance passenger information to appropriate national authorities in order to detect the departure from their territories or attempted entry into or transit through their territories by means of civil aircraft.

(2) The authority shall ensure that internationally recognised standards for the transmission of advance passenger information are adhered to.

59. Identification and entry of crew and other aircraft operator personnel

The authority shall ensure that—

- (a) a crew member certificate is issued to a crew member after a background check has been carried out including—
 - (i) certification of the employment status of an applicant prior to issuance; and
 - (ii) the issuing of personnel controls and accounts for blank card stock; and

- (b) adequate controls on the issuance of crew member certificates and other official crew identity documents are put in place to prevent fraud.

60. Entry and departure of cargo

The authority shall coordinate with the relevant authority to ensure—

- (a) the use of risk management to determine the extent of examination of goods;
- (b) that programmes for authorised economic operators include measures that enhance security to create an environment for facilitative customs control measures;
- (c) the establishment of agreements or arrangements for the mutual recognition of respective authorised economic operators or equivalent programmes with other States;
- (d) the use of the available advance cargo information in subsequent import, export or transit customs procedures for the release and clearance of the goods;
- (e) the introduction of arrangements to enable all parties involved in air cargo operations to submit all the information required by a competent authority, in connection with the arrival, stay and departure of an aircraft and air cargo, to a single window;
- (f) that all participants in the transport, handling and clearance of air cargo, simplify relevant procedures and documents and cooperate or participate directly in the development of electronic air cargo community systems using internationally agreed standards to enhance the exchange of information relating to traffic and assuring interoperability between the systems;
- (g) the establishment of special procedures for the expedited release or clearance of goods on pre-arrival or pre-departure of authorised persons meeting specified criteria, which may include an appropriate record of

compliance with official requirements and a satisfactory system for managing their commercial records; and

- (h) that goods not afforded the special procedures are released or cleared promptly on arrival, subject to compliance with customs and other requirements.

61. Inadmissible persons

Where a competent authority has reason to believe that an inadmissible person might offer resistance to his or her removal, the competent authority shall inform the aircraft operator concerned in advance of the scheduled departure so that the aircraft operator can take precautions to ensure the safety and security of the flight.

62. Deportees

(1) Where a competent authority removes a deportee from its territory, the competent authority shall assume all the obligations, responsibilities and costs associated with the removal.

(2) A competent authority shall, when making arrangements with an aircraft operator for the removal of a deportee, make available the following information within 24 hours before the scheduled time of departure of the flight—

- (a) a copy of the deportation order where applicable;
- (b) a risk assessment by the State or any other pertinent information that would help the aircraft operator assess the risk to the safety and security of the flight; and
- (c) the names and nationalities of any person escorting the deportee.

(3) The aircraft operator and or the pilot-in-command shall have the option to refuse to transport a deportee on a specific flight when reasonable concerns relating to the safety and security of the flight in question exist.

63. National Air Transport Facilitation Programme

There is established the National Air Transport Facilitation Programme based on the facilitation requirements on the Convention on International Civil Aviation and Annex 9 of the International Civil Aviation Organisation.

64. Composition of National Air Transport Facilitation Committee

(1) There is established a National Air Transport Facilitation Committee for the purpose of coordinating facilitation activities between departments, agencies and other organisations concerned with or responsible for various aspects of civil aviation operations.

(2) The National Air Transport Facilitation Committee shall be composed of senior officials representing the main interests involved in the various aspects of facilitation.

(3) The following persons from the entities specified below shall be members of the National Air Transport Facilitation Committee—

- (a) the ministry responsible for civil aviation;
- (b) the authority;
- (c) the ministry responsible for plant health, veterinary services and fisheries;
- (d) the department responsible for customs;
- (e) the department responsible for immigration services;
- (f) aviation police;
- (g) the ministry responsible for foreign affairs or protocol division;
- (h) the ministry responsible for trade;
- (i) the ministry responsible for health;
- (j) the ministry responsible for tourism;
- (k) ground handling agencies;

- (l) aircraft operators;
- (m) national intelligence agencies;
- (n) the ministry responsible for defence; and
- (o) the department responsible for regulation of communication.

65. Functions of National Air Transport Facilitation Committee

The functions of the National Air Transport Facilitation Committee shall include—

- (a) the implementation of the National Air Transport Facilitation Programme;
- (b) the facilitation of co-operation between all stakeholders in the airport environment;
- (c) the review of policy matters in relation to clearance formalities applied to international air transport services and ensuring that passengers and cargo are cleared through airports in accordance with best international practice;
- (d) the consideration of recommendations made by airport facilitation committees established at international airports;
- (e) making recommendations to the departments, relevant authorities and other organisations concerned with the National Air Transport Facilitation Programme;
- (f) keeping the departments, relevant authorities and other organisations concerned informed of significant developments in the field of international civil aviation, in so far as they affect operations into and out of a particular State;
- (g) addressing differences between national regulations and international standards of Annex 9-Facilitation;
- (h) advising on the use of new technology and integrating mechanisms to ensure the smooth passage of aircraft, passengers and cargo into and out of the State;

- (i) carrying out periodic inspection tours of airports to make assessment on facilitation matters;
- (j) coordination with the National Civil Aviation Security Committee on security aspects of facilitation;
- (k) coordination with the Directorate of Citizenship and Immigration control to ensure that accurate information about stolen, lost, and revoked travel documents, issued by the State of Uganda is promptly reported to International Criminal Police Organisation for inclusion in the Stolen and Lost Travel Documents-SLTD database; and
- (l) the authority in consultation with airport operators shall ensure that facilities and services provided at international airports are where possible, flexible and capable of expansion to meet traffic growth, an increase in security requirements arising from increased threat or other changes to support boarder integrity measures.

PART VII— OFFENCES AND PENALTIES

66. Offences committed at airports

- (1) A person who, at an airport or its related facilities—
 - (a) assaults, harasses, intimidates or threatens an aviation security officer or authorised person, whether physically or verbally, if the act interferes with the performance of or lessens the ability of the aviation security officer or authorised person to perform his or her duties;
 - (b) refuses to comply with a lawful instruction given by the airport operator or on behalf of the authority by an aviation security officer or authorised person for the purpose of ensuring the safety and security at the airport or of any person or property at the airport or for the purpose of maintaining good order and discipline at the airport;
 - (c) engages in an act of physical violence against an aviation security officer or authorised person on duty;

- (d) tampers or intentionally causes damage to or destroys property at an airport;
- (e) destroys an aircraft in service or causes damage to an aircraft which renders it incapable of flight or which is likely to endanger its safety in-flight;
- (f) takes hostages on board an aircraft on ground or at an airport;
- (g) forcefully enters an aircraft at an airport or on the premises of an aeronautical facility;
- (h) possesses or introduces on board an aircraft or at an airport a weapon or hazardous device or material intended for criminal purposes;
- (i) destroys or damages air navigation facilities or interferes with their operation, where any such act is likely to endanger the safety of the aircraft in-flight;
- (j) communicates information which is known to be false, thereby endangering the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public at an airport or on the premises of a civil aviation facility;
- (k) unlawfully and intentionally uses any device, substance or weapon—
 - (i) to commit an act of violence using any device, substance or weapon against a person at an airport serving international civil aviation, which causes or is likely to cause serious injury or death, if such an act endangers or is likely to endanger safety at that airport;
 - (ii) to tamper or destroy or causes serious damage to the facilities of an airport serving international and domestic civil aviation or aircraft not in service located thereon, or disruption of the services of the airport, if such an act endangers or is likely to endanger safety at that airport; or

- (1) operating physically or remotely interferes with the airline dispatch and loading system, abets or connives to commit an act which affects the normal operations of the facilities at an airport to include but not limited to, fuel siphoning from the aircraft, extortion, pilferage, deployment of screeners without certification,

commits an offence and is liable, on conviction, to a fine not exceeding forty eight currency points or to imprisonment for a term not exceeding seven years, or both.

- (2) An airport operator who fails to notify the authority or other party concerned of a threat under regulation 31 and 32 commits an offence and is liable, on conviction, to a fine not exceeding forty eight currency points or to a term of imprisonment not exceeding seven years, or both.

67. Offences committed on board aircraft

A person who, on board a civil aircraft—

- (a) assaults, harasses, intimidates or threatens a crew member or passenger whether physically or verbally, if the act interferes with the performance of or lessens the ability of the crew member to perform his or her duties;
- (b) disobeys a lawful instruction given by the aircraft Pilot-in-command or on behalf of the aircraft Pilot-in-command by a crew member, for the purpose of ensuring the safety of the aircraft or of any person or property on board or for the purpose of maintaining good order and discipline on board;
- (c) unlawfully seizes an aircraft in flight or on the ground;
- (d) uses an aircraft for the purpose of causing death, serious bodily injury, or serious damage to property or the environment;
- (e) commits an act of violence against a person on board an aircraft in flight, if that act is likely to endanger the safety of that aircraft; or

- (f) places or causes to be placed on an aircraft in service, by any means whatsoever, a device or substance which is likely to destroy that aircraft, or to cause damage to the aircraft that renders it incapable of flight or that is likely to endanger its safety in flight,

commits an offence and is liable, on conviction, to a fine not exceeding one hundred seventy five currency points or to a term of imprisonment not exceeding six years.

68. Offences jeopardising good order and discipline on board aircraft

- (1) A person commits an offence who on board an aircraft—
 - (a) engages in an act of physical violence against a person, sexual assault or child molestation;
 - (b) assaults, intimidates or threatens another person, whether physically or verbally;
 - (c) intentionally causes damage to or destroys property;
 - (d) consumes alcoholic beverages or drugs resulting in intoxication;
 - (e) engages in a disorderly conduct including but not limited to, becoming a public nuisance or exhibiting unruly behaviour; or
 - (f) endangers the safety of the aircraft or of any person on board or if such an act jeopardises the good order and discipline on board the aircraft.

(2) A person who commits an offence under subregulation(1) is liable, on conviction, to a fine not exceeding one hundred seventy five currency points or to imprisonment for a term not exceeding six years, or both.

69. Other offences committed on board aircraft

A person who, on board an aircraft —

- (a) smokes in a lavatory or elsewhere in the aircraft;
- (b) tampers with a smoke detector or any other safety- related device on board the aircraft; or
- (c) operates a portable electronic device when such act is prohibited,

commits an offence and is liable on conviction, to a fine not exceeding fifty currency points or to a term of imprisonment not exceeding one year, or both.

70. Possession of prohibited items or restricted articles

A person who is in unlawful possession of a prohibited item or restricted article at an airport, in a security restricted area, on board an aircraft or at an airport navigation installation or who has with him or her a prohibited item or restricted article contrary to regulation 40 commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to imprisonment for a term not exceeding four years, or both.

71. Entering Security Restricted Areas

A person who, without lawful authority enters a security restricted area commits an offence and is liable on conviction, to a fine not exceeding one hundred currency points or to a term of imprisonment for a term not exceeding four years, or both.

72. Offences relating to airport security permits

- (1) A person who —
 - (a) for the purpose of or in connection with, an application for the issue of an airport security permit; or
 - (b) in connection with continuing to hold an existing airport security permit,

makes a statement which he or she knows to be false in a material particular or makes a statement which is false in a material particular, commits an offence and is liable, on conviction to a fine not exceeding

thirty currency points or to a term of imprisonment not exceeding one year, or both.

(2) A person who uses an airport security permit to gain access to an aircraft, an area of an airport or an air navigation installation when he or she is not entitled to such access or not on official duty, commits an offence and is liable, on conviction, to a fine not exceeding thirty currency points or to a term of imprisonment not exceeding one year, or both.

(3) A person who uses a false or unauthorised airport security permit for the purposes of gaining access to a security restricted area or to an air navigation installation commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to a term of imprisonment not exceeding four years, or both.

(4) A person who—

- (a) fails to comply with any conditions applying to an airport security permit;
- (b) fails to display an airport security permit upon being required to do so by an Aviation Security Officer or authorised person;
- (c) fails to return an airport security permit promptly following its expiry or upon his or her becoming no longer authorised to possess it;
- (d) continues using an airport security permit after it has expired;
- (e) uses a valid permit after he or she is no longer authorised to possess the permit; or
- (f) duplicates the airport security permit with the intention to access the airside and security restricted area,

commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to a term of imprisonment not exceeding four years, or both.

(5) A person who —

- (a) being a holder of an airport security permit, transfers, lends, gives or sells his or her permit to another person to gain access to an aircraft, a security restricted area or an air navigation installation when he or she is not authorised to gain such access; or
- (b) being a person authorised by the authority to issue security permits, issues a security permit to a person who is not authorised to be issued with such a permit to gain access to an aircraft, a security restricted area or an air navigation installation,

commits an offence and is liable, on conviction, to a fine not exceeding one hundred fifty currency points or to a term of imprisonment not exceeding four years, or both.

73. Failure to establish and maintain security programmes

A person who operates without a security programme referred to in regulations 15, 16, 17, 18, 19 and 25 or fails to implement a security programme or a training programme commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to imprisonment for a term not exceeding four years, or both.

74. Obstructing authorised persons

A person who —

- (a) obstructs a person acting under a power conferred by these Regulations;
- (b) pretends to be a person acting under a power conferred by these Regulations; or
- (c) refuses to obey any order or reasonable request of a police officer or an aviation security officer, acting in the execution of his or her duty,

commits an offence and is liable on conviction to a fine not exceeding one hundred currency points or to a term of imprisonment not exceeding four years, or both.

75. Offences by body corporate

(1) Where an offence under these Regulations is committed by a body corporate and is proved to have been committed with the consent or connivance of, or is attributable to any neglect on the part of—

- (a) any director, manager, secretary or similar officer of the body corporate; or
- (b) any person who was purporting to act in any such capacity, that person, as well as the body corporate,

commits an offence and is liable to be prosecuted and punished accordingly.

(2) A person who commits an offence under subregulation (1), is liable on conviction either in substitution for or in addition to the fine prescribed under the relevant regulation to imprisonment not exceeding the equivalent of imprisonment to the fine prescribed by the relevant section calculated on the basis of one hundred and twenty currency points being equivalent to imprisonment for five years.

76. Failure to comply with circulars, notices, directives, orders and Regulations

A person who contravenes any circulars, notices, directives, orders, rules, instructions or any other specific operating requirements containing details to ensure the consistent application of aviation security measures and these Regulations commits an offence and is liable on conviction, except where any other penalty is provided, to a fine not exceeding thirty currency points or to a term of imprisonment not exceeding one year, or both.

77. Jurisdiction

(1) Uganda shall have jurisdiction over any act constituting an offence under regulations 50(1) (b) 72, 73 and 74 if the act took place on board—

- (a) an aircraft registered in Uganda;
- (b) an aircraft leased, with or without crew, to a lessee whose principal place of business is in Uganda or, if the lessee does not have a principal place of business, whose permanent residence is in Uganda;
- (c) an aircraft on or over the territory of Uganda; or
- (d) any other aircraft in flight outside Uganda, if the next landing of the aircraft is in Uganda, and the Pilot-In-Command has —
 - (i) delivered the suspected offender to the competent authorities in accordance with regulation 80 (3);
 - (ii) requested Uganda to prosecute the suspected offender; and
 - (iii) affirmed that no similar request has been or will be made by the Pilot-In-Command or the aircraft operator to any other contracting State.

(2) For the purposes of this regulation, an aircraft is deemed to be “in flight” at any time from the moment when all its external doors are closed following embarkation until the moment when any such door is opened for disembarkation and in the case of forced landing, the flight shall be deemed to continue until the competent authorities take over the responsibility for the aircraft and for persons and property on board.

PART VIII—ENFORCEMENT OF REGULATIONS

78. Unidentified baggage

Where a police officer or an aviation security officer has reasonable cause to suspect that an item of baggage or any other object may constitute a security risk, whether because it is suspicious, unidentified or unattended or for any other reason, that officer may, after subjecting the baggage to security controls, including rendering safe, investigation

and evaluation to ascertain the absence of explosives, remove the item of baggage or object and destroy it.

79. Power to stop passengers travelling

Where a police officer or an aviation security officer has reasonable cause to suspect that a person—

- (a) is about to embark on an aircraft in Uganda; or
- (b) is on board an aircraft in Uganda,

and that, that person intends to commit an offence that amounts to an act of unlawful interference, the police officer may, with the approval of the police officer in charge at the airport or in case of an aviation security officer, with the approval of the officer in charge of the airport, prohibit that person from travelling on board the aircraft by—

- (i) preventing him or her from embarking on the aircraft;
- (ii) removing him or her from the aircraft; or
- (iii) in case of aviation security officer, arresting him or her without a warrant and immediately handing him or her to the police for appropriate action.

80. Powers and responsibilities of Pilot-In-Command

(1) The Pilot-In-Command shall have the power and responsibility and where necessary seek assistance from crew or passengers to—

- (a) protect the safety of persons and property on board;
- (b) restrain persons on board who may be a threat to safety;
- (c) disembark persons who may be a threat to safety;
- (d) search persons and baggage on an aircraft and take possession of items which could be used in connection with any act of unlawful interference;
- (e) notify authorities of Uganda as soon as practicable, before landing, in the territory of Uganda; and

- (f) provide the authorities of Uganda with evidence and information regarding the incident that necessitated the restraint or disembarkation of a passenger.

(2) In case of a severe threat to safety by a disruptive or unruly passenger on board, the Pilot-In-Command may land at the nearest suitable airport and disembark the passenger in consultation with the local authorities.

(3) The police or person in charge of the airport shall accept delivery of a person disembarked in accordance with subregulation (2) for appropriate action.

81. Powers of Aviation Security Officer

An aviation security officer shall have the power to—

- (a) screen mail, cargo, supplies catering stores and supplies, persons and their personal effects, hold baggage, carry-on baggage and vehicles;
- (b) prevent unauthorised persons and vehicles from accessing a security restricted area;
- (c) prevent unauthorised persons from accessing aircraft; and
- (d) arrest any person who commits or attempts to commit an offence under these Regulations.

82. Power to exempt

(1) The authority may exempt any person to whom these Regulations apply from the application of these Regulations except that the exemption shall not violate the standards prescribed by the International Civil Aviation Organisation, international laws, International Conventions, Protocols and UN resolutions.

(2) The authority may exempt any airport or category of airports to which these Regulations apply from the application of these Regulations and may impose conditions for such exemptions.

(3) An exemption granted under subregulation (1) or (2) shall be published in the Gazette and in a newspaper of wide circulation in Uganda within fourteen days after it is granted.

83. Power to enforce compliance

(1) The authority or any authorised person may, for purposes of ensuring the implementation of the National Aviation Security Quality Control Programme or the requirements of the National Civil Aviation Security Programme, or any other operator security programme, or requirements set out under these Regulations, and without prejudice to the provisions of Part VIII of these Regulations, adopt measures and procedures for aviation security monitoring and enforcement approved by the National Aviation Security Committee.

(2) The procedures referred to in subregulation (1) shall establish enforcement to ensure rectification of any matter, including but not limited to the following—

- (a) failure to comply with any order, circular, rules or directive and instructions issued under these Regulations;
- (b) failure to comply with any requirement set out under the National Civil Aviation Security Programme or the respective operator security programme;
- (c) failure to comply with an oversight recommendation made by the authority; or
- (d) failure to take into account unique or exceptional circumstances which, although not expressly provided under the National Civil Aviation Security Programme, or the respective operator security programme may expose an airport, air navigation services providers facility, aircraft or catering facility to risk.

(3) The authority or any authorised person may, without limiting the generality of this regulation, issue infringement notices set out in Part IX of these Regulations for serious or prolonged breaches of security or failure to rectify security lapses that may endanger the safety of civil aviation.

(4) An infringement notice may require that the operations of a particular operator be halted until the breach has been rectified.

PART IX—INFRINGEMENT NOTICES

84. Purpose and effect of infringement notices

(1) The purpose of this Part is to create a system of infringement notices for offences against these Regulations as an alternative to prosecution.

(2) “Infringement notice” means an express penalty issued by the authority to a person who commits an offence under these Regulations as an alternative to prosecution.

(3) This Part does not—

- (a) require an infringement notice to be issued to a person for an offence;
- (b) affect the liability of a person to be prosecuted for an offence if an infringement notice is not issued to the person for the offence;
- (c) prevent the issue of two or more infringement notices to a person for an offence; or
- (d) affect the liability of a person to be prosecuted for an offence if the person does not comply with an infringement notice for the offence.

85. Penalty payable under infringement notice

The penalty for an offence payable under an infringement notice issued to the person for the offence is one-fifth of the maximum penalty that a court may impose on the person for the offence.

86. Authorised person to issue infringement notice

(1) Where an authorised person has reason to believe that a person has committed an infringement notice offence, the authorised person may issue an infringement notice, to the person for the offence.

(2) An authorised person who improperly issues an infringement notice or who issues an infringement notice for any purpose other than to ensure aviation security commits an offence and is liable, on conviction, to a fine not exceeding one hundred currency points or to a term of imprisonment not exceeding four years or both.

87. Issue of infringement notice

- (1) An infringement notice shall—
- (a) bear a unique number;
 - (b) state the name of the authorised person who issued it;
 - (c) state the date of issue;
 - (d) state the full name or the surname and initials, and the address, of the person to whom it is issued;
 - (e) give brief details of the offence for which it is issued, including—
 - (i) the date and time of commission of the offence;
 - (ii) where the offence was committed; and
 - (iii) the provision of these Regulations contravened;
 - (f) state the penalty for the offence payable under the notice;
 - (g) state where and how that penalty can be paid including, if the penalty can be paid by posting the payment, the place to which it should be posted;
 - (h) state that if the person to whom it is issued pays the penalty within twenty-eight days after the day on which the notice is served, or any longer time allowed in writing by an authorised person, then, unless the infringement notice is subsequently withdrawn and any penalty paid refunded—
 - (i) any liability of the recipient for the offence shall be discharged;

- (ii) the recipient shall not be prosecuted in a court for the offence; and
 - (iii) the recipient shall not be taken to have been convicted of the offence;
- (i) state the greatest penalty that a court could impose on the recipient for the offence;
 - (j) state that if the recipient is prosecuted in court and found guilty of the offence, the recipient may be convicted of the offence and ordered to pay a penalty and costs, and be subject to any other order that the court makes;
 - (k) state how and to whom the recipient can apply to be allowed more time to pay the penalty; and
- (l) be signed by the authorised person who issued it.
- (2) An infringement notice may contain any other information that the authorised person issuing it deems necessary.

88. Service of infringement notice

(1) An infringement notice shall be made directly to the person addressed in the infringement notice, unless he or she has an agent empowered to accept service, in which case service on the agent shall be sufficient.

(2) Where the person addressed in the infringement notice cannot be found, service may be made by an agent of the person addressed who is empowered to accept service or on any adult member of the family of the person addressed in the infringement notice, who is residing with him or her.

(3) Where the authorised officer, after using all due and reasonable diligence, cannot find the person to be served, or any person on whom service can be made, the authorised officer shall affix a copy of the infringement notice on the outer door or some other conspicuous part of the house in which the person to be served ordinarily resides or

carries on business or personally works for gain, and shall then return the original to the authority with a report endorsed on it or annexed to it stating that he or she has so affixed the copy, the circumstances in which he or she did so, and the name and address of the person, if any, by whom the house was identified and in whose presence the copy was affixed.

(4) An authorised officer shall, in all cases in which the infringement notice has been served under these Regulations, fill out a report of such service or annex or cause to be annexed to the original infringement notice, a report stating the time when and the manner in which the infringement notice was served, and the name and address of the person, if any, identifying the person served.

(5) Where for any reason the infringement notice cannot be served in the ordinary way, the authority may order the authorised officer to serve the infringement notice by affixing a copy in a conspicuous place on the notice board of the authority, and also upon a conspicuous part of the house, if any, in which the person to be served is known to have carried on business or personally worked for gain, or in such other manner as the authority deems fit.

(6) Substituted service under subregulation (5) shall be as effectual as if it had been made on the person to be served personally.

(7) An infringement notice may be served on a corporation—

- (a) by leaving it at, or by sending it by registered post or address to the head office, a registered office or a principal office of the Corporation; or
- (b) by giving it, at an office mentioned in paragraph (a), to someone who is, or to whom the authorised person who issued it has reason to believe is, an officer or employee of the Corporation.

89. Time for payment of penalty

The penalty stated in an infringement notice shall be paid—

- (a) within twenty-eight working days after the day on which the notice is served on the person to whom it is issued;
- (b) if the person applies for a further period of time in which to pay the penalty, and that application is granted, within the further period allowed;
- (c) if the person applies for a further period of time in which to pay the penalty and the application is refused, within seven days after the notice of the refusal is served on the person; and
- (d) if the person applies for the notice to be withdrawn and the application is refused, within twenty-eight working days after the notice of the refusal is served on the person.

90. Extension of time to pay penalty

(1) The person to whom an infringement notice is issued may apply, in writing, to the authority for a further period of up to twenty-eight days in which to pay the penalty stated in the notice.

(2) The authority shall, within fourteen days after receiving the application —

- (a) grant or refuse a further period not longer than the period sought; and
- (b) notify the recipient in writing of the decision and, if the decision is a refusal, the reasons for it.

(3) Notice of the decision may be served on the recipient in any manner in which the infringement notice could have been served on the recipient.

91. Effect of payment of penalty

(1) Where an infringement notice is not withdrawn, and the person to whom it is issued pays the penalty stated in the notice —

- (a) any liability of the person for the offence is discharged;
- (b) the person shall not be prosecuted in a court for the offence; and
- (c) the person is not taken to have been convicted of the offence.

(2) Where two or more infringement notices are issued to a person for the same offence, the person's liability to be prosecuted for the offence ceases if the person pays the penalty stated in any of the notices.

92. Withdrawal of infringement notice

(1) A person may apply in writing to the authority, before the end of twenty eight days after receiving an infringement notice, for the infringement notice to be withdrawn.

(2) The authority shall, within fourteen days after receiving the application—

- (a) withdraw or refuse to withdraw the notice; and
- (b) notify the person in writing of the decision and, if the decision is a refusal, the reasons for the decision.

(3) Where the authority has not approved, or refuses to approve, the withdrawal of the notice within the period allowed by subregulation (2), the authority is taken to have refused to approve the withdrawal of the notice.

(4) The authority shall, before withdrawing or refusing to withdraw a notice, consider —

- (a) whether the person has been convicted previously of an offence against these Regulations;
- (b) the circumstances of the offence stated in the notice;
- (c) whether the person has previously paid a penalty under an infringement notice issued to the person for an offence of the same type as the offence mentioned in the notice; and
- (d) any other relevant matter.

(5) The authority may withdraw an infringement notice without an application having been made.

93. Notice of withdrawal of infringement notice

(1) Notice of the withdrawal of an infringement notice may be served on a person in any manner in which the infringement notice could have been served on the person.

(2) A notice withdrawing an infringement notice served on a person for an offence—

(a) shall include the following information—

(i) the full name or surname and initials and address of the person;

(ii) the number of the infringement notice; and

(iii) the date of issue of the infringement notice;

(b) shall state that the notice is withdrawn; and

(c) shall if the authority intends to prosecute the person in court for the offence, state that the person may be prosecuted in court for the offence.

94. Refund of penalty

Where an infringement notice is withdrawn after the penalty stated in it has been paid, the authority may refund the amount of the penalty to the person who paid it, within sixty days after the withdrawal of the notice.

PART X— REVOCATION AND SAVINGS

95. Revocation of S.I No. 24 of 2017 and savings

(1) The Civil Aviation (Security) Regulations, 2017 are revoked.

(2) A licence, certificate, authorisation, permit, exemption or other approval granted under these Regulations revoked by subregulation (1) shall remain in force until its expiry, revocation or replacement as if granted under these Regulations.

SCHEDULE

*Regulations 6, 66,67,68,69,70,71,
72,73,74,75 and 76*

CURRENCY POINT

One currency point is equivalent to twenty thousand shillings.

GEN. EDWARD KATUMBA – WAMALA (MP)
Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 80

**THE CIVIL AVIATION (CERTIFICATION OF AIR NAVIGATION
SERVICES) REGULATIONS, 2022**

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SCHEDULE 1 — CURRENCY POINT

SCHEDULE 2 — AIR NAVIGATION SERVICE PROVIDER (ANSP) –
APPLICATION FORM

STATUTORY INSTRUMENTS

2022 No. 80

The Civil Aviation (Certification of Air Navigation Services) Regulations, 2022

(Under sections 34(2) and 61 of the Civil Aviation Authority Act, (Cap. 354)

IN EXERCISE of the powers conferred upon the Minister by sections 34(2) and 61 of the Civil Aviation Authority Act, and on the recommendation of the Uganda Civil Aviation Authority, these Regulations are made this 22nd day of December, 2021.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Certification of Air Navigation Services) Regulations, 2022.

2. Application

These Regulations apply to a person who provides air navigation services within a designated airspace and at aerodromes.

3. Interpretation

In these Regulations unless the context otherwise requires—

“Act” means the Civil Aviation Authority Act, Cap. 354;

“aerodrome” means a defined area on land or water including buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;

“aeronautical information” means information resulting from the assembly, analysis and formatting of aeronautical data;

“Aeronautical Information Service (AIS)” means a service established within the defined area of coverage responsible for the provision of aeronautical information or data necessary for the safety, regularity and efficiency of air navigation;

“aircraft” means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface;

“air navigation service” means services provided to air traffic during all phases of operation including air traffic management, communication, navigation and surveillance, meteorological services for air navigation, search and rescue, aeronautical information services and construction of instrument flight procedures;

“air navigation services facility” means a facility used, available for use, or designed for use in aid of navigation of aircraft, including airports, landing fields, any structures, mechanisms, lights, beacons, marks, communication systems, or other instruments or devices used or useful as an aid to the safe taking off, navigation, and landing of aircraft and any combination of such facilities;

“air navigation services provider (ANSP)” means the entity responsible for the provision of air navigation services;

“air traffic” means all aircraft in flight or operating on the manoeuvring area of an aerodrome;

“air traffic control service” means a service provided for the purposes of—

- (a) preventing collisions—
 - (i) between aircraft; and
 - (ii) on the manoeuvring area between aircraft and obstructions; or

(b) expediting and maintaining an orderly flow of air traffic;

“air traffic service” means flight information service, alerting service, air traffic advisory service, air traffic control service; area control service, approach control service or aerodrome control service;

“authority” means the Uganda Civil Aviation Authority established under section 3 of the Act;

“certificate” means the air navigation service provider certificate issued by the Authority under these Regulations;

“controlled aerodrome” means an aerodrome from which air traffic control service is provided to aerodrome traffic;

“currency point” has the meaning assigned to it under Schedule 1 of these Regulations;

“Manual of Air Navigation Services Operations (MANSOPS)” means a document that contains all information and instructions necessary to enable the personnel of the ANSP perform their duties;

“Safety Management System (SMS)” means a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures;

“search” means an operation normally co-coordinated by a rescue co-ordination centre or rescue sub-centre using available personnel and facilities to locate persons in distress;

PART II—CERTIFICATION OF AIR NAVIGATION
SERVICE PROVIDER

4. Requirements for provision of air navigation services

(1) A person shall not provide air navigation services unless the person holds a certificate issued by the authority under these Regulations.

(2) Subject to subregulation (1), a provider of—

- (a) air traffic services;
- (b) communication, navigation and surveillance systems;
- (c) meteorological services for air navigation;
- (d) aeronautical search and rescue coordination services;
- (e) aeronautical information services;
- (f) aeronautical charts; or
- (g) construction of instrument flight procedures;

shall be issued with certificates in accordance with these Regulations.

(3) The air navigation services shall be provided in accordance with—

- (a) the requirements in these Regulations;
- (b) the procedures specified in the MANSOPS; and
- (c) any other requirements issued by the authority for the safety of air navigation services.

5. Application for certificate

(1) An application for an ANSP certificate shall be made to the authority using the ANSP application form set out in Schedule 2 of these Regulations.

(2) An application for an ANSP certificate shall be accompanied by—

- (a) a MANSOPS of the applicant;
- (b) a written statement setting out the air navigation services and locations from which the services shall be provided;
- (c) the safety management system manual of the applicant;
- (d) the quality management system manual of the applicant;
- (e) evidence that the applicant has the requisite financial capacity to provide the air navigation services;
- (f) a valid insurance policy in respect of the air navigation services to be provided by the applicant; and
- (g) evidence of payment of the prescribed fees by the applicant.

6. Issuance of certificate

(1) The authority shall, before issuing a certificate of air navigation, satisfy itself that the—

- (a) applicant has an adequate number of personnel with the requisite competences to provide the air navigation services that the applicant is applying for;
- (b) MANSOPS accompanying the application contains all the required information;
- (c) facilities, services and equipment of the applicant conform to these Regulations and meet the requirements set out in other applicable Civil Aviation Regulations;
- (d) operating procedures of the applicant contain sufficient provisions for the safety of an aircraft;
- (e) applicant has an appropriate safety management system;
- (f) applicant has an approved quality management system;
- (g) applicant complies with the requirements of the Civil Aviation (Security) Regulations, 2022;

- (h) applicant has sound financial capacity to provide the services that he or she is applying for; and
- (i) applicant has an appropriate insurance policy for the services that he or she intends to provide.

(2) The authority may set other conditions deemed necessary.

(3) The authority may refuse to grant a certificate to an applicant if it finds that the applicant does not meet the requirements of these Regulations.

(4) Where the authority refuses to grant a certificate to an applicant, the authority shall inform the applicant of the reasons for the refusal in writing.

7. Contents of certificate

The ANSP certificate issued under these Regulations shall contain—

- (a) the name, mailing address and principal place of business of the service provider;
- (b) the type of services to be provided by the service provider;
- (c) the location of services to be provided;
- (d) the portion of the aerodrome and the airspace where the services are to be provided;
- (e) any other conditions upon which approval of the certificate is to be based; and
- (f) the commencement and expiry dates of the certificate.

8. Validity of certificate

A certificate issued under these Regulations shall be valid for a period of two years from the date of issuance, unless the certificate is surrendered, amended, suspended or cancelled in accordance with these Regulations.

9. Renewal of certificate

(1) The holder of a certificate of air navigation services may apply to the authority, for renewal of the certificate using the ANSP application form set out in Schedule 2 of these Regulations.

(2) An application for renewal of the certificate shall be submitted to the authority not later than ninety days before the expiry of the certificate.

(3) The application for renewal of the certificate shall be accompanied by—

- (a) the MANSOPS where significant changes have been made to the MANSOPS from the date of issuance of the initial certificate; and
- (b) evidence of payment of the prescribed fees.

(4) The renewal of an ANSP certificate shall be subject to compliance with these Regulations and any other conditions specified and notified by the authority.

10. Surrender of certificate

(1) The holder of a certificate may surrender the certificate to the authority, subject to subregulation (2) and any conditions set by the authority.

(2) The holder of a certificate who wishes to surrender the certificate shall notify the authority in writing, within not less than one hundred eighty days from the date on which the certificate is to be surrendered.

(3) The ANSP shall cease to provide the services set out in the certificate unless authorised to continue providing the services by the authority in writing, upon expiry of the period referred to in subregulation (2).

11. Amendment of certificate

(1) The authority may amend or modify a certificate—

- (a) to correct errors or omissions;
- (b) upon request made by the holder of a certificate; or
- (c) where the authority deems it necessary;

(2) The holder of a certificate shall for the purpose of subregulation (1) (a) make an application to the authority using the ANSP application form specified in Schedule 2 and shall—

- (a) attach two copies of the proposed amendments to the MANSOPS; and
- (b) attach evidence of payment of the prescribed fees.

(3) Where the amendment to the certificate is initiated by the authority, the authority shall inform the holder of the certificate about the amendment and the holder of the certificate shall make the necessary amendments in the MANSOPS within the time specified by the authority.

12. Display of certificate

(1) The holder of a certificate shall display the certificate, or a copy of the certificate, in a conspicuous place, accessible to the public at his or her principal place of business.

(2) Where a copy of the certificate is displayed under subregulation (1), the holder of the certificate shall whenever required show the original certificate to the authority.

13. Transfer of certificate

A certificate issued under these Regulations shall not be transferrable.

14. Suspension, variation and cancellation of certificate

(1) The authority may, upon the completion of an investigation vary or cancel the ANSP certificate issued under these Regulations.

(2) Subject to subregulation (1), the authority may suspend a certificate issued under these regulations for a period not exceeding sixty days.

(3) The authority may suspend a certificate issued under these Regulations, where the authority considers that—

- (a) a provision of the Act or these Regulations, or a condition in the certificate, has not been complied with;
- (b) false or materially incorrect information was given to the authority in the application for the certificate; or
- (c) it is in the public interest to do so.

(4) A holder of an ANSP certificate who has been notified of a suspension under subregulation (1) may submit a response in writing within fourteen days from the date of the suspension.

(5) Notwithstanding subregulation (2), the authority may suspend any or all of the operations of the holder of the ANSP certificate pending receipt of a response from the holder of the certificate.

(6) A holder of a certificate or any person who is in possession or custody of the certificate which has been suspended or cancelled under these Regulations shall surrender the certificate to the authority within fourteen days from the date of suspension or cancellation.

15. Register of certificate holders

- (1) The authority shall keep and maintain a register showing—
- (a) the name of the holder of the certificate;
 - (b) the physical and postal address of the holder of the certificate;
 - (c) the date of issue or renewal of the certificate as the case may be;

- (d) the type of service offered by the holder of the certificate;
- (e) the expiry date of the certificate;
- (f) the date of variation, suspension or cancellation of the certificate, as the case may be; and
- (g) any other particulars requested for by the authority.

(2) The authority shall enter in the register, all the changes in the particulars of the certificate referred to in subregulation (1).

(3) The register shall be a public document and any person may obtain the information entered in the register, with the approval of the authority.

PART III—MANUAL OF AIR NAVIGATION SERVICES
OPERATIONS

16. Requirements for MANSOPS

(1) The MANSOPS submitted to the authority under these Regulations shall be—

- (a) type written;
- (b) signed by the service provider;
- (c) in a format that is easy to review and shall include a list of the amended pages; and
- (d) organised in a manner that facilitates the evaluation and approval process.

(2) The holder of a certificate shall keep not less than one approved copy of the MANSOPS at his or her principal place of business.

17. Contents of MANSOPS

Every MANSOPS shall contain all the information and instructions that are necessary to enable the personnel of the ANSP perform their respective duties and shall include—

- (a) a list of the services to be provided by the ANSP;
- (b) the responsibilities of the personnel of the ANSP;
- (c) information about performance assessment and training of the staff of the ANSP and how that information is tracked;
- (d) the safety management system and quality management system of the service provider;
- (e) the contingency plans to be used in case of development of part or total system failure;
- (f) a statement about compliance with the Civil Aviation (Security) Regulations, 2022, by the ANSP;
- (g) the facilities and equipment of the ANSP and how the facilities and equipment are installed and maintained;
- (h) the procedure for reporting faults and defects;
- (i) a system for maintenance of the documents and records of the service provider;
- (j) the search and rescue responsibilities, co-ordination, operations, plans and procedures;
- (k) the proposed hours of service;
- (l) systems and procedures for the provision of air navigation services; and
- (m) any other information requested for by the authority.

18. Amendment of MANSOPS

(1) For the purposes of maintenance of accurate information in the MANSOPS—

- (a) the holder of the certificate shall whenever necessary, amend the manual; and
- (b) the authority may issue a written directive that requires the holder of a certificate to amend the MANSOPS.

(2) Notwithstanding subregulation (1), the holder of the certificate shall submit the proposed amendment to the authority for approval, before effecting the amendment in the MANSOPS.

19. Continued compliance

A holder of a certificate shall—

- (a) maintain at every office listed in the certificate, a copy of the MANSOPS;
- (b) avail to all his or her personnel parts of the MANSOPS that are relevant to their respective duties;
- (c) comply with all the procedures and processes detailed in the MANSOPS;
- (d) notify the authority of any change of address for service, telephone number, email or facsimile number within twenty eight days from the date on which the change was made; and
- (e) comply with these Regulations and any other conditions deemed necessary and specified by the safety inspections or audits of the authority.

PART IV—AIR NAVIGATION SERVICES

20. Air navigation services facilities and systems

A certified air ANSP shall—

- (a) provide facilities for the provision of air navigation services in the portion of air space and aerodromes designated for that purpose; and

- (b) adopt and put into operation appropriate systems, operational practices and procedures in accordance with the requirements for provision of air navigation services in regulation 4.

21. Safety inspections and audit of air navigation services

(1) The authority shall carry out safety inspections and audits of the air navigation facilities, services, documents and records of the ANSP, for purposes of determining compliance with these Regulations.

(2) The authority may impose operating restrictions or sanctions on the operations of the holder of a certificate, in the event of non-compliance with the requirements in the certificate or an unresolved safety concern.

22. Access to air navigation facilities

An inspector of the authority shall have unrestricted access to the facilities, installations, records and documents of the ANSP, for purposes of determining compliance with these Regulations.

23. Production of documents

The holder of a certificate shall, where requested by an authorised person, produce all the documents under his or her possession, within seventy-two hours from the time of receiving the request.

24. Air navigation services contingency plan

(1) The holder of a certificate shall develop and maintain a contingency plan, for use in the event of an actual disruption or potential disruption, of air navigation services in the airspace for which the holder of the certificate is responsible.

(2) The holder of a certificate shall while developing the contingency plan liaise with other ANSPs in adjacent or contiguous airspaces.

(3) The contingency plan shall include—

- (a) the actions to be taken by the personnel of the certificate holder responsible for providing the service;

- (b) alternative arrangements for providing the service;
- (c) the arrangements for resuming normal operations of the service; and
- (d) any other conditions determined by the authority

(4) The contingency plan for air traffic services shall be developed in accordance with the Civil Aviation (Air Traffic Services) Regulations, 2022.

25. Designated alternative air navigation service provider

(1) The Authority may, where the authority deems it necessary and in public interest, designate an alternative ANSP, for a specified period.

(2) The authority shall designate an alternate ANSP in the case of surrender of the certificate by the holder, or suspension or cancellation of the certificate by the authority.

PART V—GENERAL

26. Replacement of certificate and change of particulars of certificate

(1) The holder of a certificate issued under these Regulations may apply to the authority for—

- (a) replacement of the certificate where the certificate is lost or destroyed;
- (b) change of name on the certificate; or
- (c) an endorsement on the certificate.

(2) The holder of a certificate shall, for purposes of subregulation (1) submit to the authority—

- (a) the original certificate or a copy of the original certificate where the certificate is lost or destroyed; or
- (b) a court order, or other legal document authorising the change of name of the holder of the certificate.

(3) The authority shall, where applicable return to the holder of a certificate, the original certificate, with the appropriate modifications, and retain copies of the certificate.

27. Change of address

The holder of a certificate issued under these Regulations shall notify the authority of any change in his or her physical and mailing address within twenty eight days from the date of occurrence of the change.

28. Personnel requirements

The ANSP shall—

- (a) ensure that all his or her personnel possess the requisite skills, knowledge and competences required to perform the services that he or she is applying for;
- (b) ensure that procedures are established to maintain the required proficiency of the personnel;
- (c) the authority can access the testimonials of the personnel of the ANSP;
- (d) develop job descriptions for all technical staff involved in the provision of the air navigation services;
- (e) develop a training programme for all technical staff which covers initial, on the job, recurrent and specialised training;
- (f) develop annual training plans detailing and prioritising the type of training to be provided, covering recurrent training;
- (g) prior to assigning tasks and responsibilities to new technical staff, ensure that the new technical staff have completed the initial on-the-job training in accordance with the training programme; and
- (h) develop a system for the maintenance of training records for all the air navigation services technical staff.

29. Use and retention of documents and records

- (1) A person shall not use a certificate or exemption—
 - (a) issued under these Regulations, that is forged, altered, suspended or cancelled or which he or she is not entitled to use;
 - (b) that is forged or altered or required under these Regulations;
 - (c) or lend a certificate or exemption issued or required under these Regulations to any other person; or
 - (d) that is mutilated, altered, rendered illegible or destroy any records or an entry made in the record, required to be maintained under these Regulations, or make, procure or assist in the making of, any false entry in such record, or omit to make a material entry in the record.

(2) All records that require to be maintained under these Regulations shall be recorded in a permanent and indelible material.

(3) A person shall not issue the certificate or exemption under these Regulations unless the person is authorised to do so by the authority.

(4) A person authorised by the authority to issue a certificate or exemption, shall not issue the certificate unless he or she is satisfied that all the statements on the certificate or exemption are correct, and that the applicant is qualified to hold that certificate.

30. Report of violation

A person who has information on the violation of these Regulations shall report the violation to the authority.

31. Failure to comply with directive

A person who fails to comply with any directive given to him or her by the authority or by an authorised officer under these Regulations shall be deemed, to have contravened these Regulations.

32. Aeronautical fees

- (1) The authority shall issue a written notice of the fees to be charged—
 - (i) in connection with the issue, renewal or variation of the certificate, test, inspection or investigation required for the purposes of these Regulations; and
 - (ii) on all orders, notices or proclamations made under these Regulations.
- (2) The fees paid under these Regulations are not refundable.

PART VI—OFFENCES AND PENALTIES

33. Contravention of regulations

The authority may suspend or cancel the certificate of a person who contravenes any provision of these Regulations.

34. Penalties

(1) A person who contravenes any provision of these Regulations, is upon conviction, liable to a fine not exceeding twelve currency points or to a term of imprisonment not exceeding six months or both, and in the case of a continuing contravention, each day of the contravention shall constitute a separate offence.

(2) Where it is proved that an act or omission of any person, which would otherwise have been a contravention of a provision of these Regulations by that person was due to a cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention of that provision by that person.

35. Appeal

A person aggrieved with the decision of the authority under these Regulations may, appeal to the appeals tribunal established under section 43 of the act within twenty one days of making the decision.

SCHEDULE 1

Regulation 3

CURRENCY POINT

A currency point is equivalent to twenty thousand Uganda shillings.

SCHEDULE 2

Regulations 5, 9(1) and 11(2)

DIRECTORATE OF SAFETY, SECURITY AND ECONOMIC REGULATION

AIR NAVIGATION SERVICE PROVIDER (ANSP) – APPLICATION FORM

Section A: Particulars of the applicant

| |
|-----------------------------------|
| Name of Person/Organisation |
| Address |
| |
| Location |
| Telephone No. |
| Fax |
| E-Mail |

Section B: Operational details

| | |
|---------------------------------|---|
| Location of proposed operation: | |
| Service(s) to be provided: | Location and coverage of each service: |
| | |
| | |
| Proposed commencement date: | |
| Daily hours of service: | |
| Manual of operations | Provided <input type="checkbox"/> Yes <input type="checkbox"/> No |

| |
|---|
| Are facilities installed and operative? <input type="checkbox"/> Yes <input type="checkbox"/> No |
|---|

Section C: Declaration

| |
|---|
| On behalf of |
| |
| I hereby apply for CAA Certification as an ANSP. |
| Signed: |
| My authority to Act on behalf of the applicant is:..... |
| Name of person making the declaration: |
| Date:/...../..... |

- Note:*
- 1. The application should be submitted to the Uganda Civil Aviation Authority, headquarters.*
 - 2. On submission of this application, a fee shall be paid to the authority to cover the cost of certification.*
 - 3. Documentary evidence in support of all matters in this application may be requested.*

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Cross references

Civil Aviation (Air Traffic Services) Regulations, 2022 S.I. No. 74 of 2022

Civil Aviation (Security) Regulations, 2022 S.I. No. 92 of 2022

GEN. EDWARD KATUMBA-WAMALA (MP)
Minister of Works and Transport

STATUTORY INSTRUMENTS SUPPLEMENT

to The Uganda Gazette No. 50, Volume CXV, dated 12th August, 2022

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S T A T U T O R Y I N S T R U M E N T S

2022 No. 71.

**THE CIVIL AVIATION (AERONAUTICAL INFORMATION SERVICES)
REGULATIONS, 2022**

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STATUTORY INSTRUMENTS

2022 No. 71.

The Civil Aviation (Aeronautical Information Services) Regulations, 2022

*(Under sections 35 and 61(2)(d) of the Civil Aviation Authority
Act, Cap. 354)*

IN EXERCISE of powers conferred upon the Minister by sections 35 and 61(2)(d) of the Civil Aviation Authority Act and on the recommendation of Civil Aviation Authority, these Regulations are made this 27th day of June, 2022.

PART I—PRELIMINARY

1. Title

These Regulations may be cited as the Civil Aviation (Aeronautical Information Services) Regulations, 2022.

2. Application

- (1) These Regulations apply to —
 - (a) an aeronautical information service provider; and
 - (b) all parties involved in providing aeronautical data.

(2) Notwithstanding subregulation (1), these Regulations do not apply to aeronautical information service provided by the military.

(3) For the avoidance of doubt, these Regulations apply up to the moment the aeronautical data or information is made available by the aeronautical information service provider to the next intended user.

3. Interpretation

In these Regulations unless the context otherwise requires—

“Act” means the Civil Aviation Act, Cap. 354;

- “Aerodrome Mapping Data (AMD)” means data collected for the purpose of compiling aerodrome mapping information;
- “Aerodrome Mapping Database (AMDB)” means collection of aerodrome mapping data organised and arranged as a structured data set;
- “aerodrome” means a defined area on land or water including buildings, installations and equipment intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft;
- “aeronautical information product” means aeronautical data and aeronautical information provided either as digital data sets or as a standardised presentation in paper or electronic media;
- “aeronautical chart” means a representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation;
- “aeronautical data or information originator” means an entity that is accountable for data or information origination and from which the AIS organisation receives aeronautical data and information;
- “aeronautical data” means a representation of aeronautical facts, concepts or instructions in a formalised manner suitable for communication, interpretation or processing;
- “Aeronautical Fixed Service (AFS)” means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services;
- “aeronautical information circular” (AIC) means a notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters;

- “aeronautical information management” (AIM) means the dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties;
- “Aeronautical Information Publication (AIP)” means a publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation;
- “aeronautical information regulation and control” (AIRAC) means a system aimed at advance notification, based on common effective dates, of circumstances that necessitate significant changes in operating practices;
- “aeronautical information service (AIS) provider” means the organisation responsible for the provision of an AIS;
- “Aeronautical Information Service” (AIS), means a service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation;
- “aeronautical information” means information resulting from the assembly, analysis and formatting of aeronautical data;
- “AIP Amendment” means permanent changes to the information contained in the AIP;
- “AIP Supplement” means temporary changes to the information contained in the AIP which are provided by means of special pages;
- “Air Defence Identification Zone (ADIZ)” means special designated airspace of defined dimensions within which an aircraft is required to comply with special identification and reporting procedures additional to those related to the provision of air traffic services;

- “Air Traffic Management (ATM)” means the dynamic, integrated management of air traffic and airspace, including air traffic services, airspace management and air traffic flow management, safely, economically and efficiently, through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions;
- “Air Traffic Services” mean air traffic services and includes Flight Information Service, alerting service air traffic advisory service, air traffic control service, area control service, approach control service and aerodrome control service;
- “application” means manipulation and processing of data in support of user requirements;
- “area navigation (RNAV)” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these aids;
- “area navigation (RNAV) specification” means a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV;
- “ASHTAM” means a special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and volcanic ash cloud that is of significance to aircraft operations;
- “assemble” means a process of merging data from multiple sources into a database and establishing a baseline for subsequent processing;
- “ATS surveillance services” means a term used to indicate a service provided directly by means of an ATS surveillance system;

- “ATS surveillance system” variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft;
- “Authority” means the Uganda Civil Aviation Authority;
- “Automatic Dependent Surveillance – Broadcast (ADS-B)” means, a means by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link;
- “Automatic Dependent Surveillance – Contract (ADS-C)” means, a means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports;
- “Automatic Terminal Information Service (ATIS)” means the automatic provision of current, routine information to arriving and departing aircraft throughout twenty four hours or a specified portion thereof;
- “bare earth” means surface of the earth including bodies of water and permanent ice and snow, and excluding vegetation and manmade objects;
- “calendar” means discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day;
- “canopy” means bare earth supplemented by vegetation height;
- “confidence level” means the probability that the true value of a parameter is within a certain interval around the estimate of its value;
- “Controller-Pilot Data Link Communications (CPDLC)” means a means of communication between controller and pilot, using data link for ATC communications;

- “culture” means all man-made features constructed on the surface of the earth, such as cities, railways and canals;
- “Cyclic Redundancy Check (CRC)” means a mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data;
- “danger area” means an airspace of defined dimensions within which activities dangerous to the flight of an aircraft may exist at specified times;
- “data accuracy” means a degree of conformance between the estimated or measured value and the true value;
- “data completeness” means the degree of confidence that all of the data needed to support the intended use is provided;
- “data format” means a structure of data elements, records and files arranged to meet standards, specifications or data quality requirements;
- “data integrity (assurance level)” means a degree of assurance that an aeronautical data and its value has not been lost or altered since the origination or authorised amendment;
- “Data link-VOLMET (D-VOLMET)” means provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link;
- “data product specification” means a detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party;
- “data product” means a data set or data set series that conforms to a data product specification;

- “data quality” means a degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution, integrity (or equivalent assurance level), traceability, timeliness, completeness and format;
- “data resolution” means a number of units or digits to which a measured or calculated value is expressed and used;
- “data set series” means a collection of data sets sharing the same product specification;
- “data set” means an identifiable collection of data;
- “data timeliness” means the degree of confidence that the data is applicable to the period of its intended use;
- “data traceability” means the degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator;
- “datum” means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities;
- “Digital Elevation Model (DEM)” means the representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum;
- “direct transit arrangements” means special arrangements approved by the public authorities concerned by which traffic which is pausing briefly in its passage through the Contracting State may remain under their direct control;
- “ellipsoid height (geodetic height)” means the height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question;
- “feature attribute” means the characteristic of a feature;
- “feature operation” means operation that every instance of a feature type may perform;

- “feature relationship” means relationship that links instances of one feature type with instances of the same or a different feature;
- “feature type” means class of real world phenomena with common properties
- “feature” means abstraction of real world phenomena;
- “geodesic distance” means the shortest distance between any two points on a mathematically defined ellipsoidal surface;
- “geodetic datum” means minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system or frame;
- “geoid undulation” means the distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid;
- “geoid” means the equipotential surface in the gravity field of the earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents;
- “gregorian calendar” means calendar in general use, first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar;
- “height” means the vertical distance of a level, point or an object considered as a point, measured from a specific datum;
- “heliport” means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters;
- “human factors principles” means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

- “integrity classification of aeronautical data” means classification based upon the potential risk resulting from the use of corrupted data;
- “international airport” means an airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out;
- “international NOTAM office (NOF)” means an office designated by a State for the exchange of NOTAM internationally;
- “logon address” means a specified code used for data link logon to an ATS unit.
- “manoeuvring area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons;
- “metadata” means data about data;
- “Minimum En-route Altitude” (MEA) means the altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance;
- “Minimum Obstacle Clearance Altitude” (MOCA) means the minimum altitude for a defined segment of flight that provides the required obstacle clearance;
- “movement area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron;
- “navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace;
- “next intended user” means the entity that receives the aeronautical data or information from the aeronautical information service;

- “NOTAM” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations;
- “obstacle or terrain data collection surface” means defined surface intended for the purpose of collecting obstacle or terrain data;
- “obstacle” means all fixed whether temporary or permanent and mobile objects or parts of the object, that—
- (a) are located on an area intended for the surface movement of aircraft;
 - (b) extend above a defined surface intended to protect aircraft in flight; or
 - (c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation;
- “origination (aeronautical data or aeronautical information)” means the creation of the value associated with new data or information or the modification of the value of existing data or information;
- “orthometric height” means height of a point related to the geoid, generally presented as an MSL elevation;
- “performance-based communication (PBC)” means communication based on performance specifications applied to the provision of air traffic services;
- “Performance-Based Navigation (PBN)” means area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.
- “performance-based surveillance” (PBS) means a surveillance

based on performance specifications applied to the provision of air traffic services;

“portrayal” means presentation of information to humans;

“position (geographical)” means a set of coordinates, latitude and longitude, referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth;

“post spacing” means angular or linear distance between two adjacent elevation points;

“pre-flight information bulletin” (PIB) means a presentation of current NOTAM information of operational significance, prepared prior to flight;

“precision” means the smallest difference that can be reliably distinguished by a measurement process;

“prohibited area” means an airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited;

“quality assurance” means part of quality management focused on providing confidence that quality requirements will be fulfilled;

“quality control” means part of quality management focused on fulfilling quality requirements;

“quality management” means coordinated activities to direct and control an organisation with regard to quality;

“quality” means a degree to which a set of inherent characteristics fulfils requirements;

“radio navigation service” means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids;

“Required Communication Performance (RCP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication;

“Required navigation performance (RNP) specification” means a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, for instance, RNP 4, RNP APCH;

“Required Surveillance Performance (RSP) specification” means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

“requirement” means a need or expectation that is stated, generally implied or obligatory;

“restricted area” means an airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions;

“route stage” means a route or portion of a route flown without an intermediate landing;

“SNOWTAM” means a special series NOTAM given in a standard format providing a surface condition report notifying the presence or cessation of hazardous conditions due to snow, ice, slush, frost, standing water or water associated with snow, slush, ice or frost on the movement area;

“station declination” means an alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated;

“terrain” means the surface of the earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles;

“traceability” means ability to trace the history, application or location of that which is under consideration;

“validation” means confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled;

“verification” means confirmation, through the provision of objective evidence, that specified requirements have been fulfilled;

“Voice-Automatic Terminal Information Service (Voice-ATIS)” means the provision of automatic terminal information service by means of continuous and repetitive voice broadcasts;

“VOLMET” means meteorological information for aircraft in flight;

“VOLMET broadcast” means provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

PART II— COMMON REFERENCE SYSTEMS FOR AIR NAVIGATION

4. Horizontal reference system

(1) The world geodetic system — 1984 (WGS-84) shall be used as the horizontal reference system for air navigation.

(2) The published aeronautical geographical coordinates indicating latitude and longitude shall be expressed in terms of the WGS-84 geodetic reference datum.

5. Vertical reference system

(1) The mean sea level datum shall be used as the vertical reference system for air navigation.

(2) The earth gravitational model — 1996 (EGM-96) shall be used as the global gravity model for air navigation.

(3) At geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation on the basis of EGM-96 data, the regional, national or local geoid models containing high resolution (short wave length) gravity field data shall be developed and used.

(4) When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96 shall be provided in Aeronautical Information Publication.

6. Temporal reference system

(1) The Gregorian calendar and coordinated universal time shall be used as the temporal reference system for air navigation.

(2) Where a different temporal reference system is used for some applications, the feature catalogue, the metadata associated with an application schema or a data set, as appropriate, shall include either a description of that system or a citation for a document that describes that temporal reference system.

PART III—RESPONSIBILITIES AND FUNCTIONS

7. Responsibility of Authority

(1) The Department of Aeronautical Information Management in the authority shall, in accordance with the Act, provide aeronautical information services.

(2) In performing the function of providing aeronautical information services, the Department of Aeronautical Information Management shall be known as the aeronautical information service provider.

(3) The aeronautical data and aeronautical information provided for and on behalf of the authority shall indicate that the data and information are provided under the authorisation of the authority, irrespective of the format in which they are provided.

(4) The authority shall—

(a) ensure that the aeronautical data and aeronautical information provided covers the territory of Uganda for which the authority is responsible for the provision of air traffic services;

(b) be responsible for the aeronautical data and aeronautical information provided in accordance with subregulation (4) (a); and

(c) ensure that the aeronautical data and aeronautical information provided is complete, timely and of required quality in accordance with regulation 14.

(5) The authority shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information and the aeronautical information service provider in relation to the timely and complete provision of aeronautical data and aeronautical information.

8. Responsibilities and functions of aeronautical information service provider

(1) The aeronautical information service provider shall make available, in a form suitable for the operational requirements of the air traffic management community, aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation, including—

- (a) those involved in flight operations, including flight crews, flight planning and flight simulators; and
- (b) air traffic services unit responsible for flight information service and the services responsible for pre-flight information.

(2) Subject to subregulation (1), the aeronautical information service provider shall—

- (a) receive, collate or assemble, edit, format, publish or store and distribute aeronautical data and aeronautical information concerning the entire territory of Uganda;
- (b) provide aeronautical data and aeronautical information as aeronautical information products;
- (c) where 24-hour service is not provided, make available aeronautical information service during the whole period an aircraft is in flight in the area of responsibility of an aeronautical information service, plus a period of at least two hours before and after such a period;
- (d) make available aeronautical information service at such other time as may be requested by an appropriate ground organisation;
- (e) obtain aeronautical data and aeronautical information to enable it to provide pre-flight information service and to meet the need for in-flight information from the aeronautical information services of other States or other sources that may be available;
- (f) clearly identify the aeronautical data and aeronautical information obtained from the aeronautical information service of other States, when distributed, as having the authority of the originating State; and
- (g) if possible, verify before distribution, aeronautical data and aeronautical information obtained from other sources

other than aeronautical information service of other States, and if not verified shall, when distributed, be clearly identified as such.

(3) Notwithstanding subregulation (2), the aeronautical information service provider shall promptly make available to the aeronautical information services of other states, any aeronautical data and aeronautical information necessary for the safety, regularity or efficiency of air navigation required by those states.

9. Exchange of aeronautical data and aeronautical information

Where there is an exchange of aeronautical data and aeronautical information, with other states, the aeronautical information service provider shall—

- (a) designate the office to which all elements of the aeronautical information products provided by other states shall be addressed and shall ensure that the office is qualified to deal with requests for aeronautical data and aeronautical information provided by other states;
- (b) define, where more than one international NOTAM office is designated within Uganda, the extent of responsibility and the territory covered by each office;
- (c) establish formal arrangements with the users of aeronautical data and aeronautical information in relation to the provision of the service;
- (d) arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication;
- (e) wherever practicable, establish direct contact with other providers of aeronautical information services in order to facilitate the international exchange of aeronautical data and aeronautical information;

- (f) except as provided in paragraph (h), avail one copy of each of the following aeronautical information products, where available, upon request by the aeronautical information service of an ICAO contracting state in the mutually-agreed form without charge—
 - (i) aeronautical information publication (AIP), including amendments and supplements;
 - (ii) aeronautical information circulars;
 - (iii) NOTAM; and
 - (iv) aeronautical charts;
- (g) enter into agreement with participating ICAO contracting states and other entities for the exchange of more than one copy of the elements of aeronautical information products and other air navigation documents, including those containing air navigation legislation and regulations;
- (h) provide on the basis of agreement with concerned ICAO contracting states aeronautical information and aeronautical data provided in the form of digital data sets to be used by the aeronautical information service;
- (i) enter into separate agreement with states other than ICAO contracting states and other entities for the procurement of aeronautical data and aeronautical information, including the elements of aeronautical information products and other air navigation documents, including those containing air navigation legislation and regulations; and
- (j) use globally interoperable aeronautical data and information exchange models for the provision of data sets.

10. Copyright and cost recovery

(1) Where a product has been granted copyright protection by a state, the aeronautical information service provider shall—

- (a) make available to a third party that product which has been granted copyright protection by the state and provided to another state, in accordance with regulation 9, on condition that the—
 - (i) third party is aware that the product is copyright protected; and
 - (ii) product is appropriately annotated that it is subject to copyright by the originating State.

(2) For avoidance of doubt, where aeronautical information and aeronautical data is received in accordance with regulation 9(h), the aeronautical information service provider shall not provide digital data sets of the providing State to any third party without the consent of the providing State.

(3) Subject to subregulation (1) and (2), the aeronautical information service provider shall only recover the overhead cost of collecting and compiling aeronautical data and aeronautical information.

PART IV— AERONAUTICAL INFORMATION MANAGEMENT

11. Information management requirements

The aeronautical information service provider shall establish adequate information management resources and processes to ensure the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the air traffic management system.

12. Classification of aeronautical data

(1) Aeronautical data shall be classified as follows—

- (a) routine data which means there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- (b) essential data which means there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- (c) critical data which means there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

(2) Subject to subsection (1), where classification is based upon the potential risk resulting from the use of corrupted data, it shall be known as integrity classification of aeronautical data.

13. Aeronautical data and aeronautical information validation and verification

(1) An aeronautical data originator shall, before submitting data and information to the aeronautical information service, check the material, aeronautical data and information to be issued as part of an aeronautical information product, in order to ensure that all necessary information is included and that the information is correct in detail.

(2) Subject to subregulation (1), the aeronautical information service provider shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information quality requirements are met.

14. Data quality specifications

Where data is in possession of the aeronautical information service provider, the aeronautical information service provider shall—

- (a) ensure that the order of accuracy for aeronautical data is in accordance with the intended use;

- (b) ensure that order of resolution of aeronautical data is commensurate with the actual data accuracy;
- (c) ensure that the integrity of aeronautical data is maintained throughout the data chain from origination to distribution to the next intended user;
- (d) establish procedures based on the applicable integrity classification in order to—
 - (i) for routine data, avoid corruption throughout the processing of the data;
 - (ii) for essential data, assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and
 - (iii) for critical data, assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks;
- (e) ensure and retain traceability of aeronautical data as long as the data is in use;
- (f) ensure timeliness of the aeronautical data by including limits on the effective period of the data elements;
- (g) ensure completeness of the aeronautical data in order to support its intended use;
- (h) ensure that the format of delivered aeronautical data is adequate to ensure that the data is interpreted in a manner that is consistent with its intended use; and

- (i) ensure that specifications concerning the order of the accuracy including confidence level of aeronautical data, the resolution and integrity classification related to aeronautical data are contained in Schedule 1.

15. Data originating requirements

(1) Data shall be collected and transmitted to the aeronautical information service provider in accordance with the accuracy requirements and integrity classification specified in Schedule 1.

(2) For avoidance of doubt, positional data shall be classified as—

- (a) surveyed points such as navigation aid positions, runway threshold;
- (b) calculated points such as mathematical calculations from the known surveyed points of points in space, fixes; or
- (c) declared points such as flight information region boundary points.

(3) Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information service provider in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum.

(4) Geographical coordinates that have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the applicable requirements contained in Schedule 1, shall be identified.

(5) In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions specified in Schedule 2 shall also be published.

16. Data error detection

Subject to regulation 14, the aeronautical information service provider shall—

- (a) use digital data error detection techniques during the transmission and storage of aeronautical data and digital data sets; and
- (b) use digital data error detection techniques in order to maintain the integrity levels of data sets as specified in regulation 14 (d).

17. Use of automation

Subject to these Regulations, the aeronautical information service provider shall—

- (a) apply automation in order to ensure the quality, efficiency and cost effectiveness of aeronautical information services;
- (b) give due consideration to the integrity of data and information when automated processes are implemented and take mitigating steps where risks are identified;
- (c) in order to meet the data quality requirements ensure that automation—
 - (i) enables digital aeronautical data exchange between the parties involved in the data processing chain; and
 - (ii) uses aeronautical information exchange models and data exchange models designed to be globally interoperable.

18. Quality management system

(1) In accordance with these Regulations, the aeronautical information service provider shall—

- (a) implement and maintain a quality management system that encompasses all functions of an aeronautical information service;

- (b) make the execution of the quality management system demonstrable for each function stage;
- (c) apply the quality management to the whole aeronautical information data chain from data origination to distribution to the next intended user; and
- (d) ensure that the established quality management system follows the International Organisation for Standardisation (ISO) 9000 series of quality assurance standards, and is certified by an accredited certification body.

(2) Subject to the quality management system established under subregulation (1) the aeronautical information service provider shall—

- (a) identify the competencies and the associated knowledge, skills and abilities required for each function;
- (b) ensure that the personnel assigned to perform each function are appropriately trained;
- (c) put in place processes to ensure that personnel possess the competencies required to perform specific assigned functions;
- (d) maintain appropriate records so that the qualifications of personnel can be confirmed;
- (e) establish initial and periodic assessments that require personnel to demonstrate the required competencies; and
- (f) use periodic assessments of personnel as a means to detect and correct shortfalls in knowledge, skills and abilities.

(3) A quality management system established under subregulation (1), shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data is traceable throughout the aeronautical information data chain, so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.

(4) The aeronautical information service provider shall ensure that a quality management system established under this regulation provides users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements.

(5) Subject to this regulation, the aeronautical information service provider shall—

- (a) take all necessary measures to monitor compliance with the quality management system in place;
- (b) demonstrate compliance of the quality management system applied by audit;
- (c) initiate action to determine and correct causes of nonconformities without undue delay; and
- (d) ensure that the audit observations and remedial actions are evidenced and properly documented.

19. Human factor considerations

Where human factors are provided or utilised in the organisation of an AIS, design, contents, processing and distribution of aeronautical data and aeronautical information, the aeronautical information service provider shall give due consideration to the integrity of information, where human interaction is required and mitigating steps taken where risks are identified.

PART V— SCOPE OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

20. Scope of aeronautical data and aeronautical information

(1) The aeronautical data and aeronautical information to be received and managed by the aeronautical information service provider shall include the following sub-domains—

- (a) national regulations, rules and procedures;

- (b) aerodromes and heliports;
- (c) airspace;
- (d) ATS routes;
- (e) instrument flight procedures;
- (f) radio navigation aids or systems;
- (g) obstacles;
- (h) terrain; and
- (i) geographic information.

(2) In determining and reporting of aeronautical data, the aeronautical information service provider shall, ensure that the determination and reporting of the aeronautical data is in accordance with the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data.

21. Metadata

(1) The aeronautical information service provider shall collect metadata for aeronautical data processes and exchange points.

(2) Metadata collection shall be applied throughout the aeronautical information data chain, from origination to distribution to the next intended user.

(3) The metadata to be collected under subregulation (1), shall include—

- (a) the names of the organisations or entities performing any action of originating, transmitting or manipulating the data;
- (b) the action performed; and
- (c) the date and time the action was performed.

PART VI— AERONAUTICAL INFORMATION PRODUCTS
AND SERVICES

22. Aeronautical information

(1) Aeronautical information shall be provided in the form of aeronautical information products and associated services.

(2) Aeronautical information products—shall consists of the following elements—

- (a) Aeronautical Information Publication (AIP), including amendments and supplements;
- (b) aeronautical information circulars (AIC);
- (c) aeronautical charts;
- (d) NOTAM; and
- (e) digital data sets;

(3) When aeronautical data and aeronautical information are provided in multiple formats, the aeronautical information service provider shall implement processes to ensure data and information consistency between formats.

23. Aeronautical information in standardised presentation

(1) Aeronautical information provided in a standardised presentation shall include the AIP, AIP Amendments, AIP Supplements, AICs, NOTAM and aeronautical charts.

(2) The AIP, AIP amendment, AIP supplement and AIC shall be provided by the aeronautical information service provider on paper or as an electronic document.

(3) The AIP, AIP amendment, and AIP supplement and AIC when provided as an electronic document (eAIP) shall be in a format that allows for displaying on electronic devices and printing on paper.

24. Aeronautical Information Publication (AIP)

The aeronautical information service provider shall ensure that the Aeronautical Information Publication (AIP) includes—

- (a) a statement of the competent authority responsible for the air navigation facilities, services and procedures covered by the aeronautical information publication;
- (b) the general conditions under which the services or facilities are available for international use;
- (c) the choice made by the authority in each significant case where an alternative course of action is provided for in International Civil Aviation Organisation standards, recommended practices and procedures;
- (d) a list of significant differences between the national regulations and practices of the authority and the related ICAO Standards, recommended practices and procedures, given in a form that would enable a user to differentiate readily between the requirements of the State and the related ICAO provisions; and
- (e) concise, current information relating to, and arranged under, the subject headings listed in the Schedule 2.

25. Aeronautical Information Publication (AIP) supplement

(1) The aeronautical information service provider shall provide a checklist of valid AIP supplements.

(2) Each AIP supplement shall be allocated a serial number which is consecutive and based on the calendar year.

(3) Each AIP supplement shall be provided on distinctive pages allowing for easy identification from the regular Aeronautical Information Publication content.

(4) Whenever an AIP supplement is issued as a replacement of a NOTAM, a reference to the series and number of the NOTAM shall be included.

(5) A checklist of valid AIP supplements shall be issued at intervals of not more than one month as part of the checklist of NOTAM and with distribution as for the Aeronautical Information Publication supplements.

(6) Each AIP Supplement page shall show a publication date.

(7) Each Aeronautical Information Regulation and Control (AIRAC) AIP Supplement page shall show a publication date and an effective date.

(8) When an error in an AIP Supplement or when the period of validity of an AIP Supplement is changed, a new AIP Supplement shall be published as a replacement.

26. Aeronautical Information Circulars (AIC)

(1) An AIC shall be used to provide—

- (a) a long-term forecast of any major change in legislation, regulations, procedures or facilities;
- (b) information of a purely explanatory or advisory nature liable to affect flight safety; or
- (c) information or notification of an explanatory or advisory nature concerning technical, legislative or administrative matters.

(2) For avoidance of doubt, an AIC shall not be used for information that qualifies for inclusion in the AIP or NOTAM.

(3) The validity of an AIC in force shall be reviewed at least once a year.

(4) The aeronautical information service provider shall regularly provide a checklist of valid AIC.

(5) An AIC shall be provided whenever it is desirable to promulgate—

- (a) forecasts of important changes in the air navigation procedures, services and facilities provided;
- (b) forecasts of implementation of new navigational systems;
- (c) significant information arising from aircraft accident or incident investigation which has a bearing on flight safety;
- (d) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;
- (e) advice on medical matters of special interest to pilots;
- (f) warnings to pilots concerning the avoidance of physical hazards;
- (g) effect of certain weather phenomena on aircraft operations;
- (h) information on new hazards affecting aircraft handling techniques;
- (i) regulations relating to the carriage of restricted articles by air;
- (j) reference to the requirements of, and publication of changes in, national legislation;
- (k) aircrew licensing arrangements;
- (l) training of aviation personnel;
- (m) application of, or exemption from, requirements in national legislation;
- (n) advice on the use and maintenance of specific types of equipment;
- (o) actual or planned availability of new or revised editions of aeronautical charts;

- (p) carriage of communication equipment;
- (q) explanatory information relating to noise abatement;
- (r) selected airworthiness directives;
- (s) changes in NOTAM series or distribution, new editions of AIP or major;
- (t) changes in their contents, coverage or format; and
- (u) other information of a similar nature.

(6) Subject to this regulation, the aeronautical information provider shall—

- (a) select the AICs that are to be given international distribution and give them the same distribution as for the AIP;
- (b) allocate each AIC a serial number which shall be consecutive and based on the calendar year;
- (c) separately identify each series of AIC by a letter in the event that they are provided in more than one series;
- (d) issue a checklist of AIC currently in force at least once a year, with distribution as for the aeronautical information circulars; and
- (e) include in the NOTAM a checklist of AIC provided internationally.

27. Aeronautical charts

The aeronautical information service provider shall—

- (a) make available the aeronautical charts listed in subparagraphs (i) to (xiii), when available for designated international aerodromes or heliports, to form part of the aeronautical information publication, or to be provided separately to recipients of the aeronautical information publication, as follows—

- (i) Aerodrome or Heliport Chart — ICAO;
 - (ii) Aerodrome Ground Movement Chart — ICAO;
 - (iii) Aerodrome Obstacle Chart — ICAO Type A;
 - (iv) Aerodrome Obstacle Chart — ICAO Type B (when available);
 - (v) Aerodrome Terrain and Obstacle Chart — ICAO; (Electronic);
 - (vi) Aircraft Parking or Docking Chart — ICAO;
 - (vii) Area Chart — ICAO;
 - (viii) ATC Surveillance Minimum Altitude Chart — ICAO;
 - (ix) Instrument Approach Chart — ICAO;
 - (x) Precision Approach Terrain Chart — ICAO;
 - (xi) Standard Arrival Chart — Instrument (STAR) — ICAO;
 - (xii) Standard Departure Chart — Instrument (SID) — ICAO; and
 - (xiii) Visual Approach Chart — ICAO;
- (b) provide the Enroute Chart, when available, as part of the AIP, or separately to recipients of the AIP;
- (c) provide the aeronautical charts listed in subparagraphs (i) to (iv), when available, as aeronautical information products, as follows—
- (i) World Aeronautical Chart — ICAO 1:1 000 000;
 - (ii) Aeronautical Chart — ICAO 1:500 000;

- (iii) Aeronautical Navigation Chart — ICAO Small Scale; and
- (d) provide electronic aeronautical charts based on digital databases and the use of geographic information systems; and
- (e) ensure that the chart resolution of aeronautical data is as specified for a particular chart.

28. NOTAM

(1) The aeronautical information service provider shall regularly provide a checklist of valid NOTAM.

(2) Except as otherwise provided in subregulation (5), each NOTAM shall contain the information in the order shown in the NOTAM format in Schedule 3.

(3) NOTAM text shall be composed of the significations or uniform abbreviated phraseology assigned to the ICAO NOTAM Code complemented by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language.

(4) All NOTAM shall be issued in the English language.

(5) Information providing a surface condition report notifying the presence or cessation of hazardous conditions due to standing water or water shall be disseminated by means of a SNOWTAM, and shall contain the information in the order shown in the SNOWTAM format in Schedule 4.

(6) Information concerning an operationally significant change in volcanic activity, volcanic eruption or volcanic ash cloud shall, when reported by means of an ASHTAM, contain the information in the order shown in the ASHTAM format in Schedule 5.

(7) Subject to this regulation, the aeronautical information service provider shall—

- (a) publish NOTAM with sufficient lead time for the affected parties to take any required action, except in the case of unserviceability, volcanic activity, release of radioactive material, toxic chemicals and other events that cannot be foreseen;
- (b) give an estimate of the period of unserviceability or the time at which restoration of service is expected for NOTAM notifying unserviceability of aids to air navigation, facilities or communication services;
- (c) give at least seven days' advance notice of the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions other than for emergency operations;
- (d) give as soon as possible notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace;
- (e) within three months from the issuing of a permanent NOTAM, the information contained in the NOTAM is included in the aeronautical information products affected;
- (f) within three months from the issuing of a temporary NOTAM of long duration, the information contained in the NOTAM is included in the AIP Supplement;
- (g) when a NOTAM with estimated end of validity unexpectedly exceeds the three-month period, issue a replacement NOTAM unless the condition is expected to last for a further period of more than three months, in this case, an AIP Supplement shall be issued;
- (h) when an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures,

originate a Trigger NOTAM giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement;

- (i) ensure the Trigger NOTAM comes into force on the same effective date and time as the AIRAC Amendment or Supplement and the Trigger NOTAM shall remain valid in the pre-flight information bulletin for a period of fourteen days;
- (j) in the case of an AIRAC AIP Supplement that is valid for less than fourteen days, ensure the Trigger NOTAM remains valid for the complete validity period of the AIP Supplement; and
- (k) in the case of an AIRAC AIP Supplement that is valid for fourteen days or more, ensure the Trigger NOTAM remains valid for at least fourteen days.

29. Digital data sets

Where digital data is provided, the aeronautical information service provider shall—

- (a) ensure that digital data is in the form of the following data sets—
 - (i) AIP data set;
 - (ii) terrain data sets;
 - (iii) obstacle data sets;
 - (iv) aerodrome mapping data sets; and
 - (v) instrument flight procedure data sets;
- (b) provide to the next intended user each data set together, with at least the minimum set of metadata that ensures traceability; and
- (c) regularly provide a checklist of valid data sets.

30. AIP data set

Where digital data is in the form of AIP data set, the aeronautical information service provider shall—

- (a) provide an AIP data set covering the extent of information as provided in the AIP;
- (b) provide the available data subsets, when it is not possible to provide a complete AIP data set; and
- (c) ensure that the AIP data set contains the digital representation of aeronautical information of lasting character that is permanent and temporary changes of long duration essential to air navigation.

31. Terrain and obstacle data sets

(1) The coverage areas for terrain and obstacle data sets shall be specified as follows—

- (a) Area 1- the entire territory of Uganda;
- (b) Area 2- within the vicinity of an aerodrome, subdivided as follows—
 - (i) Area 2a- a rectangular area around a runway that comprises the runway strip plus any clearway that exists;
 - (ii) Area 2b- an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;
 - (iii) Area 2c- an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and
 - (iv) Area 2d- an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing Terminal Area boundary, whichever is nearest;

- (c) Area 3- the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway center line and 50 m from the edge of all other parts of the aerodrome movement area; and
- (d) Area 4- the area extending 900 m prior to the runway threshold and 60 m each side of the extended runway center line in the direction of the approach on a precision approach runway, category II or III.

(2) where the terrain at a distance greater than 900 m from the runway threshold is mountainous or otherwise significant, the length of Area 4 is extended to a distance not exceeding 2,000 m from the runway threshold.

32. Terrain data sets

Subject to regulation 31, the aeronautical information service provider shall—

- (a) ensure that terrain data sets contain the digital representation of the terrain surface in the form of continuous elevation values at all intersections or points of a defined grid, referenced to common datum;
- (b) provide terrain data for Area 1;
- (c) for aerodromes regularly used by international civil aviation, provide—
 - (i) terrain data for—
 - (A) Area 2a;
 - (B) the take-off flight path area; and
 - (C) an area bounded by the lateral extent of the aerodrome obstacle limitation surfaces;

- (ii) additional terrain data within Area 2 as follows—
 - (A) in the area extending to 10 kilometers from the ARP; and
 - (B) within the area between 10 kilometers and the TMA boundary or 45 kilometers radius, whichever is smaller, where terrain penetrates a horizontal terrain data collection surface specified as one hundred twenty meters above the lowest runway elevation.
- (iii) terrain data for Area 3;
- (iv) terrain data for Area 4 for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.
- (d) make arrangements for coordinating the provision of terrain data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same terrain are correct;
- (e) make arrangements with states concerned to share terrain data for those aerodromes located near territorial boundaries;
- (f) where additional terrain data is collected to meet other aeronautical requirements, expand the terrain data sets to include this additional data;
- (g) ensure that the feature attributes describing terrain are those listed in Schedule 6 and those annotated as mandatory are recorded in the terrain data set; and
- (h) ensure that terrain data for each area conforms to the applicable numerical requirements contained in Schedule 1.

33. Obstacle data sets

The aeronautical information service provider shall—

- (a) ensure that obstacle data sets contain the digital representation of the vertical and horizontal extent of obstacles;
- (b) ensure that obstacle data is—
 - (i) not included in terrain data sets;
 - (ii) provided for obstacles in Area 1 whose height is 100m or higher above ground.
- (c) for aerodromes regularly used by international civil aviation, provide obstacle data for—
 - (i) all obstacles within Area 2 that are assessed as being a hazard to air navigation;
 - (ii) Area 2a for those obstacles that penetrate an obstacle data collection surface outlined by a rectangular area around a runway that comprises the runway strip plus any clearway that exists and the Area 2a obstacle collection surface shall have height of 3 meter s above the nearest runway elevation measured along the runway center line, and for those portions related to a clearway, if one exists, at the elevation of the nearest runway end;
 - (iii) objects in the take-off flight path area which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area; and
 - (iv) penetrations of the aerodrome obstacle limitation surfaces.
 - (v) Areas 2b, 2c and 2d for obstacles that penetrate the relevant obstacle data collection surface specified as follows—

- (A) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15% to each side. The Area 2b obstacle collection surface has a 1.2% slope extending from the ends of Area 2a at the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15% to each side;
 - (B) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c shall be the elevation of the point of Area 2a at which it commences; and
 - (C) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 kilometers from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground; except that data need not be collected for obstacles less than a height of 3 m above ground in Area 2b and less than a height of 15 m above ground in Area 2c.
- (vi) Area 3 for obstacles that penetrate the relevant obstacle data collection surface extending a half-meter (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.
 - (vii) Area 4 for all runways where precision approach Category II or III operations have been established.

- (d) make arrangements—
 - (i) for coordinating the provision of obstacle data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same obstacle are correct;
 - (ii) with States concerned to share obstacle data for those aerodromes located near territorial boundaries; and
- (e) where additional obstacle data is collected to meet other aeronautical requirements, expand the obstacle data sets to include these additional data.

34. Aerodrome mapping data sets

The aeronautical information service provider shall—

- (a) ensure that aerodrome mapping data sets contain the digital representation of aerodrome features;
- (b) make available aerodrome mapping data sets for aerodromes regularly used by international civil aviation; and
- (c) ensure that aerodrome mapping data is supported by electronic terrain and obstacle data for Area 3 in order to ensure consistency and quality of a geographic data related to the Aerodrome.

35. Instrument flight procedure data sets

The aeronautical information service provider shall—

- (a) ensure that instrument flight procedure data sets contain the digital representation of instrument flight procedures; and
- (b) make available instrument flight procedures data sets for aerodromes regularly used by international civil aviation.

36. Distribution services

The aeronautical information service provider shall—

- (a) distribute aeronautical information products to authorised users who request for them;
- (b) make available the AIP, AIP amendments, AIP supplements and AIC by the most expeditious means; and
- (c) whenever practicable, employ global communication networks and web services, for the provision of aeronautical information products.

37. NOTAM distribution

(1) The aeronautical information service provider shall—

- (a) distribute NOTAM on the basis of a request;
- (b) prepare NOTAM in conformity with the relevant provisions of the Civil Aviation (Communication Procedures) Regulations, 2020;
- (c) whenever practicable, employ the Aeronautical fixed service (AFS) for NOTAM distribution;
- (d) when a NOTAM is sent by means other than the AFS, use a six- digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator, preceding the text;
- (e) select the NOTAM that are to be given international distribution;
- (f) exchange NOTAM Internationally only as mutually agreed with the international NOTAM offices concerned and multinational NOTAM Processing Units, and ensure that as far as practicable, cover the needs of operations personnel including flight crew members;

- (g) upon request grant distribution of NOTAM series other than those distributed internationally; and
- (h) when practicable use selective distribution lists.

(2) The international exchange of ASHTAM and NOTAM, where NOTAM is used for distribution of information on volcanic activity, shall include volcanic ash advisory center and the center designated by regional air navigation agreement for the operation of AFS Secure Aviation Data Information Service (SADIS) and the World Area Forecast System (WAFS) Internet file service (WIFS), and shall take account of the requirements of long-range operations.

(3) A predetermined distribution system for NOTAM transmitted on the AFS in accordance with regulation 39 shall be used whenever possible, subject to the requirements of subregulation (1) (f).

38. Pre-flight information service

- (1) The aeronautical information service provider shall—
 - (a) make available aeronautical information relative to the route stages originating at the aerodrome or heliport to flight operations personnel including flight crews and services responsible for pre-flight information, for any aerodrome or heliport used for international air operations ;
 - (b) ensure that aeronautical information provided for pre-flight planning purposes includes information of operational significance from the elements of the aeronautical information products.
 - (c) use Automated pre-flight information systems to make aeronautical data and aeronautical information available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes and the aeronautical data and aeronautical information made available shall comply with the provisions of these regulations;

- (d) use self-briefing facilities of an automated pre-flight information system to provide access to operations personnel, including flight crew members and other aeronautical personnel concerned and the human or machine interface of such facilities when provided shall ensure easy access in a guided manner to all relevant information or data.

(2) Automated pre-flight information systems for the supply of aeronautical data and aeronautical information for self-briefing, flight planning and flight information service shall—

- (a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical data stored;
- (b) permit access to the system by operations personnel including flight crew members, aeronautical personnel concerned and other aeronautical users through suitable telecommunications means;
- (c) ensure provision, in paper copy form, of the aeronautical data and aeronautical information accessed, as required;
- (d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate, or based on a menu-driven user interface or other appropriate mechanism as agreed between the Uganda Civil Aviation Authority and the concerned operator; and
- (e) provide for rapid response to a user request for information.

(3) Automated pre-flight information systems providing a harmonised, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical data and aeronautical information shall be established by an agreement between Uganda Civil Aviation Authority and the relevant meteorology department.

(4) Where automated pre-flight information systems are used to provide the harmonised common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical data, aeronautical information and meteorological information, the Air Navigation Service Provider shall remain responsible for the quality and timeliness of the aeronautical data and aeronautical information provided by means of such a system.

(5) The aeronautical information referred to in subregulation (3) shall be in accordance with subregulation (1)(c), and the Civil Aviation (Meteorological Services for Air Navigation Services) Regulations, 2022.

39. Post-flight information service

The aeronautical information service provider shall—

- (a) make arrangements to receive information concerning the state and operation of air navigation facilities or services noted by aircrews, for any aerodrome or heliport used for international air operations and ensure that the information is distributed as the circumstances necessitate;
- (b) make arrangements to receive information concerning the presence of wildlife hazard observed by flight crews, for any aerodrome or heliport used for international air operations; and
- (c) distribute information about presence of wildlife hazards made available to the aeronautical information service as the circumstances necessitate.

PART VII— AERONAUTICAL INFORMATION UPDATES

40. General specifications for aeronautical information updates

Aeronautical data and aeronautical information shall be kept up-to-date.

41. Aeronautical Information Regulation and Control (AIRAC)

(1) The aeronautical information service provider shall distribute under the regulated system (AIRAC) information concerning, the following circumstances, basing establishment, withdrawal or significant changes, upon a series of common effective dates at intervals of twenty eight days as follows—

- (a) horizontal and vertical limits, regulations and procedures applicable to—
 - (i) flight information regions;
 - (ii) control areas;
 - (iii) control zones;
 - (iv) advisory areas;
 - (v) ATS routes;
 - (vi) permanent danger, prohibited and restricted areas including type and periods of activity when known and ADIZ;
 - (vii) permanent areas or routes or portions where the possibility of interception exists;
- (b) positions, frequencies, call signs, identifiers, known irregularities and maintenance periods of radio navigation aids, and communication and surveillance facilities;
- (c) holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures;
- (d) transition levels, transition altitudes and minimum sector altitudes;
- (e) meteorological facilities, including broadcasts and procedures;

- (f) runways and stop ways;
- (g) taxiways and aprons;
- (h) aerodrome ground operating procedures including low visibility procedures;
- (i) approach and runway lighting; and
- (j) aerodrome operating minima if published by the Authority.

(2) The information notified under the AIRAC system shall not be changed further for at least another twenty eight days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

(3) Information provided under the AIRAC system shall be made available by the AISP so as to reach recipients at least twenty eight days in advance of the AIRAC effective date.

(4) When information has not been submitted by the AIRAC date, a NIL notification shall be distributed not later than one cycle before the AIRAC effective date concerned.

(5) Implementation dates other than AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work or for updating of navigation databases.

(6) The regulated AIRAC system shall be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the following circumstances—

- (a) position, height and lighting of navigational obstacles;
- (b) hours of service of aerodromes, facilities and services;
- (c) customs, immigration and health services;
- (d) temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft; and

- (e) temporary areas or routes or portions thereof where the possibility of interception exists.

(7) Whenever major changes are planned and where advance notice is desirable and practicable, information shall be made available by the AIS so as to reach recipients at least fifty six days in advance of the effective date and the effective date shall be applied to the establishment of, and premeditated major changes in, the following circumstances and other major changes if deemed necessary—

- (a) new aerodromes for international IFR operations;
- (b) new runways for IFR operations at international aerodromes;
- (c) design and structure of the air traffic services route network;
- (d) design and structure of a set of terminal procedures including change of procedure bearings due to magnetic variation change;
- (e) circumstances listed in subregulation (1) if the entire State or any significant portion is affected or if cross- border coordination is required.

42. Aeronautical Information Publication (AIP) updates

The aeronautical service provider shall —

- (a) amend or reissue the AIP at such regular intervals as may be necessary to keep it up to date;
- (b) publish permanent changes to the AIP as AIP Amendments; and
- (c) publish temporary changes of long duration, three months or longer, and information of short duration which contains extensive text or graphics as AIP supplements.

43. NOTAM updates

(1) A Trigger NOTAM shall be originated when an AIP amendment or an AIP supplement is published in accordance with AIRAC procedures.

(2) A NOTAM shall be originated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration or when operationally significant permanent changes or temporary changes of long duration are made at short notice, except for extensive text or graphics.

(3) A NOTAM shall be originated and issued concerning the following information —

- (a) establishment, closure or significant changes in operation of aerodrome or heliport or runways;
- (b) establishment, withdrawal and significant changes in operation of aeronautical services;
- (c) establishment, withdrawal and significant changes in operational capability of radio navigation and air-ground communication services including interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation or directional aids, change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation and air-ground communication services or limitations of relay stations including operational impact, affected service, frequency and area;
- (d) unavailability of back-up and secondary systems, having a direct operational impact;
- (e) establishment, withdrawal or significant changes made to visual aids;

- (f) interruption of or return to operation of major components of aerodrome lighting systems;
- (g) establishment, withdrawal or significant changes made to procedures for air navigation services;
- (h) occurrence or correction of major defects or impediments in the manoeuvring area;
- (i) changes to and limitations on availability of fuel, oil and oxygen;
- (j) major changes to search and rescue facilities and services available;
- (k) establishment, withdrawal or return to operation of hazard beacons marking obstacles to air navigation;
- (l) changes in regulations requiring immediate action, such as prohibited areas for search and rescue action;
- (m) presence of hazards not otherwise promulgated, which affect air navigation (including obstacles, military exercises and operations, intentional and unintentional radio frequency interferences, rocket launches, displays, fireworks, sky lanterns, rocket debris, races and major parachuting events);
- (n) conflict zones which affect air navigation (to include information that is as specific as possible regarding the nature and extent of threats of that conflict and its consequences for civil aviation);
- (o) planned laser emissions, laser displays and search lights if pilots' night vision is likely to be impaired;
- (p) erecting or removal of, or changes to, obstacles to air navigation in the take-off or climb, missed approach, approach areas and runway strip;
- (q) establishment or discontinuance including activation or deactivation as applicable, or changes in the status of prohibited, restricted or danger areas;

- (r) establishment or discontinuance of areas or routes or portions of the areas or routes where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;
- (s) allocation, cancellation or change of location indicators;
- (t) changes in aerodrome or heliport rescue and firefighting category provided;
- (u) presence or removal of, or significant changes in, hazardous conditions due to radioactive material, toxic chemicals, volcanic ash deposition or water on the movement area;
- (v) outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;
- (w) observations or forecasts of space weather phenomena, the date and time of their occurrence, the flight levels where provided, and portions of the airspace which may be affected by the phenomena;
- (x) an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;
- (y) release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions which could be affected and the direction of movement;
- (z) establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with procedures or limitations which affect air navigation;

- (aa) implementation of short-term contingency measures in cases of disruption or partial disruption, of air traffic services and related supporting services; and
- (bb) specific loss of satellite based navigation systems integrity.

(4) The following information shall not be notified by NOTAM—

- (a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- (b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- (c) temporary obstructions in the vicinity of aerodromes or heliports that do not affect the safe operation of aircraft;
- (d) partial failure of aerodrome or heliport lighting facilities where such failure does not directly affect aircraft operations;
- (e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative;
- (f) the lack of apron marshalling services and road traffic control;
- (g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;
- (h) parachuting when in uncontrolled airspace under VFR, when controlled at promulgated sites or within danger or prohibited areas;
- (i) training activities by ground units;

- (j) unavailability of back-up and secondary systems if these do not have an operational impact;
- (k) limitations to airport facilities or general services with no operational impact;
- (l) national regulations not affecting general aviation;
- (m) announcement or warnings about possible or potential limitations, without any operational impact;
- (n) general reminders on already published information;
- (o) availability of equipment for ground units without containing information on the operational impact for airspace and facility users;
- (p) information about laser emissions without any operational impact and fireworks below minimum flying heights;
- (q) closure of movement area parts in connection with planned work locally coordinated of duration of less than one hour;
- (r) closure, changes, unavailability in operation of aerodrome or heliport other than aerodrome or heliport operation hours; and
- (s) other non-operational information of a similar temporary nature.

44. Data set updates

(1) Data sets shall be amended or reissued at such regular intervals as may be necessary to keep them up to date.

(2) Permanent changes and temporary changes of long duration (three months or longer), shall be issued in the form of a complete data set or a sub-set that includes only the differences from the previously issued complete data set.

(3) The differences from the previously issued complete data set shall be indicated when made available as a completely re-issued data set.

(4) When temporary changes of short duration are made available as digital data that is digital NOTAM), they shall use the same aeronautical information model as the complete data set.

(5) Updates to AIP, digital data sets shall be synchronised.

PART VIII— EXEMPTIONS

45. Requirements for application for exemption

(1) A person may apply to the authority for an exemption from any provision of these Regulations.

(2) Unless in case of emergency, a person who requires an exemption from any provision of these Regulations shall apply to the authority at least sixty days prior to the proposed effective date, giving the following information—

- (a) name and contact address including electronic mail and fax if any;
- (b) telephone number;
- (c) a citation of the specific requirement from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of operations to be conducted under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) an explanation of how the exemption would be in the public interest;
- (h) a detailed description of the alternative means by which the applicant will ensure a level of safety equivalent to that established by the regulation in question;
- (i) a safety risk assessment carried out in respect of the exemption applied for;

- (j) if the applicant handles international operations and seeks to operate under the proposed exemption, an indication whether the exemption would contravene any provision of the standards and recommended practices of the International Civil Aviation Organisation; and
- (k) any other information that the authority may require.

(3) Where the applicant seeks emergency processing of an application for exemption, the application shall contain supporting facts and reasons for not filing the application within the time specified in subregulation (2) and satisfactory reason for deeming the application an emergency.

(4) The authority may in writing, refuse an application made under subregulation (3), where in the opinion of the Authority, the reasons given for emergency processing are not satisfactory.

(5) The application for exemption shall be accompanied by a fee prescribed by the authority.

46. Review and publication

(1) The authority shall review the application for exemption made under regulation 45 for accuracy and compliance and if the application is satisfactory, the authority shall publish a detailed summary of the application for comments, within a prescribed time, in either—

- (a) the Gazette;
- (b) aeronautical information circular; or
- (c) a daily newspaper with national circulation.

(2) The authority shall request the applicant in writing, to comply prior to publication or making a decision where application requirements have not been fully complied with.

47. Evaluation of request

(1) The authority shall, where the application requirements are satisfied, conduct an evaluation of the request to include—

- (a) determination of whether an exemption would be in the public interest;
- (b) a determination, after a technical evaluation of whether the proposal of the applicant would provide a level of safety equivalent to that established by the regulation, although where the authority decides that a technical evaluation of the request would impose a significant burden on the technical resources of the authority, the authority may deny the exemption on that basis;
- (c) a determination of whether a grant of the exemption would contravene these Regulations; or
- (d) a recommendation based on the preceding elements, of whether the request should be granted or denied and of any conditions or limitations that should be part of the exemption.

(2) The authority shall notify the applicant in writing, the decision to grant or deny the request and publish a detailed summary of its evaluation and decision.

(3) The summary referred to in subregulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(4) The authority shall publish the decision after processing the application if the request is for emergency relief.

(5) The authority shall publish the summary in aeronautical information circular if the exemption affects a significant population of the aviation community of the State.

48. Miscellaneous specifications

The aeronautical service provider shall—

- (a) include English text for those parts of the aeronautical information products intended for international distribution expressed in plain language;
- (b) spell the names of places in conformity with local usage, transliterated, when necessary, into the ISO-Basic Latin alphabet;
- (c) use ICAO abbreviations in the aeronautical information products whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information; and
- (d) use units of measurement in the origination, processing and distribution of aeronautical data and aeronautical information consistent with the tables contained in the Civil Aviation (Units of Measurement for air and ground Operations) Regulations, 2020.

49. Use and retention of approvals and records

- (1) A person shall not—
 - (a) use an approval, permission, exemption or any other document issued or required by or under these Regulations which is forged, altered, revoked, suspended or which the person is not entitled to use;
 - (b) forge or alter an approval, permission, exemption or any other document issued or required by or under these Regulations;
 - (c) lend a licence, certificate, approval, permission, exemption or any other document issued or required by or under these Regulations to any other person; or

(d) make any false representation for the purposes of procuring for himself, herself or any other person, issuance, renewal or variation of an approval, permission or exemption or other document.

(2) A person shall not, during the period for which it is required under these Regulations to be preserved—

(a) mutilate, alter, render illegible or destroy an approval or any entry made in any record;

(b) make, procure or assist in the making of any false entry in an approval or record; or

(c) omit to make a material entry in an approval or record.

(3) A record required to be maintained under these Regulations shall be recorded in a permanent and indelible material.

(4) A person shall not purport to issue an approval or exemption for the purposes of these Regulations unless that person is authorised to do so.

(5) The authority may suspend or cancel an approval of AIS service provider who contravenes any provision of these Regulations.

50. Aeronautical information and data that requires regulatory approval

(1) Aeronautical information and data submitted to the AISP may require regulatory approval from the authority before submission can be accepted by the AISP for publication in the AIP.

(2) Aeronautical information and data requiring regulatory approval in subregulation (1) shall be prescribed by the authority and this data shall include—

(a) Controlled or Regulated Airspace;

(b) Ground or Satellite Base Navigation Systems;

- (c) Instrument Flight Procedures;
- (d) VHF or UHF frequencies;
- (e) Danger or Restricted Areas;
- (f) Civil or Military Aerodrome Traffic Zones;
- (g) Aerodrome Runway Declared Distances; and
- (h) Aerodrome Rescue and Fire Fighting categories.

(3) For aeronautical data that requires regulatory approval, data originators shall take into account of the additional time required by the authority for the approvals process.

51. Deviations from regulations and procedures

Any deviation from a prescribed requirement or procedure in these Regulations shall be set out in an endorsement on the MANSOPS.

52. Inspections and audits

The subregulation shall—

- (a) carry out such inspections and audits as may be necessary for the purpose of verifying the application and implementation of these Regulations; and
- (b) carry out inspections and audits of any document and records of aeronautical information service provider, which may be necessary to determine compliance with the appropriate requirements as prescribed in these Regulations.

PART X—REVOCATION, SAVINGS AND TRANSITIONAL

53. Revocation of S.I. No. 34 of 2020

(1) The Civil Aviation (Aeronautical Information Services) Regulations, 2020 are revoked

- (2) A licence, certificate, approval, authorisation or exemption granted under the Regulations revoked in subregulation (1) shall remain in force until its expiry, revocation or replacement as if granted under these Regulations.
- (3) Insert transitional provision

SCHEDULE 1

Regulations 14(i), 15, 32(h)

AERONAUTICAL DATA CATALOGUE
TABLE S1-1 Aerodrome/Heliport Data

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|------------------------|-----------------------|----------------------|-----------|---|-----------|-----------|-------------|------------------|-------------------|
| Aerodrome/ Heliport | Field Elevation | Elevation | Elevation | The vertical distance above Mean Sea Level (MSL) of the highest point of the landing area. | 0.5 m | essential | surveyed | 1 m or 1 ft | 1 m or 1 ft |
| | | G e o i d undulation | Height | Geoid undulation at the aerodrome/ heliport elevation position, where appropriate | 0.5 m | essential | surveyed | 1 m or 1 ft | 1 m or 1 ft |
| | Reference temperature | | Value | The monthly mean of the daily maximum temperatures for the hottest month of the year at an aerodrome. This temperature should be averaged over a period of years. | | | | | |
| | Mean low temperature | | Value | The mean lowest temperature of the coldest month of the year, for the last five years of data at the aerodrome elevation. | 5 degrees | | | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|--------------------|--------------|----------|--|----------|-----------|-------------------------|------------------|-------------------|
| | Magnetic Variation | Angle | Angle | The magnetic variation angle value | 1 degree | essential | surveyed | 1 degree | 1 degree |
| | Reference point | Position | Point | Geographical location of aerodrome reference point. | 30 m | routine | surveyed/ calculated | 1 sec | 1 sec |
| Runway | Nominal length | | Distance | The declared longitudinal extent of the runway for operational (performance) calculations. | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | Nominal width | | Distance | The declared trans-versal extent of the runway for operational (performance) calculations. | 1 m | essential | surveyed | 1 m or 1 ft | 1 m |
| | | | | The geographical location of runway center line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway | 1 m | critical | surveyed | | |
| | | | | The elevation of the corresponding center line point. Any significant high and low intermediate points along the runway shall be measured to the accuracy of one-half meter or foot. | 0.25 m | critical | surveyed | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|------------------|------------------|-----------------------|-----------------------------------|---|-----------|-----------|-------------|------------------|-------------------|
| | | Geoid undulation | Height | The geoid undulation at the corresponding center line point | | | | | |
| | Runway exit line | E x i t guidance line | Line | The geographical location of the runway exit line | 0.5 m | essential | surveyed | 1/100 sec | 1 sec |
| | Shoulder | Width | Distance | The width of the runway shoulder | 1m | essential | surveyed | 1 m or 1 ft | |
| Runway Direction | True bearing | | Bearing | The true bearing of the runway. | 1/100 deg | Routine | surveyed | 1 / 1 0 0 degree | 1 degree |
| | Threshold | Position | Point | Geographical location for runway threshold | 1 m | critical | surveyed | 1/100 sec | 1 sec |
| | | Elevation | Elevation of the runway threshold | Threshold elevation for runways with non-precision approaches | 0.5 m | essential | surveyed | 1 m or 1 ft | 1 m or 1 ft |
| | | Elevation | Elevation of the runway threshold | Threshold elevation for runways with precision approaches | 0.25 m | critical | surveyed | 0.1 m or 0.1 ft | 0.5 m or 1 ft |
| | | G e o i d undulation | Height | WGS-84 geoid undulation at runway threshold, non-precision approaches | 0.5 m | essential | surveyed | 1 m or 1 ft | 1 m or 1 ft |
| | | G e o i d undulation | Height | WGS-84 geoid undulation at runway threshold, precision approaches | 0.25 m | critical | surveyed | 0.1 m or 0.1 ft | 0.5 m or 1 ft |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|-----------------|--------------|-----------|--|----------------|-----------|-------------|------------------|-------------------|
| | | Displacement | Distance | Distance of displaced threshold | 1 m | routine | surveyed | 1 m or 1 ft | |
| | Runway End | Position | Point | Location of the runway end in the direction of departure | 1 m | critical | surveyed | 1/100 sec | 1 sec |
| | | Elevation | Elevation | Elevation of the runway end and any significant high and low intermediate points along the runway for non-precision approaches | 0.5 m or 1 ft | | | | |
| | | Elevation | Elevation | Elevation of the runway end and the highest elevation of the touchdown zone for precision approach runways | 0.25 m or 1 ft | | | | |
| | Touch Down Zone | Elevation | Elevation | Highest elevation of the touchdown zone of a precision approach runway | 0.25 m or 1 ft | | | | |
| | Stop way | Length | Distance | The longitudinal extent of stopway, if any | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | | Width | Distance | Width of the stop way | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | Clearway | Length | Distance | The longitudinal extent of the clearway | 1 m | essential | surveyed | 1 m or 1 ft | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|--------------------|----------------|----------|--|----------|-----------|-------------|------------------|-------------------|
| | | Width | Distance | The transversal extent of the clearway | 1 m | essential | surveyed | 1 m or 1 ft | |
| | | Ground profile | | The vertical profile (or slope) of the clearway | | | | | |
| | Declared Distances | TORA | Distance | Take-off run available - The length of runway declared available and suitable for the ground run of an aeroplane taking off. | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | | TODA | Distance | Take-off distance available - The length of the take-off run available plus the length of the clearway, if provided. | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | | ASDA | Distance | Accelerate-stop distance available - The length of the take-off run available plus the length of the stopway, if provided. | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |
| | | LDA | Distance | Landing distance available - The length of runway which is declared available and suitable for the ground run of an aeroplane landing. | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---|-----------|--------------|-----------|---|----------|-----------|-------------|--|---|
| Final Approach and Take off area (EATO) | Threshold | Position | Point | Geographical location of FATO threshold | 1m | critical | surveyed | 1/100 sec | 1 sec |
| | | Elevation | Elevation | FATO threshold, for heliports with or without a PinS approach | 0.5m | essential | surveyed | 1 m or 1 ft | F A T O threshold, for heliports with or without a PinS approach |
| | | | | FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.25m | critical | surveyed | 1 m or 1 ft (non-precision) or 0.1 m or 0.1 ft (precision) | F A T O threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 |
| | | | Height | WGS-84 geoid undulation at FATO threshold, TLOF geometric center, for heliports with or without a PinS approach | 0.5m | essential | surveyed | 1 m or 1 ft | W G S - 8 4 geoid undulation at FATO threshold, T L O F geometric center, for heliports with or without a PinS approach |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|---------------------------|--------------|-----------|--|-----------|-----------|-------------|--|--|
| | | | | WGS-84 geoid undulation at FATO threshold, TLOF geometric center, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.25m | critical | surveyed | 1 m or 1 ft (non-precision) or 0.1 m or 0.1 ft (precision) | WGS-84 geoid undulation at FATO threshold, TLOF geometric center, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 |
| | Departure end of a runway | Position | Point | Geographical location of DER | 1m | critical | surveyed | 1/100 sec | |
| | | Elevation | Elevation | The elevation of the DER is the higher of the elevations of the beginning and end of the runway/FATO. | | | | | |
| | Length | | Distance | The longitudinal extent of FATO | 1m | critical | surveyed | 1 m or 1 ft | 1 m |
| | True Bearing | | Bearing | The true bearing of FATO | 1/100 deg | routine | surveyed | 1 / 1 0 0 degree | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|-----------------------------|--------------------|--------------|----------|---|----------|-----------|-------------|------------------|-------------------|
| | Declared Distances | TODAH | Distance | Take-off distance available - The length of the FATO plus the length of helicopter clearway (if provided) | 1m | critical | surveyed | 1 m or 1 ft | |
| | | RTODAH | Distance | Rejected Take-off distance available - The length of the FATO declared available and suitable for helicopters operated in performance class 1 to complete a rejected take-off. | 1m | critical | surveyed | 1 m or 1 ft | |
| | | LDAH | Distance | Landing distance available - The length of the FATO plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height. | 1m | critical | surveyed | 1 m or 1 ft | |
| Touchdown and lift-off area | Center point | Position | Point | Geographical location of TLOF geometric center | 1m | critical | surveyed | 1/100 sec | 1 sec |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|----------|--------------|-----------|--|----------|-----------|-------------|--|--|
| | | Elevation | Elevation | FATO threshold, for heliports with or without a PinS approach | 0.5m | essential | surveyed | 1 m or 1 ft | FATO threshold, for heliports with or without a PinS approach |
| | | | | FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.25m | critical | surveyed | 1 m or 1 ft (non-precision) or 0.1 m or 0.1 ft (precision) | FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|----------|------------------|----------|--|----------|-----------|-------------|--|--|
| | | Geoid undulation | Height | WGS-84 geoid undulation at FATO TLOF threshold, geometric center, for heliports with or without a PinS approach | 0.5m | essential | surveyed | 1 m or 1 ft | WGS-84 geoid undulation at FATO threshold, TLOF geometric center, for heliports with or without a PinS approach |
| | | | | WGS-84 geoid undulation at FATO TLOF threshold, geometric center, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.25m | critical | surveyed | 1 m or 1 ft (non-precision) or 0.1 m (precision) | WGS-84 geoid undulation at FATO threshold, TLOF geometric center, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 |
| | Length | | Distance | The longitudinal extent of TLOF | 1m | critical | surveyed | 1 m or 1 ft | 1 m |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------------------------|--|--------------|-----------|---|----------|-----------|----------------------|------------------|-------------------|
| | Width | | Distance | The transversal extent of TLOF | 1m | critical | surveyed | 1 m or 1 ft | 1 m |
| | Bearing strength | | Value | The bearing strength of TLOF | | | | 1 tone | |
| Apron | Geometry | | Polygon | Geographical location of the apron element | 1m | routine | surveyed | 1/10 sec | 1 sec |
| Taxiway | Width | | Distance | The transversal extent of the taxiway. | 1m | essential | surveyed | 1 m or 1 ft | |
| | Center line points | Position | Point | Geographical coordinates of taxiway center line points | 0.5m | essential | surveyed | 1/100 sec | 1/100 sec |
| | | Elevation | Elevation | Elevation of taxiway center line points | 1m | essential | surveyed | | |
| | Shoulder | | Distance | The width of the taxiway shoulder | 1m | essential | surveyed | 1 m or 1 ft | |
| | Guidance Lines | Geometry | Line | Geographical location of guidance lines | 0.5 m | essential | surveyed | 1/100 sec | 1/100 sec |
| | Intermediate holding position marking line | | Line | Intermediate holding position marking line | 0.5 m | essential | surveyed | 1/100 sec | 1 sec |
| | Runway holding position | Geometry | Line | Geographical location of runway holding position | 0.5m | essential | surveyed | 1/100 sec | 1 sec |
| Helicopter ground taxiway | Center line points | | Point | Geographical location of helicopter ground center line taxiway points | 0.5m | essential | surveyed/ calculated | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|------------------------------|---------------------------|--------------|-----------|--|----------|-----------|---------------------|------------------|-------------------|
| | Elevation | | Elevation | Elevation of helicopter ground taxiway | 1m | essential | surveyed | | |
| | Width | | Distance | The transversal extent of the helicopter ground taxiway | 1m | essential | surveyed | | |
| | Surface type | | Text | The surface type of the helicopter ground taxiway | | | | | |
| | Intersection marking line | | Line | Helicopter ground taxiway intersection marking line | 0.5 m | essential | surveyed | 1/100 sec | 1 sec |
| Helicopter air taxiway | Center line points | | Point | Geographical location of helicopter air taxiway center line points | 0.5m | essential | surveyed/calculated | | |
| | Elevation | | Elevation | Elevation of helicopter air taxiway | 1m | essential | surveyed | | |
| | Width | | Distance | The transversal extent of the helicopter air taxiway | 1m | essential | surveyed | | |
| Helicopter air transit route | Width | | Distance | The transversal extent of the helicopter air transit route | 1m | essential | Surveyed | | |
| INS Checkpoint | Position | | Point | Geographical location of the INS check point, where available | 0.5m | routine | surveyed | 1/100 sec | 1/100 sec |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|------------------|-----------------------|--------------|-----------|--|----------|-----------|-------------|------------------|-------------------|
| Aircraft Stand | Aircraft stand points | Position | Point | Geographical location of aircraft stand point | 0.5m | routine | surveyed | 1/100 sec | 1/100 sec |
| | Stand guidance line | Geometry | Line | Geographical location of stand guidance line | 0.5m | essential | surveyed | 1/100 sec | |
| | | Elevation | Elevation | Parking guidance line points elevation | 1m | essential | surveyed | | |
| Helicopter stand | Position | | Point | Geographical location of helicopter stand point/ INS checkpoints | 0.5m | essential | surveyed | 1/100 sec | |
| De-Icing Area | Geometry | | Polygon | Geographical location of de-icing area | 1m | routine | surveyed | 1/10 sec | 1 sec |

TABLE S1-2 Airspace Data

| Subject | Property | Sub property | Type | Description | Note | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------------------------|-----------------|--------------|----------|--|------|----------|-----------|-------------|------------------|-------------------|
| ATS Airspace | Lateral limits | | Polygon | FIR, UIR | | 2 km | routine | declared | 1 min | as plotted |
| | | | | TMA, CTA | | 100 m | essential | calculated | 1 sec | as plotted |
| | | | | CTR | | 100 m | essential | calculated | 1 sec | as plotted |
| | Vertical Limits | Upper limit | Altitude | The upper limit of the airspace | | | | | | |
| | | Lower limit | Altitude | The lower limit of the airspace | | 50 m | routine | calculated | 50 m or 100 ft | 50 m or 100 ft |
| Special activity airspace | Name | | Text | The name given to the airspace by a responsible subregulation | | | | | | |
| | | | | Type of special activity airspace (Prohibited Area, Restricted Area, Danger Area, Military Exercise Area, Military Training Area, Air Defence Identification Zone (ADIZ), Other) | | | | | | |
| | Lateral limits | | Polygon | inside CTA/CTR | | 100 m | essential | calculated | 1 sec | as plotted |
| | | | | outside CTA/CTR | | 2 km | routine | declared | 1 min | as plotted |

TABLE S1-3 ATS and other routes Data

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------------|--------------------------|--------------|------|--|----------|-----------|-------------|------------------|-------------------|
| Route Segment | Navigation specification | | Text | <p>Description of the navigation specifications applicable to a specified segment. There are two kinds of navigation specification—</p> <p>(a) Required navigation performance (RNP) specification, A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH; and</p> <p>(b) Area navigation (RNAV) specification, A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.</p> | | | | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|-------------------------|--------------|----------|--|--|--------------------------------------|---|---------------------------------------|---------------------------------------|
| | Track | | Bearing | Track, VOR radial or magnetic bearing of a route segment | 1/10 degree (terminal arrival departure) | routine (terminal arrival departure) | calculated (terminal arrival departure) | 1 degree (terminal arrival departure) | 1 degree (terminal arrival departure) |
| | Change-over point | | Point | The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft, in case of VOR radial. | | | | | |
| | Length | | Distance | The geodesic distance between from point and to point, for Airway segments length | 1/10 km | routine | calculated | 1/10 km or 1/10 NM | 1 km or 1 NM |
| | MEA | | Altitude | Minimum en-route altitude (MEA). The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance. | 50 m | routine | calculated | 50 m or 100 ft | 50 m or 100 ft |
| | MOCA | | Altitude | Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance. | 50 m | routine | calculated | 50 m or 100 ft | 50 m or 100 ft |
| | Minimum flight altitude | | Altitude | Minimum flight altitude | 50 m | routine | calculated | 50 m or 100 ft | 50 m or 100 ft |
| | Lateral Limits | | Distance | Lateral limits of route | | | | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|-----------------|----------------|--------------|----------|---|-------------|-----------|------------------------|-----------------------|----------------------|
| Waypoint | Identification | | Text | Names, coded designators or name-codes assigned to the significant point. | | | | | |
| | Position | | Point | Geographical location of the waypoint | 100 m | essential | surveyed calculated | 1 sec | 1 sec |
| | Formation | Navaid | Text | The station identification of the reference VOR/DME | | | | | |
| | | Bearing | Bearing | The bearing from the reference VOR/DME, if the waypoint is not collocated with it. | 1/10 degree | routine | calculated | 1/10 degree | 1/10 degree |
| | | Distance | Distance | The distance from the reference VOR/DME, if the waypoint is not collocated with it. | 1/10 km | routine | calculated | 1/10 km or 1/10 NM | 2/10 km (1/10 NM) |
| Enroute holding | Identification | | Text | Identification of the holding procedure | | | | | |
| | Fix | | Text | Identification of the holding procedure fix | | | | | |
| | Waypoint | | Point | Geographical location of the holding waypoint | 100m | essential | surveyed calculated | 1 sec | 1 sec |

TABLE S1-4 Instrument flight procedure data

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|-------------------|---------------------------|--------------|-----------------|--|--------------------------|-----------|-------------|----------------------|--------------------------|
| Procedure | OCA/H | Altitude | Altitude | The lowest altitude used in establishing compliance with appropriate obstacle clearance criteria. | as specified in Doc 8168 | essential | | | as specified in Doc 8168 |
| | | Height | Height | The lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria. | as specified in Doc 8168 | essential | | | as specified in Doc 8168 |
| Procedure segment | Procedure altitude/height | | Altitude/Height | A specified altitude/height flown operationally at or above the minimum altitude/height and established to accommodate a stabilised descent data prescribed descent gradient/angle in the intermediate/final approach segment. | as specified in Doc 8168 | essential | | | as specified in Doc 8168 |
| | MOCA | | Altitude | The minimum altitude for a defined segment that provides the required obstacle clearance. | | | | | |
| | Distance | | Distance | Geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between each successive designated significant point; | 1/100 km | essential | calculated | 1/100 km or 1/100 NM | 1 km or 1 NM |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|------------------------|------------------|--------------------|-----------|--|--------------|-----------|-------------|--------------------|-------------------|
| | True bearing | | Bearing | True track to the nearest tenth of a degree to the nearest degree between each successive significant point; | 1/10 degree | routine | calculated | 1/10 degree | 1 degree |
| | Magnetic bearing | | Bearing | Magnetic track to the nearest tenth of a degree to the nearest degree between each successive significant point; | 1/10 degree | routine | calculated | 1 degree | 1 degree |
| Final approach segment | LTP/FTP | Position | Point | Latitude and Longitude of the LTP/FTP | 0.3 m (1 ft) | critical | | 0.0005" (0.01") | |
| | | Ellipsoid height | Elevation | The height of the LTP/FTP above the WGS-84 ellipsoid | 0.25 m | critical | | 0.1 m | |
| | | Orthometric height | Elevation | The height of the LTP/FTP as related to the geoid and presented as an MSL elevation | | | | | |
| | FPAP | | | Flight path alignment point (FPAP) | | | | | |
| | | Position | Point | Latitude and Longitude of the FPAP | 0.3 m (1 ft) | critical | | 0.0005" (0.01") | |
| | | Orthometric height | Elevation | The height of the FPAP as related to the geoid and presented as an MSL elevation | | | | | |
| | TCH | | Height | Approach Threshold Crossing Height (TCH) - The designated crossing height of the flight path angle above the LTP (or FTP). | 0.5 m | critical | calculated | 0.05 m | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|---------------------------|--------------|----------|---|----------|-----------|-------------|------------------|-------------------|
| | GPA | | Value | Glide Path Angle (GPA) - The angle of the approach path (glide path) with respect to the horizontal plane defined according to WGS-84 at the LTP/FTP. | 0.01° | N/A | | 0.01° | |
| | Course Width at threshold | | Value | The semi-width of the lateral course width at the LTP/FTP, defining the lateral offset at which the receiver will achieve full-scale deflection. | N/A | critical | | 0.25 m | |
| | Delta Length Offset | | Distance | The distance from the stop end of the runway to the FPAP .It defines the location where lateral sensitivity changes to the missed approach sensitivity. | N/A | N/A | | 8 m | |
| | HAL | | Value | Horizontal Alert Limit | | | | | |
| | VAL | | Value | Vertical Alert Limit | | | | | |
| | FAS Data Block | | Text | Binary string describing the Final Approach Segment (FAS) data block generated with an appropriate software tool. The FAS data block is a set of parameters to identify a single precision approach or APV and define its associated approach | | | | | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|-------------------|-----------------|--------------|----------|--|------------------|------------|-----------------------|----------------------|--|
| | CRC Remainder | | Text | An 8-character hexadecimal representation of the calculated remainder bits used to determine the integrity of the FAS data block data during transmission and storage. | | | | | |
| Procedure fix | Position | | Point | Geographical location of the fix | 100 m | essential | surveyed / calculated | 1 sec | 1 sec |
| | | | | | 3 m | essential | surveyed / calculated | 1/10 sec | 1 sec |
| | Formations | Navaid | Text | The station identification of the reference VOR/DME | | | | | |
| | | Bearing | Bearing | Bearing used for the formation of a terminal fix | routine | calculated | 1/10 degree | 1/10 degree | Bearing used for the formation of a terminal fix |
| | | | | Bearing used for the formation of an instrument approach procedure fix | essential | calculated | 1/100 degree | 1/10 degree | Bearing used for the formation of an instrument approach procedure fix |
| | | Distance | Distance | The distance from the reference VOR/DME, if the waypoint is not collocated with it. | 1/100 km | essential | calculated | 1/100 km or 1/100 NM | 2/10 km (1/10 NM) |
| Procedure Holding | Fix | | Point | Geographical location that serves as a reference for a holding procedure. | same as proc fix | | | | Fix |
| | Inbound course | | Angle | Inbound true course | | | | 1/10 degree | |
| | Outbound course | | Angle | Outbound true course | | | | 1/10 degree | |

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|--------------------------------|------------------|--------------|----------|--|----------|-----------|-------------|-----------------------------|-------------------|
| | Leg distance | | Distance | Outbound distance of the leg | | | | 1/10 km or 1/10 NM | |
| | Turn direction | | Value | Direction of the procedure turn | | | | | |
| | Minimum altitude | | Altitude | Minimum holding level to the nearest higher 50 m or 100 feet/flight level | 50 m | routine | calculated | 50 m or 100 ft/flight level | |
| | Maximum altitude | | Altitude | Maximum holding level to the nearest higher 50 m or 100 feet /flight level | | | | 50 m or 100 ft/flight level | |
| | Speed | | Value | Maximum indicated air speed | | | | 10 kts | |
| Helicopter Procedure Specifics | HCH | | Height | Helipport crossing height | 0.5 m | essential | calculated | 1 m or 1 ft | 1 m or 1 ft |
| | IDF | | Point | Initial departure fix | | | | | |
| | MAPt | | Point | Missed Approach Point | | | | | |

TABLE S1-5 Radio navigation aids/systems data

| Subject | Property | Sub property | Type | Description | Note | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|----------------------|----------|--------------|------|---|------|----------|-----------|-------------|------------------|-------------------|
| Radio navigation aid | Name | | Text | The textual name assigned to the navaid | | | | | | |

| Subject | Property | Sub property | Type | Description | Note | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|---------------------|--------------|-----------|---|------------------|-------------|-----------|-------------|------------------------|-------------------|
| | Purpose | | Code list | Indication whether navigation aid serves en-route (E), aerodrome (A) or dual (AE) purposes. | | | | | | |
| | Magnetic Variation | Angle | Angle | The magnetic variation at the radio navigation aid | ILS Localizer | 1 degree | essential | surveyed | 1 degree | |
| | | | | | NDB | 1 degree | routine | surveyed | 1 degree | |
| | | Date | Date | The date on which the magnetic variation had the corresponding value. | | | | | | |
| | Position | | Point | Geographical location of the radio navigation aid | Aerodrome Navaid | 3 m | essential | surveyed | 1/10 sec | as plotted |
| | | | | | GBAS Ref Point | 1 m | | | | |
| | | | | | Enroute | 100 m | essential | surveyed | 1 sec | |
| | Elevation | | Elevation | The elevation of the transmitting antenna of DME The elevation of GBAS reference point | DME | 30m (100ft) | essential | surveyed | 30 m (100 ft) | 30 m (100 ft) |
| | | | | | DME/P | 3 m | essential | surveyed | 3 m (10 ft) | |
| | | | | | GBAS Ref Point | 0.25 m | essential | | 1 m or 1 ft | |
| | Ellipsoidal height | | Height | The ellipsoid height of the GBAS reference point. | GBAS | | | | | |
| | Localizer alignment | Bearing | Bearing | The localizer course | ILS Localizer | 1/100 deg | essential | surveyed | 1/100 degree (if true) | 1 degree |

| Subject | Property | Sub property | Type | Description | Note | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|---------|--------------------------------------|--------------|----------|---|---------------|-----------|-----------|-------------|------------------------|-------------------|
| | | Type | Text | Type of localizer alignment, true or magnetic | ILS Localizer | | | | | |
| | Zero azimuth alignment | | Bearing | MLS zero azimuth alignment | MLS | 1/100 deg | essential | surveyed | 1/100 degree (if true) | 1 degree |
| | Angle | | Angle | The angle of the glide path of an ILS or the normal glide path angle for the MLS installation | ILS GP / MLS | | | | | |
| | RDH | | Value | The value of the ILS Reference Datum Height (ILS RDH). | ILS GP | 0.5m | critical | calculated | 0.1m or 0.1ft | 0.5m or 1ft |
| | Localizer antenna rwy end distance | | Distance | ILS localizer runway/FATO end distance | ILS Localizer | 3 m | routine | calculated | 1 m or 1 ft | as plotted |
| | ILS glideslope antenna TRSH distance | | Distance | ILS glideslope antenna - threshold distance along centerline | ILS GP | 3 m | routine | calculated | 1 m or 1 ft | as plotted |
| | ILS marker TRSH distance | | Distance | ILS marker - threshold distance | ILS | 3 m | essential | calculated | 1 m or 1 ft | 2/10 km (1/10 NM) |
| | ILS DME antenna TRSH distance | | Distance | ILS DME antenna - threshold distance along centerline | ILS | 3 m | essential | calculated | 1 m or 1 ft | as plotted |
| | MLS azimuth antenna rwy end distance | | Distance | MLS azimuth antenna - runway/FATO end distance | MLS | 3 m | routine | calculated | 1 m or 1 ft | as plotted |
| | MLS DME antenna TRSH distance | | Distance | MLS DME/P antenna - threshold distance along center line | MLS | 3 m | essential | calculated | 1 m or 1 ft | as plotted |

| Subject | Property | Sub property | Type | Description | Note | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|----------------------------|---------------------|--------------|-----------|---|------|----------|-----------|-----------------------|------------------|-------------------|
| | Signal polarisation | | Code list | GBAS signal polarisation (GBAS/H or GBAS/E) | GBAS | | | | | |
| | DOC | | Text | Designated operational coverage (DOC or standard service volume SSV) as range or service volume radius from the navaid / GBAS reference point, height and sectors if required | | | | | | |
| Aeronautical ground lights | Intensity | | Value | Intensity of the light of the beacon | | | | | 1000 candela | |
| Special navigation system | Position | | Point | Geographical location of the special navigation system | | 100m | essential | surveyed / calculated | | |

Table S1-6 Obstacle Data

| Subject | Property | Sub property | Type | Description | Accuracy | Integrity | Origin Type | Pub. Resolution. | Chart Resolution. |
|----------|---------------------|--------------|-----------|---|----------|-----------|-------------|------------------|-------------------|
| Obstacle | Obstacle identifier | | Text | Unique identifier of obstacle | | | | | |
| | Operator / Owner | | Text | Name and Contact information of obstacle operator or owner | | | | | |
| | Geometry type | | Code list | An indication whether the obstacle is a point, line or polygon. | | | | | |

| | | | | | | | | | |
|--|---------------------|--|--------------------------|--|-------|-----------|----------|---------------------------|-------------|
| | | | Point Line Polygon | Obstacles in Area 1 | 50 m | routine | surveyed | 1 sec | as plotted |
| | | | | Obstacles in Area 2 (including 2a, 2b, 2c, 2d, take-off flight path area and obstacle limitation surfaces) | 5 m | essential | surveyed | 1/10 sec | 1/10 sec |
| | | | | Obstacles in Area 3 | 0.5 m | essential | surveyed | 1/10 sec | 1/10 sec |
| | | | | Obstacles in Area 4 | 2.5 m | essential | surveyed | | |
| | Horizontal extent | | Distance | Horizontal extent of the obstacle | | | | | |
| | Elevation | | Elevation | Obstacles in Area 1 | 30 m | routine | surveyed | 1 m or 1 ft | 3 m (10 ft) |
| | Height | | Height | Obstacles in Area 2 (including 2a, 2b, 2c, 2d, take-off flight path area and obstacle limitation surfaces) | 3 m | essential | surveyed | 1 m or 1 ft | 1 m or 1 ft |
| | | | | Obstacles in Area 3 | 0.5 m | essential | surveyed | 0.1 m or 0.1 ft 0.01 m | 1m or 1 ft |
| | | | | Obstacles in Area 4 | 1 m | essential | surveyed | 0.1 m | |
| | Type | | Text | Type of obstacle | | | | | |
| | Date and time stamp | | Date | Date and time the obstacle was created | | | | | |
| | Operations | | Text | Feature operations of mobile obstacles | | | | | |
| | Effectivity | | Text | Effectivity of temporary types of obstacles | | | | | |

Table S1-7. Terrain Data Numerical Requirements

| | Area 1 | Area 2 | Area 3 | Area 4 |
|--------------------------|-------------------------------------|------------------------------------|---------------------------------------|--------------------------------------|
| Post spacing | 3 arc seconds (approx. 90 m) | 1 arc second (approx. 30 m) | 0.6 arc seconds (approx. 20 m) | 0.3 arc seconds (approx. 9 m) |
| Vertical accuracy | 30 m | 3 m | 0.5 m | 1 m |
| Vertical resolution | 1 m | 0.1 m | 0.01 m | 0.1 m |
| Horizontal accuracy | 50 m | 5 m | 0.5 m | 2.5 m |
| Confidence level | 90% | 90% | 90% | 90% |
| Integrity classification | routine | essential | essential | essential |
| Maintenance period | as required | as required | as required | as required |

Table S1-8 Data Types

| Type (1) | Description (2) | Data elements (3) |
|-----------------|---|------------------------------|
| Point | A pair of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of the point on the surface of the Earth. | Latitude |
| | | Longitude |
| | | Horizontal reference system |
| | | Units of measurement |
| | | Horizontal accuracy achieved |
| Line | Sequence of Points defining a linear object | Sequence of Points |
| Polygon | Sequence of Points forming the boundary of the polygon. The first and last Point are identical. | Closed sequence of Points |
| Height | The vertical distance of a level, point or an object considered as a point, measured from a specific datum. | Numerical value |
| | | Vertical reference system |
| | | Units of measurement |
| | | Vertical accuracy achieved |

| Type (1) | Description (2) | Data elements (3) |
|-----------------|---|--|
| Altitude | The vertical distance of a level, a point or an object considered as a point, measured from mean sea level. | Numerical value |
| | | Vertical reference system |
| | | Units of measurement |
| | | Vertical accuracy achieved |
| Elevation | The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level. | Numerical value |
| | | Vertical reference system |
| | | Units of measurement |
| | | Vertical accuracy |
| Distance | A linear value | Numerical value |
| | | Units of measurement |
| | | Accuracy achieved |
| Angle / Bearing | An angular value | Numerical value |
| | | Units of measurement |
| | | Accuracy achieved |
| Value | Any measured, declared or derived value not listed above. | Numerical Value |
| | | Units of Measurement |
| | | Accuracy achieved |
| Date | A calendar date referencing a particular day or month | Text |
| Schedule | A repetitive time period, composed of one or more intervals or special dates (e.g. holidays) occurring cyclically | Text |
| Code list | A set of predefined Text strings or values | Text |
| Text | Free text | String of characters without constraints |

SCHEDULE 2

Regulation 24(e)

Contents of the Aeronautical Information Publication (AIP)

Note 1. — The information elements prefixed with “#AIP-DS#” may be omitted when available through the AIP data set

Note 2.— The information elements prefixed with “#OBS-DS#” may be omitted when available through the obstacle data set

PART 1 — GENERAL (GEN)

When the AIP is produced as one volume, the preface, record of AIP Amendments, record of AIP supplements, checklist of AIP pages and list of current hand amendments appear only in Part 1 — GEN, and the annotation “not applicable” shall be entered against each of these subsections in Parts 2 and 3.

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP supplements, checklist of AIP pages and list of current hand amendments shall be included in each volume.

GEN 0.1 Preface

Brief description of the AIP, including—

- (a) name of the publishing subregulation ;
- (b) applicable ICAO documents;
- (c) publication media, that is, printed, online or other electronic media;
- (d) AIP structure and established regular amendment interval;
- (e) copyright policy, if applicable; and
- (f) service to contact in case of detected AIP errors or omissions.

GEN 0.2 Record of AIP Amendments

A record of AIP Amendments and AIRAC AIP Amendments published in accordance with the AIRAC system containing-

- (a) amendment number;
- (b) publication date;

- (c) date inserted for the AIRAC AIP Amendments, effective date; and
- (d) initials of officer who inserted the amendment.

GEN 0.3 Record of AIP supplements

A record of issued AIP supplements containing -

- (a) Supplement number;
- (b) Supplement subject;
- (c) AIP section affected;
- (d) period of validity; and
- (e) cancellation record.

GEN 0.4 Checklist of AIP pages

A checklist of AIP pages containing -

- (a) page number or chart title; and
- (b) publication or effective date, including, day, month by name and year of the aeronautical information.

GEN 0.5 List of hand amendments to the AIP

A list of current hand amendments to the AIP containing -

- (a) AIP page affected;
- (b) amendment text; and
- (c) AIP Amendment number by which a hand amendment was introduced.

GEN 0.6 Table of contents to Part 1

A list of sections and subsections contained in Part 1 — General (GEN).

GEN 1. NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 Designated authorities

The addresses of designated authorities concerned with the facilitation of international air navigation (civil aviation, meteorology, customs, immigration, health, en-route and aerodrome/heliport charges, agricultural quarantine and aircraft accident investigation) containing, for each subregulation —

- (a) designated subregulation ;
- (b) name of the subregulation ;
- (c) postal address;
- (d) telephone number;
- (e) telefax number;

- (f) e-mail address;
- (g) aeronautical fixed service (AFS) address; and
- (h) website address, if available.

GEN 1.2 Entry, transit and departure of aircraft

Regulations and requirements for advance notification and applications for permission concerning entry, transit and departure of aircraft on international flights.

GEN 1.3 Entry, transit and departure of passengers and crew

Regulations (including customs, immigration and quarantine, and requirements for advance notification and applications for permission) concerning entry, transit and departure of non-immigrant passengers and crew.

GEN 1.4 Entry, transit and departure of cargo

Regulations (including customs, and requirements for advance notification and applications for permission) concerning entry, transit and departure of cargo.

GEN 1.5 Aircraft instruments, equipment and flight documents

Brief description of aircraft instruments, equipment and flight documents, including—

- (a) instruments, equipment (including aircraft communication, navigation and surveillance equipment) and flight documents to be carried on aircraft, including any special requirement in addition to the provisions specified in Annex 6, Part I, Chapters 6 and 7; and
- (b) emergency locator transmitter (ELT), signalling devices and life-saving equipment as presented in Annex 6, Part I, 6.6 and Part II, 2.4.5, where so determined by regional air navigation agreement, for flights over designated land areas.

GEN 1.7 Differences from ICAO Standards, Recommended Practices and Procedures

- (1) A list of significant differences between national regulations and practices of the State and related ICAO provisions, including—
 - (a) provision affected (Annex and edition number, paragraph); and
 - (b) difference in full text.

- (2) All significant differences shall be listed under this subsection.
- (3) All Annexes shall be listed in numerical order even if there is no difference to an Annex, in which case a NIL notification shall be provided. National differences or the degree of non-application of the regional supplementary procedures (SUPPs) shall be notified immediately following the Annex to which the supplementary procedure relates.

GEN 2. TABLES AND CODES

GEN 2.1 Measuring system, aircraft markings, holidays

GEN 2.1.1 Units of measurement

Description of units of measurement used including table of units of measurement.

GEN 2.1.2 Temporal reference system

Description of the temporal reference system such as calendar and time system employed, together with an indication of whether or not daylight saving hours are employed and how the temporal reference system is presented throughout the AIP.

GEN 2.1.3 Horizontal reference system

Brief description of the horizontal (geodetic) reference system used, including—

- (a) name or designation of the reference system;
- (b) identification and parameters of the projection;
- (c) identification of the ellipsoid used;
- (d) identification of the datum used;
- (e) area of application; and
- (f) an explanation, if applicable, of the asterisk used to identify those coordinates that do not meet the accuracy requirements.

GEN 2.1.4 Vertical reference system

Brief description of the vertical reference system used, including -

- (a) name or designation of the reference system;
- (b) description of the geoid model used including the parameters required for height transformation between the model used and EGM-96; and

- (c) an explanation, if applicable, of the asterisk used to identify those elevations/geoid undulations that do not meet the accuracy requirements.

GEN 2.1.5 Aircraft nationality and registration marks

Indication of aircraft nationality and registration marks adopted by the State.

GEN 2.1.6 Public holidays

A list of public holidays with indication of services being affected.

GEN 2.2 Abbreviations used in aeronautical information products

A list of alphabetically arranged abbreviations and their respective significations used by the State in its AIP and in the distribution of aeronautical data and aeronautical information with appropriate annotation for those national abbreviations that are different from those contained in the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400).

GEN 2.3 Chart symbols

A list of chart symbols arranged according to the chart series where symbols are applied.

GEN 2.4 Location indicators

A list of alphabetically arranged location indicators assigned to the locations of aeronautical fixed stations to be used for encoding and decoding purposes. An annotation to locations not connected to the aeronautical fixed service (AFS) shall be provided.

GEN 2.5 List of radio navigation aids

#AIP-DS#A list of radio navigation aids arranged alphabetically, containing—

- (a) identifier;
- (b) name of the station;
- (c) type of facility or aid; and
- (d) indication whether aid serves en-route (E), aerodrome (A) or dual (AE) purposes.

GEN 2.6 Conversion of units of measurement

Tables for conversion or, alternatively, conversion formulae between—

- (a) nautical miles and kilometers and vice versa;

- (b) feet and meters and vice versa;
- (c) decimal minutes of arc and seconds of arc and vice versa; and
- (d) other conversions as appropriate.

GEN 2.7 Sunrise or sunset

Information on the time of sunrise and sunset including a brief description of criteria used for determination of the times given and either a simple formulae or table from which times may be calculated for any location within its territory/area of responsibility, or an alphabetical list of locations for which the times are given in a table with a reference to the related page in the table and the sunrise/sunset tables for the selected stations/locations, including—

- (a) station name;
- (b) ICAO location indicator;
- (c) geographical coordinates in degrees and minutes;
- (d) date(s) for which times are given;
- (e) time for the beginning of morning civil twilight;
- (f) time for sunrise;
- (g) time for sunset; and
- (h) time for the end of evening civil twilight.

GEN 3. SERVICES

GEN 3.1 Aeronautical information services

GEN 3.1.1 Responsible service

Description of the aeronautical information service (AIS) provided and its major components, including-

- (a) service or unit name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available;
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (i) an indication if service is not H24.

GEN 3.1.2 Area of responsibility

The area of responsibility for the AIS.

GEN 3.1.3 Aeronautical publications

Description of the elements of the aeronautical information products, including—

- (a) AIP and related amendment service;
- (b) AIP supplements;
- (c) AIC;
- (d) NOTAM and pre-flight information bulletins (PIB);
- (e) checklists and lists of valid NOTAM; and
- (f) how they may be obtained.

When an AIC is used to promulgate publication prices, that shall be indicated in this section of the AIP.

GEN 3.1.4 AIRAC system

Brief description of the AIRAC system provided including a table of present and near future AIRAC dates.

GEN 3.1.5 Pre-flight information service at aerodromes or heliports

A list of aerodromes or heliports at which pre-flight information is routinely available, including an indication of relevant—

- (a) elements of the aeronautical information products held;
- (b) maps and charts held; and
- (c) general area of coverage of such information.

GEN 3.1.6 Digital data sets

Description of the available data sets, including—

- (a) data set title;
- (b) short description;
- (c) data subjects included;
- (d) geographical scope; and
- (e) if applicable, limitations related to its usage.
- (f) Contact details of how data sets may be obtained, containing:
 - (i) name of the individual, service or organisation responsible;
 - (ii) street address and e-mail address of the individual, service or organisation responsible;
 - (iii) telefax number of the individual, service or organisation responsible;

- (iv) contact telephone number of the individual, service or organisation responsible;
- (v) hours of service, for instance, time period including time zone when contact can be made;
- (vi) online information that can be used to contact the individual, service or organisation; and
- (vii) supplemental information, if necessary, on how and when to contact the individual, service or organisation.

GEN 3.2 Aeronautical charts

GEN 3.2.1 Responsible service

Description of service responsible for the production of aeronautical charts, including—

- (a) service name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available;
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (i) an indication if service is not H24.

GEN 3.2.2 Maintenance of charts

Brief description of how aeronautical charts are revised and amended.

GEN 3.2.3 Purchase arrangements

Details of how charts may be obtained, containing—

- (a) service or sales agency;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address; and
- (g) website address, if available.

GEN 3.2.4 Aeronautical chart series available

A list of aeronautical chart series available followed by a general description of each series and an indication of the intended use.

GEN 3.2.5 List of aeronautical charts available

A list of aeronautical charts available, including—

- (a) title of series;
- (b) scale of series;
- (c) name or number of each chart or each sheet in a series;
- (d) price per sheet; and
- (e) date of latest revision.

GEN 3.2.6 Index to the World Aeronautical Chart (WAC) — ICAO 1:1 000 000

- (1) An index chart showing coverage and sheet layout for the WAC 1:1 000 000 produced by a State.
- (2) If Aeronautical Chart — ICAO 1:500 000 is produced instead of WAC 1:1 000 000, index charts shall be used to indicate coverage and sheet layout for the Aeronautical Chart — ICAO 1:500 000.

GEN 3.2.7 Topographical charts

Details of how topographical charts may be obtained, containing—

- (a) name of service or agency;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address; and
- (g) website address, if available.

GEN 3.2.8 Corrections to charts not contained in the AIP

A list of corrections to aeronautical charts not contained in the AIP, or an indication where such information can be obtained.

GEN 3.3 Air traffic services

GEN 3.3.1 Responsible service

Description of the air traffic service (ATS) and its major components, including:

- (a) service name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available;
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (i) an indication if service is not H24.

GEN 3.3.2 Area of responsibility

Brief description of area of responsibility for which ATS is provided.

GEN 3.3.3 Types of services

Brief description of main types of ATS provided.

GEN 3.3.4 Coordination between the operator and ATS

General conditions under which coordination between the operator and air traffic services is effected.

GEN 3.3.5 Minimum flight altitude

The criteria used to determine minimum flight altitudes.

GEN 3.3.6 ATS units address list

A list of ATS units and their addresses arranged alphabetically, containing-

- (a) unit name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address; and
- (g) website address, if available.

GEN 3.4 Communication and navigation services

GEN 3.4.1 Responsible service

Description of the service responsible for the provision of telecommunication and navigation facilities, including-

- (a) service name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available;
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (i) an indication if service is not H24.

GEN 3.4.2 Area of responsibility

Brief description of area of responsibility for which telecommunication service is provided.

GEN 3.4.3 Types of service

Brief description of the main types of service and facilities provided, including-

- (a) radio navigation services;
- (b) voice or data link services;
- (c) broadcasting service;
- (d) language used; and
- (e) an indication of where detailed information can be obtained.

GEN 3.4.4 Requirements and conditions

Brief description concerning the requirements and conditions under which the communication service is available.

GEN 3.4.5 Miscellaneous

Any additional information, for instance, selected radio broadcasting stations, telecommunications diagram.

GEN 3.5 Meteorological services

GEN 3.5.1 Responsible service

Brief description of the meteorological service responsible for the provision of meteorological information, including-

- (a) service name;
- (b) postal address;

- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available;
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (i) an indication if service is not H24.

GEN 3.5.2 Area of responsibility

Brief description of area or air routes for which meteorological service is provided.

GEN 3.5.3 Meteorological observations and reports

Detailed description of the meteorological observations and reports provided for international air navigation, including—

- (a) name of the station and the ICAO location indicator;
- (b) type and frequency of observation including an indication of automatic observing equipment;
- (c) types of meteorological reports such as METAR and availability of a trend forecast;
- (d) specific type of observation system and number of observation sites used to observe and report surface wind, visibility, runway visual range, cloud base, temperature and, where applicable, wind shear, for instance, anemometer at intersection of runways, transmissometer next to touchdown zone;
- (e) hours of operation; and
- (f) indication of aeronautical climatological information available.

GEN 3.5.4 Types of services

Brief description of the main types of service provided, including details of briefing, consultation, display of meteorological information, flight documentation available for operators and flight crew members, and of the methods and means used for supplying the meteorological information.

GEN 3.5.5 Notification required from operators

Minimum amount of advance notice required by the meteorological subregulation from operators in respect of briefing, consultation and flight documentation and other meteorological information they require or change.

GEN 3.5.6 Aircraft reports

As necessary, requirements of the meteorological subregulation for the making and transmission of aircraft reports.

GEN 3.5.7 VOLMET service

Description of VOLMET or D-VOLMET service, including—

- (a) name of transmitting station;
- (b) call sign or identification and abbreviation for the radio communication emission;
- (c) frequency or frequencies used for broadcast;
- (d) broadcasting period;
- (e) hours of service;
- (f) list of aerodromes/heliports for which reports and/or forecasts are included; and
- (g) reports, forecasts and SIGMET information included and remarks.

GEN 3.5.8 SIGMET and AIRMET service

Description of the meteorological watch provided within flight information regions or control areas for which air traffic services are provided, including a list of the meteorological watch offices with—

- (a) name of the meteorological watch office and the ICAO location indicator;
- (b) hours of service;
- (c) flight information region or control area served;
- (d) SIGMET validity periods;
- (e) specific procedures applied to SIGMET information, for instance, for volcanic ash and tropical cyclones;
- (f) procedures applied to AIRMET information in accordance with relevant regional air navigation agreements;
- (g) ATS unit provided with SIGMET and AIRMET information; and
- (h) additional information, for instance, concerning any limitation of service.

GEN 3.5.9 Other automated meteorological services

Description of available automated services for the provision of meteorological information, for instance, automated pre-flight information service accessible by telephone and/or computer modem, including—

- (a) service name;
- (b) information available;
- (c) areas, routes and aerodromes covered; and
- (d) telephone and telefax number, e-mail address, and, if available, website address.

GEN 3.6 Search and rescue

GEN 3.6.1 Responsible service

Brief description of service responsible for the provision of search and rescue (SAR), including-

- (a) service or unit name;
- (b) postal address;
- (c) telephone number;
- (d) telefax number;
- (e) e-mail address;
- (f) AFS address;
- (g) website address, if available; and
- (h) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

GEN 3.6.2 Area of responsibility

Brief description of area of responsibility within which SAR services are provided.

GEN 3.6.3 Types of service

Brief description and geographical portrayal, where appropriate, of the type of service and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft.

GEN 3.6.4 SAR agreements

Brief description of SAR agreements in force, including provisions for facilitating entry and departure of other States' aircraft for search, rescue, salvage, repair or salvage in connection with lost or damaged aircraft, either with airborne notification only or after flight plan notification.

GEN 3.6.5 Conditions of availability

Brief description of provisions for SAR, including the general conditions under which the service and facilities are available for international use, including an indication of whether a facility available for SAR is specialised in SAR techniques and functions, or is specially used for other purposes but adapted for SAR purposes by training and equipment, or is only occasionally available and has no particular training or preparation for SAR work.

GEN 3.6.6 Procedures and signals used

Brief description of the procedures and signals employed by rescue aircraft and a table showing the signals to be used by survivors.

GEN 4 - CHARGES FOR AERODROMES OR HELIPORTS AND AIR NAVIGATION SERVICES

GEN 4.1 Aerodrome or heliport charges

Brief description of type of charges which may be applicable at aerodromes or heliports available for international use, including—

- (a) landing of aircraft;
- (b) parking, hangarage and long-term storage of aircraft;
- (c) passenger service;
- (d) security;
- (e) noise-related items;
- (f) other, for instance, customs, health, immigration;
- (g) exemptions or reductions; and
- (h) methods of payment.

GEN 4.2 Air navigation services charges

Brief description of charges which may be applicable to air navigation services provided for international use, including—

- (a) approach control;
- (b) route air navigation services;
- (c) cost basis for air navigation services and exemptions or reductions; and
- (d) methods of payment.

PART 2 — EN-ROUTE (ENR)

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface,

record of AIP Amendments, record of AIP supplements, checklist of AIP pages and list of current hand amendments shall be included in each volume. In the case of an AIP being published as one volume, the annotation “not applicable” shall be entered against each of the above subsections.

ENR 0.1 Table of contents to Part 2

A list of sections and subsections contained in Part 2 — En-route.

ENR 1. GENERAL RULES AND PROCEDURES

ENR 1.1 General rules

The requirement is for publication of the general rules as applied within the State.

ENR 1.2 Visual flight rules

The requirement is for publication of the visual flight rules as applied within the State.

ENR 1.3 Instrument flight rules

The requirement is for publication of the instrument flight rules as applied within the State.

ENR 1.4 ATS airspace classification and description

ENR 1.4.1 ATS airspace classification

Description of ATS airspace classes in the form of the ATS airspace classification table in Annex 11, Appendix 4, appropriately annotated to indicate those airspace classes not used by the State.

ENR 1.4.2 ATS airspace description

Other ATS airspace descriptions as applicable, including general textual descriptions.

ENR 1.5 Holding, approach and departure procedures

ENR 1.5.1 General

The requirement is for a statement concerning the criteria on which holding, approach and departure procedures are established. If different from ICAO provisions, the requirement is for presentation of criteria used in a tabular form.

ENR 1.5.2 Arriving flights

The requirement is to present procedures, for instance, conventional or area navigation, or both for arriving flights which are common to flights into or within the same type of airspace. If different procedures apply within a terminal airspace, a note to this effect shall be given together with a reference to where the specific procedures can be found.

ENR 1.5.3 Departing flights

The requirement is to present procedures, for instance, conventional or area navigation, or both for departing flights which are common to flights departing from any aerodrome or heliport.

ENR 1.5.4 Other relevant information and procedures

Brief description of additional information, for instance, entry procedures, final approach alignment, holding procedures and patterns.

ENR 1.6 ATIS surveillance services and procedures

ENR 1.6.1 Primary radar

Description of primary radar services and procedures, including:

- (a) supplementary services;
- (b) the application of radar control service;
- (c) radar and air-ground communication failure procedures;
- (d) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of radar coverage.

ENR 1.6.2 Secondary surveillance radar

Description of secondary surveillance radar (SSR) operating procedures, including:

- (a) emergency procedures;
- (b) air-ground communication failure and unlawful interference procedures;
- (c) the system of SSR code assignment;
- (d) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of SSR coverage.

ENR 1.6.3 Automatic dependent surveillance — broadcast

Description of automatic dependent surveillance — broadcast (ADS-B) operating procedures, including-

- (a) emergency procedures;

- (b) air-ground communication failure and unlawful interference procedures;
- (c) aircraft identification requirements;
- (d) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of ADS-B coverage.

ENR 1.6.4 Other relevant information and procedures

Brief description of additional information and procedures, for instance, radar failure procedures and transponder failure procedures.

ENR 1.7 Altimeter setting procedures

The requirement is for a statement of altimeter setting procedures in use, containing:

- (a) brief introduction with a statement concerning the ICAO documents on which the procedures are based together with differences to ICAO provisions, if any;
- (b) basic altimeter setting procedures;
- (c) description of altimeter setting region;
- (d) procedures applicable to operators including pilots; and
- (e) table of cruising levels.

ENR 1.8 Regional supplementary procedures

The requirement is for presentation of regional supplementary procedures (SUPPs) affecting the entire area of responsibility.

ENR 1.9 Air traffic flow management and airspace management

Brief description of air traffic flow management (ATFM) system and airspace management, including—

- (a) ATFM structure, service area, service provided, location of unit(s) and hours of operation;
- (b) types of flow messages and descriptions of the formats; and
- (c) procedures applicable for departing flights, containing:
 - (i) service responsible for provision of information on applied ATFM measures;
 - (ii) flight plan requirements; and
 - (iii) slot allocations;
- (d) information on overall responsibility regarding airspace management within FIR(s), details of civil or military airspace allocation and management coordination, structure of manageable airspace (allocation and changes to allocation) and general operating procedures.

ENR 1.10 Flight planning

The requirement is to indicate any restriction, limitation or advisory information related to the flight planning stage which may assist the user in the presentation of the intended flight operation, including—

- (a) procedures for the submission of a flight plan;
- (b) repetitive flight plan system; and
- (c) changes to the submitted flight plan.

ENR 1.11 Addressing of flight plan messages

The requirement is for an indication, in tabular form, of the addresses allocated to flight plans, showing—

- (a) category of flight (IFR, VFR or both);
- (b) route (into or via FIR or TMA); and
- (c) message address.

ENR 1.12 Interception of civil aircraft

The requirement is for a complete statement of interception procedures and visual signals to be used with a clear indication of whether ICAO provisions are applied and, if not, that differences exist.

ENR 1.13 Unlawful interference

The requirement is for presentation of appropriate procedures to be applied in case of unlawful interference.

ENR 1.14 Air traffic incidents

Description of air traffic incidents reporting system, including-

- (a) definition of air traffic incidents;
- (b) use of the “Air Traffic Incident Reporting Form”;
- (c) reporting procedures (including in-flight procedures); and
- (d) purpose of reporting and handling of the form.

ENR 2. ATS AIRSPACE

ENR 2.1 FIR, UIR, TMA and CTA

#AIP-DS# Detailed description of flight information regions (FIR), upper flight information regions (UIR), and control areas (CTA) (including specific CTA such as TMA), including-

- (a) name, geographical coordinates in degrees and minutes of the FIR/UIR lateral limits and in degrees, minutes and seconds of the CTA lateral limits, vertical limits and class of airspace;

- (b) identification of unit providing the service;
- (c) call sign of aeronautical station serving the unit and language(s) used, specifying the area and conditions, when and where to be used, if applicable;
- (d) frequencies, and if applicable SATVOICE number, supplemented by indications for specific purposes; and
- (e) remarks.

#AIP-DS# Control zones around military air bases not otherwise described in the AIP shall be included in this subsection. Where the requirements of Annex 2 concerning flight plans, two-way communications and position reporting apply to all flights in order to eliminate or reduce the need for interceptions and/or where the possibility of interception exists and the maintenance of guard on the VHF emergency channel 121.5 MHz is required, a statement to this effect shall be included for the relevant area(s) or portion(s) thereof. A description of designated areas over which the carriage of an emergency locator transmitter (ELT) is required and where aircraft shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

ENR 2.2 Other regulated airspace

Where established, a detailed description of other types of regulated airspace and airspace classification.

ENR 3. ATS ROUTES

ENR 3.1 Lower ATS routes

#AIP-DS# Detailed description of lower ATS routes, including—

- (a) route designator, designation of the required communication performance (RCP) specification, navigation specification or required surveillance performance (RSP) specification applicable to a specified segment, names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- (b) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between each

- successive designated significant point and, in the case of VOR radials, changeover points;
- (c) upper and lower limits or minimum en-route altitudes, to the nearest higher 50 m or 100 ft, and airspace classification;
 - (d) lateral limits and minimum obstacle clearance altitudes;
 - (e) direction of cruising levels;
 - (f) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
 - (g) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

ENR 3.2 Upper ATS routes

#AIP-DS# Detailed description of upper ATS routes, including—

- (a) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- (b) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- (c) upper and lower limits and airspace classification;
- (d) lateral limits;
- (e) direction of cruising levels;
- (f) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- (g) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification limitations.

ENR 3.3 Area navigation routes

#AIP-DS# Detailed description of PBN (RNAV and RNP) routes, including—

- (a) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to

- a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- (b) in respect of waypoints defining an area navigation route, additionally as applicable:
 - (i) station identification of the reference VOR/DME;
 - (ii) bearing to the nearest degree and the distance to the nearest tenth of a kilometer or tenth of a nautical mile from the reference VOR/DME, if the waypoint is not collocated with it; and
 - (iii) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft);
 - (c) magnetic bearing to the nearest degree, geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between defined end-points and distance between each successive designated significant point;
 - (d) upper and lower limits and airspace classification;
 - (e) direction of cruising levels;
 - (f) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
 - (g) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

ENR 3.4 Helicopter routes

#AIP-DS# Detailed description of helicopter routes, including:

- (1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- (2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between each

successive designated significant point and, in the case of VOR radials, change over points;

- (3) upper and lower limits and airspace classification;
- (4) minimum flight altitudes to the nearest higher 50 m or 100 ft;
- (5) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- (6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

ENR 3.5 Other routes

#AIP-DS# The requirement is to describe other specifically designated routes which are compulsory within specified 1area(s).

ENR 3.6 En-route holding

#AIP-DS# The requirement is for a detailed description of en-route holding procedures, containing—

- (a) holding identification, if any, and holding fix (navigation aid) or waypoint with geographical coordinates in degrees, minutes and seconds;
- (b) inbound track;
- (c) direction of the procedure turn;
- (d) maximum indicated airspeed;
- (e) minimum and maximum holding level;
- (f) time or distance outbound; and
- (g) indication of the controlling unit and its operating frequency.

ENR 4. RADIO NAVIGATION AIDS OR SYSTEMS

ENR 4.1 Radio navigation aids — en-route

- (1) *#AIP-DS#* A list of stations providing radio navigation services established for en-route purposes and arranged alphabetically by name of the station, including—
 - (a) name of the station and magnetic variation to the nearest degree and for VOR, station declination to the nearest degree used for technical line-up of the aid;
 - (b) identification;

- (c) frequency or channel for each element;
- (d) hours of operation;
- (e) geographical coordinates in degrees, minutes and seconds of the position of the transmitting antenna;
- (f) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft); and
- (g) remarks.

(2) If the operating subregulation of the facility is other than the designated governmental agency, the name of the operating subregulation shall be indicated in the remarks column. Facility coverage shall be indicated in the remarks column.

ENR 4.2 Special navigation systems

(1) #AIP-DS# Description of stations associated with special navigation systems, for instance, DECCA, LORAN, including—

- (a) name of station or chain;
- (b) type of service available (master signal, slave signal, colour);
- (c) frequency (channel number, basic pulse rate, recurrence rate, as applicable);
- (d) hours of operation;
- (e) geographical coordinates in degrees, minutes and seconds of the position of the transmitting station; and
- (f) remarks.

(2) If the operating subregulation of the facility is other than the designated governmental agency, the name of the operating subregulation shall be indicated in the remarks column. Facility coverage shall be indicated in the remarks column.

ENR 4.3 Global navigation satellite system (GNSS)

(1) A list and description of elements of the global navigation satellite system (GNSS) providing the navigation service established for en-route purposes and arranged alphabetically by name of the element, including—

- (a) the name of the GNSS element, (GPS, GLONASS, EGNOS, MSAS, WAAS, etc.);
- (b) frequency(ies), as appropriate;

- (c) geographical coordinates in degrees, minutes and seconds of the nominal service area and coverage area; and
 - (d) remarks.
- (2) If the operating subregulation of the facility is other than the designated governmental agency, the name of the operating subregulation shall be indicated in the remarks column.

ENR 4.4 Name-code designators for significant points

#AIP-DS# A list of alphabetically arranged name-code designators (five-letter pronounceable “name-code”) established for significant points at positions not marked by the site of radio navigation aids, including—

- (a) name-code designator;
- (b) geographical coordinates in degrees, minutes and seconds of the position;
- (c) reference to ATS or other routes where the point is located; and
- (d) remarks, including supplementary definition of positions where required.

ENR 4.5 Aeronautical ground lights — en-route

#AIP-DS# A list of aeronautical ground lights and other light beacons designating geographical positions which are selected by the State as being significant, including—

- (a) name of the city or town or other identification of the beacon;
- (b) type of beacon and intensity of the light in thousands of candelas;
- (c) characteristics of the signal;
- (d) operational hours; and
- (e) remarks.

ENR 5. NAVIGATION WARNINGS

ENR 5.1 Prohibited, restricted and danger areas

- (1) *#AIP-DS#* Description, supplemented by graphic portrayal where appropriate, of prohibited, restricted and danger areas together with information regarding their establishment and activation, including—
- (a) identification, name and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;
 - (b) upper and lower limits; and
 - (c) remarks, including time of activity.

- (2) Type of restriction or nature of hazard and risk of interception in the event of penetration shall be indicated in the remarks column.

ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ)

#AIP-DS# Description, supplemented by graphic portrayal where appropriate, of established military training areas and military exercises taking place at regular intervals, and established air defence identification zone (ADIZ), including—

- (a) geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;
- (b) upper and lower limits and system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures; and
- (c) remarks, including time of activity and risk of interception in the event of penetration of ADIZ.

ENR 5.3 Other activities of a dangerous nature and other potential hazards

ENR 5.3.1 Other activities of a dangerous nature

#AIP-DS# Description, supplemented by charts where appropriate, of activities that constitute a specific or obvious danger to aircraft operation and could affect flights, including—

- (a) geographical coordinates in degrees and minutes of center of area and range of influence;
- (b) vertical limits;
- (c) advisory measures;
- (d) subregulation responsible for the provision of information; and
- (e) remarks, including time of activity.

ENR 5.3.2 Other potential hazards

#AIP-DS# Description, supplemented by charts where appropriate, of other potential hazards that could affect flights active volcanoes, nuclear power stations, including—

- (a) geographical coordinates in degrees and minutes of location of potential hazard;
- (b) vertical limits;
- (c) advisory measures;

- (d) subregulation responsible for the provision of information; and
- (e) remarks.

ENR 5.4 Air navigation obstacles

#*OBS-DS*# A list of obstacles affecting air navigation in Area 1 (the entire State territory), including—

- (a) obstacle identification or designation;
- (b) type of obstacle;
- (c) obstacle position, represented by geographical coordinates in degrees, minutes and seconds;
- (d) obstacle elevation and height to the nearest meter or foot; and
- (e) type and colour of obstacle lighting, if any.

ENR 5.5 Aerial sporting and recreational activities

#*AIP-DS*# Brief description, supplemented by graphic portrayal where appropriate, of intensive aerial sporting and recreational activities together with conditions under which they are carried out, including—

- (a) designation and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;
- (b) vertical limits;
- (c) operator or user telephone number; and
- (d) remarks, including time of activity.

ENR 5.6 Bird migration and areas with sensitive fauna

Description, supplemented by charts where practicable, of movements of birds associated with migration, including migration routes and permanent resting areas and areas with sensitive fauna.

ENR 6. EN-ROUTE CHARTS

The requirement is for the En-route Chart — ICAO and index charts to be included in this section.

PART 3 — AERODROMES (AD)

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP supplements, checklist of AIP pages and list of current hand amendments shall be included in each volume.

In the case of an AIP being published as one volume, the annotation “not applicable” shall be entered against each of the above subsections.

AD 0.1 Table of contents to Part 3

A list of sections and subsections contained in Part 3 — Aerodromes (AD).

AD 1. AERODROMES/HELIPORTS — INTRODUCTION

AD 1.1 Aerodrome/heliport availability and conditions of use

AD 1.1.1 General conditions

Brief description of the State’s designated subregulation responsible for aerodromes and heliports, including—

- (a) the general conditions under which aerodromes/heliports and associated facilities are available for use; and
- (b) a statement concerning the ICAO documents on which the services are based and a reference to the AIP location where differences, if any, are listed.

AD 1.1.2 Use of military air bases

Regulations and procedures, if any, concerning civil use of military air bases.

AD 1.1.3 Low visibility procedures

The general conditions under which the low visibility procedures applicable to Cat II/III operations at aerodromes, if any, are applied.

AD 1.1.4 Aerodrome operating minima

Details of aerodrome operating minima applied by the State.

AD 1.1.5 Other information

If applicable, other information of a similar nature

AD 1.2 Rescue and firefighting services and snow plan

AD 1.2.1 Rescue and firefighting services

Brief description of rules governing the establishment of rescue and firefighting services at aerodromes and heliports available for public use together with an indication of rescue and firefighting categories established by a State.

AD 1.2.2 Snow plan

Brief description of general snow plan considerations for aerodromes/heliports available for public use at which snow conditions are normally liable to occur, including:

- (a) organisation of the winter service;
- (b) surveillance of movement areas;
- (c) measuring methods and measurements taken;
- (d) actions taken to maintain the usability of movement areas;
- (e) system and means of reporting;
- (f) the cases of runway closure; and
- (g) distribution of information about snow conditions.

AD 1.3 Index to aerodromes and heliports

A list, supplemented by graphic portrayal, of aerodromes and heliports within a State, including—

- (a) aerodrome or heliport name and ICAO location indicator;
- (b) type of traffic permitted to use the aerodrome or heliport (international/national, IFR/VFR, scheduled or non-scheduled, general aviation, military and other); and
- (c) reference to AIP, Part 3 subsection in which aerodrome or heliport details are presented.

AD 1.4 Grouping of aerodromes/heliports

Brief description of the criteria applied by the State in grouping aerodromes or heliports for production/distribution/provision of information purposes (international/national; primary/secondary; major/other; civil/military; etc.).

AD 1.5 Status of certification of aerodromes

A list of aerodromes in the State, indicating the status of certification, including:

- (1) aerodrome name and ICAO location indicator;
- (2) date and, if applicable, validity of certification; and
- (3) remarks, if any.

AD 2. AERODROMES

Note.—**** is to be replaced by the relevant ICAO location indicator.

****** AD 2.1 Aerodrome location indicator and name**

The requirement is for the ICAO location indicator allocated to the aerodrome and the name of aerodrome. An ICAO location indicator shall be an integral part of the referencing system applicable to all subsections in section AD 2.

****** AD 2.2 Aerodrome geographical and administrative data**

The requirement is for aerodrome geographical and administrative data, including—

- (a) aerodrome reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- (b) direction and distance of aerodrome reference point from center of the city or town which the aerodrome serves;
- (c) aerodrome elevation to the nearest meter or foot, reference temperature and mean low temperature;
- (d) where appropriate, geoid undulation at the aerodrome elevation position to the nearest meter or foot;
- (e) magnetic variation to the nearest degree, date of information and annual change;
- (f) name of aerodrome operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- (g) types of traffic permitted to use the aerodrome (IFR/VFR); and
- (h) remarks.

****** AD 2.3 Operational hours**

Detailed description of the hours of operation of services at the aerodrome, including—

- (a) aerodrome operator;
- (b) customs and immigration;
- (c) health and sanitation;
- (d) AIS briefing office;
- (e) ATS reporting office (ARO);
- (f) MET briefing office;
- (g) air traffic service;
- (h) fuelling;
- (i) handling;
- (j) security;
- (k) de-icing; and
- (l) remarks.

****** AD 2.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the aerodrome, including—

- (a) cargo-handling facilities;
- (b) fuel and oil types;

- (c) fuelling facilities and capacity;
- (d) de-icing facilities;
- (e) hangar space for visiting aircraft;
- (f) repair facilities for visiting aircraft; and
- (g) remarks.

****** AD 2.5 Passenger facilities**

Passenger facilities available at the aerodrome, provided as a brief description or a reference to other information sources such as a website, including-

- (a) hotel at or in the vicinity of aerodrome;
- (b) restaurant at or in the vicinity of aerodrome;
- (c) transportation possibilities;
- (d) medical facilities;
- (e) bank and post office at or in the vicinity of aerodrome;
- (f) tourist office; and
- (g) remarks.

****** AD 2.6 Rescue and firefighting services**

Detailed description of the rescue and firefighting services and equipment available at the aerodrome, including-

- (a) aerodrome category for firefighting;
- (b) rescue equipment;
- (c) capability for removal of disabled aircraft; and
- (d) remarks.

****** AD 2.7 Seasonal availability — clearing**

Detailed description of the equipment and operational priorities established for the clearance of aerodrome movement areas, including-

- (a) type of clearing equipment;
- (b) clearance priorities; and
- (c) remarks.

****** AD 2.8 Aprons, taxiways and check locations or positions data**

- (1) Details related to the physical characteristics of aprons, taxiways and locations or positions of designated checkpoints, including-
 - (a) designation, surface and strength of aprons;
 - (b) designation, width, surface and strength of taxiways;
 - (c) location and elevation to the nearest meter or foot of altimeter checkpoints;

- (d) location of VOR checkpoints;
 - (e) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
 - (f) remarks.
- (2) If check locations or positions are presented on an aerodrome chart, a note to that effect shall be provided under this subsection.

****** AD 2.9 Surface movement guidance and control system and markings**

Brief description of the surface movement guidance and control system and runway and taxiway markings, including—

- (a) use of aircraft stand identification signs, taxiway guide lines and visual docking or parking guidance system at aircraft stands;
- (b) runway and taxiway markings and lights;
- (c) stop bars and runway guard lights, if any;
- (d) other runway protection measures; and
- (e) remarks.

****** AD 2.10 Aerodrome obstacles**

#OBS-DS# Detailed description of obstacles, including—

- (a) obstacles in Area 2—
 - (i) obstacle identification or designation;
 - (ii) type of obstacle;
 - (iii) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - (iv) obstacle elevation and height to the nearest meter or foot;
 - (v) obstacle marking, and type and colour of obstacle lighting, if any; and
 - (vi) NIL indication, if appropriate;
- (b) the absence of an Area 2 data set for the aerodrome is to be clearly stated and obstacle data are to be provided for—
 - (i) obstacles that penetrate the obstacle limitation surfaces;
 - (ii) obstacles that penetrate the take-off flight path area obstacle identification surface; and
 - (iii) other obstacles assessed as being hazardous to air navigation;

- (c) indication that information on obstacles in Area 3 is not provided, or if provided—
 - (i) obstacle identification or designation;
 - (ii) type of obstacle;
 - (iii) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - (iv) obstacle elevation and height to the nearest tenth of a meter or tenth of a foot;
 - (v) obstacle marking, and type and colour of obstacle lighting, if any;
 - (vi) if appropriate, an indication that the list of obstacles is available as a digital data set, and a reference to GEN 3.1.6; and
 - (vii) NIL indication, if appropriate.

****** AD 2.11 Meteorological information provided**

Detailed description of meteorological information provided at the aerodrome and an indication of which meteorological office is responsible for the service enumerated, including:

- (a) name of the associated meteorological office;
- (b) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- (c) office responsible for preparation of TAFs and periods of validity and interval of issuance of the forecasts;
- (d) availability of the trend forecasts for the aerodrome, and interval of issuance;
- (e) information on how briefing and/or consultation is provided;
- (f) types of flight documentation supplied and language used in flight documentation;
- (g) charts and other information displayed or available for briefing or consultation;
- (h) supplementary equipment available for providing information on meteorological conditions, for instance, weather radar and receiver for satellite images;
- (i) the air traffic services unit provided with meteorological information; and
- (j) additional information, for instance concerning any limitation of service.

****** AD 2.12 Runway physical characteristics**

Detailed description of runway physical characteristics, for each runway, including—

- (a) designations;
- (b) true bearings to one-hundredth of a degree;
- (c) dimensions of runways to the nearest meter or foot;
- (d) strength of pavement (PCN and associated data) and surface of each runway and associated stopways;
- (e) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end and, where appropriate, geoid undulation of—
 - (i) thresholds of a non-precision approach runway to the nearest meter or foot; and
 - (ii) thresholds of a precision approach runway to the nearest tenth of a meter or tenth of a foot;
- (f) elevations of:
 - (i) thresholds of a non-precision approach runway to the nearest meter or foot; and
 - (ii) thresholds and the highest elevation of the touchdown zone of a precision approach runway to the nearest tenth of a meter or tenth of a foot;
- (g) slope of each runway and associated stopways;
- (h) dimensions of stopway (if any) to the nearest meter or foot;
- (i) dimensions of clearway (if any) to the nearest meter or foot;
- (j) dimensions of strips;
- (k) dimensions of runway end safety areas;
- (l) location (which runway end) and description of arresting system if any;
- (m) the existence of an obstacle-free zone; and
- (n) remarks.

****** AD 2.13 Declared distances**

- (1) Detailed description of declared distances to the nearest meter or foot for each direction of each runway, including—
 - (a) runway designator;
 - (b) take-off run available;
 - (c) take-off distance available, and if applicable, alternative reduced declared distances;
 - (d) accelerate-stop distance available;

- (e) landing distance available; and
 - (f) remarks, including runway entry or start point where alternative reduced declared distances have been declared.
- (2) If a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this shall be declared and the words “not usable” or the abbreviation “NU” entered (Annex 14, Volume I, Attachment A, Section 3).

****** AD 2.14 Approach and runway lighting**

Detailed description of approach and runway lighting, including-

- (a) runway designator;
- (b) type, length and intensity of approach lighting system;
- (c) runway threshold lights, colour and wing bars;
- (d) type of visual approach slope indicator system;
- (e) length of runway touchdown zone lights;
- (f) length, spacing, colour and intensity of runway center line lights;
- (g) length, spacing, colour and intensity of runway edge lights;
- (h) colour of runway end lights and wing bars;
- (i) length and colour of stopway lights; and
- (j) remarks.

****** AD 2.15 Other lighting and secondary power supply**

Description of other lighting and secondary power supply, including-

- (a) location, characteristics and hours of operation of aerodrome beacon or identification beacon, if any;
- (b) location and lighting, if any of anemometer or landing direction indicator;
- (c) taxiway edge and taxiway center line lights;
- (d) secondary power supply including switch-over time; and
- (e) remarks.

****** AD 2.16 Helicopter landing area**

Detailed description of helicopter landing area provided at the aerodrome, including—

- (a) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric center of touchdown and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area—

- (i) for non-precision approaches, to the nearest meter or foot; and
- (ii) for precision approaches, to the nearest tenth of a meter or tenth of a foot;
- (b) TLOF or FATO area elevation—
 - (i) for non-precision approaches, to the nearest meter or foot; and
 - (ii) for precision approaches, to the nearest tenth of a meter or tenth of a foot;
- (c) TLOF and FATO area dimensions to the nearest meter or foot, surface type, bearing strength and marking;
- (d) true bearings to one-hundredth of a degree of FATO;
- (e) declared distances available, to the nearest meter or foot;
- (f) approach and FATO lighting; and
- (g) remarks.

****** AD 2.17 Air traffic services airspace**

#AIP-DS# Detailed description of air traffic services (ATS) airspace organised at the aerodrome, including:

- (1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- (2) vertical limits;
- (3) airspace classification;
- (4) call sign and language(s) of the ATS unit providing service;
- (5) transition altitude;
- (6) hours of applicability; and
- (7) remarks.

****** AD 2.18 Air traffic services communication facilities**

Detailed description of ATS communication facilities established at the aerodrome, including:

- (1) service designation;
- (2) call sign;
- (3) channel(s);
- (4) SATVOICE number(s), if available;
- (5) logon address, as appropriate;
- (6) hours of operation; and
- (7) remarks.

****** AD 2.19 Radio navigation and landing aids**

- (1) *#AIP-DS#* Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the aerodrome, including-
- (a) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS, and GBAS, and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;
 - (b) identification, if required;
 - (c) frequency(ies), channel number(s), service provider and reference path identifier(s) (RPI), as appropriate;
 - (d) hours of operation, as appropriate;
 - (e) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
 - (f) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft); elevation of GBAS reference point to the nearest meter or foot, and the ellipsoid height of the point to the nearest meter or foot. For SBAS, the ellipsoid height of the landing threshold point (LTP) or the fictitious threshold point (FTP) to the nearest meter or foot;
 - (g) service volume radius from the GBAS reference point to the nearest kilometer or nautical mile; and
 - (h) remarks.
- (2) When the same aid is used for both en-route and aerodrome purposes, a description shall also be given in section ENR 4. If the GBAS serves more than one aerodrome, description of the aid shall be provided under each aerodrome. If the operating subregulation of the facility is other than the designated governmental agency, the name of the operating subregulation shall be indicated in the remarks column. Facility coverage shall be indicated in the remarks column.

****** AD 2.20 Local aerodrome regulations**

Detailed description of regulations applicable to the use of the aerodrome, including the acceptability of training flights, non-radio and microlight

aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

****** AD 2.21 Noise abatement procedures**

Detailed description of noise abatement procedures established at the aerodrome.

****** AD 2.22 Flight procedures**

Detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organisation at the aerodrome. When established, detailed description of the low visibility procedures at the aerodrome, including—

- (a) runway(s) and associated equipment authorised for use under low visibility procedures;
- (b) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- (c) description of ground marking or lighting for use under low visibility procedures; and
- (d) remarks.

****** AD 2.23 Additional information**

Additional information at the aerodrome, such as an indication of bird concentrations at the aerodrome, together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 2.24 Charts related to an aerodrome**

- (1) The requirement is for charts related to an aerodrome to be included in the following order:
 - (a) Aerodrome or Heliport Chart — ICAO;
 - (b) Aircraft Parking or Docking Chart — ICAO;
 - (c) Aerodrome Ground Movement Chart — ICAO;
 - (d) Aerodrome Obstacle Chart — ICAO Type A (for each runway);
 - (e) Aerodrome Obstacle Chart — ICAO Type B (when available);
 - (f) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
 - (g) Precision Approach Terrain Chart — ICAO (precision approach Cat II and III runways);
 - (h) Area Chart — ICAO (departure and transit routes);
 - (i) Standard Departure Chart — Instrument — ICAO;

- (j) Area Chart — ICAO (arrival and transit routes);
 - (k) Standard Arrival Chart — Instrument — ICAO;
 - (l) ATC Surveillance Minimum Altitude Chart — ICAO;
 - (m) Instrument Approach Chart — ICAO (for each runway and procedure type);
 - (n) Visual Approach Chart — ICAO; and
 - (o) bird concentrations in the vicinity of the aerodrome.
- (2) If some of the charts are not produced, a statement to this effect shall be given in section GEN 3.2.

AD 3. HELIPORTS

When a helicopter landing area is provided at the aerodrome, associated data shall be listed only under **** AD 2.16.

****** AD 3.1 Helipport location indicator and name**

The requirement is for the ICAO location indicator assigned to the heliport and the name of heliport. An ICAO location indicator shall be an integral part of the referencing system applicable to all subsections in section AD 3.

****** AD 3.2 Helipport geographical and administrative data**

The requirement is for heliport geographical and administrative data, including—

- (a) heliport reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- (b) direction and distance of heliport reference point from center of the city or town which the heliport serves;
- (c) heliport elevation to the nearest meter or foot, reference temperature and mean low temperature;
- (d) where appropriate, geoid undulation at the heliport elevation position to the nearest meter or foot;
- (e) magnetic variation to the nearest degree, date of information and annual change;
- (f) name of heliport operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- (g) types of traffic permitted to use the heliport (IFR/VFR); and
- (h) remarks.

****** AD 3.3 Operational hours**

Detailed description of the hours of operation of services at the heliport, including—

- (a) heliport operator;
- (b) customs and immigration;
- (c) health and sanitation;
- (d) AIS briefing office;
- (e) ATS reporting office (ARO);
- (f) MET briefing office;
- (g) air traffic service;
- (h) fuelling;
- (i) handling;
- (j) security;
- (k) de-icing; and
- (l) remarks.

****** AD 3.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the heliport, including—

- (a) cargo-handling facilities;
- (b) fuel and oil types;
- (c) fuelling facilities and capacity;
- (d) de-icing facilities;
- (e) hangar space for visiting helicopters;
- (f) repair facilities for visiting helicopters; and
- (g) remarks.

****** AD 3.5 Passenger facilities**

Passenger facilities available at the heliport, provided as a brief description or as a reference to other information sources such as a website, including—

- (a) hotels at or in the vicinity of the heliport;
- (b) restaurants at or in the vicinity of the heliport;
- (c) transportation possibilities;
- (d) medical facilities;
- (e) bank and post office at or in the vicinity of the heliport;
- (f) tourist office; and
- (g) remarks.

****** AD 3.6 Rescue and firefighting services**

Detailed description of the rescue and firefighting services and equipment available at the heliport, including:

- (a) heliport category for firefighting;
- (b) rescue equipment;
- (c) capability for removal of disabled helicopters; and
- (d) remarks.

****** AD 3.7 Seasonal availability - clearing**

Detailed description of the equipment and operational priorities established for the clearance of heliport movement areas, including—

- (a) type(s) of clearing equipment;
- (b) clearance priorities; and
- (c) remarks.

****** AD 3.8 Aprons, taxiways and check locations or positions data**

(1) Details related to the physical characteristics of aprons, taxiways and locations or positions of designated checkpoints, including—

- (a) designation, surface and strength of aprons, helicopter stands;
- (b) designation, width and surface type of helicopter ground taxiways;
- (c) width and designation of helicopter air taxiway and air transit route;
- (d) location and elevation to the nearest meter or foot of altimeter checkpoints;
- (e) location of VOR checkpoints;
- (f) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- (g) remarks.

(2) If check locations or positions are presented on a heliport chart, a note to that effect shall be provided under this paragraph.

****** AD 3.9 Markings and markers**

Brief description of final approach and take-off area and taxiway markings and markers, including-

- (a) final approach and take-off markings;
- (b) taxiway markings, air taxiway markers and air transit route markers; and

- (c) remarks.

****** AD 3.10 Heliport obstacles**

#OBS-DS# Detailed description of obstacles, including—

- (a) obstacle identification or designation;
- (b) type of obstacle;
- (c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
- (d) obstacle elevation and height to the nearest meter or foot;
- (e) obstacle marking, and type and colour of obstacle lighting (if any); and
- (f) NIL indication, if appropriate.

****** AD 3.11 Meteorological information provided**

Detailed description of meteorological information provided at the heliport and an indication of which meteorological office is responsible for the service enumerated, including—

- (a) name of the associated meteorological office;
- (b) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- (c) office responsible for preparation of TAFs, and periods of validity of the forecasts;
- (d) availability of the trend forecasts for the heliport, and interval of issuance;
- (e) information on how briefing and/or consultation is provided;
- (f) type of flight documentation supplied and language(s) used in flight documentation;
- (g) charts and other information displayed or available for briefing or consultation;
- (h) supplementary equipment available for providing information on meteorological conditions, for instance, weather radar and receiver for satellite images;
- (i) the ATS unit provided with meteorological information; and
- (j) additional information concerning any limitation of service.

****** AD 3.12 Heliport data**

Detailed description of heliport dimensions and related information, including—

- (a) heliport type (surface-level, elevated or helideck);
- (b) touchdown and lift-off (TLOF) area dimensions to the nearest meter or foot;
- (c) true bearings to one-hundredth of a degree of final approach and take-off (FATO) area;
- (d) dimensions to the nearest meter or foot of FATO, and surface type;
- (e) surface and bearing strength in tonnes (1 000 kg) of TLOF;
- (f) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric center of TLOF or of each threshold of FATO—
 - (i) for non-precision approaches, to the nearest meter or foot; and
 - (ii) for precision approaches, to the nearest tenth of a meter or tenth of a foot;
- (g) TLOF or FATO slope and elevation—
 - (i) for non-precision approaches, to the nearest meter or foot; and
 - (ii) for precision approaches, to the nearest tenth of a meter or tenth of a foot;
- (h) dimensions of safety area;
- (i) dimensions, to the nearest meter or foot, of helicopter clearway;
- (j) the existence of an obstacle-free sector; and
- (k) remarks.

****** AD 3.13 Declared distances**

Detailed description of declared distances to the nearest meter or foot, where relevant for a heliport, including—

- (a) take-off distance available, and if applicable, alternative reduced declared distances;
- (b) rejected take-off distance available;
- (c) landing distance available; and
- (d) remarks, including entry or start point where alternative reduced declared distances have been declared.

****** AD 3.14 Approach and FATO lighting**

Detailed description of approach and FATO lighting, including—

- (a) type, length and intensity of approach lighting system;
- (b) type of visual approach slope indicator system;
- (c) characteristics and location of FATO area lights;
- (d) characteristics and location of aiming point lights;
- (e) characteristics and location of TLOF lighting system; and
- (f) remarks.

****** AD 3.15 Other lighting and secondary power supply**

Description of other lighting and secondary power supply, including—

- (a) location, characteristics and hours of operation of heliport beacon;
- (b) location and lighting of wind direction indicator (WDI);
- (c) taxiway edge and taxiway center line lights;
- (d) secondary power supply including switch-over time; and
- (e) remarks.

****** AD 3.16 Air traffic services airspace**

#AIP-DS# Detailed description of air traffic services (ATS) airspace organised at the heliport, including—

- (a) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- (b) vertical limits;
- (c) airspace classification;
- (d) call sign and language(s) of ATS unit providing service;
- (e) transition altitude;
- (f) hours of applicability; and
- (g) remarks.

****** AD 3.17 Air traffic services communication facilities**

Detailed description of ATS communication facilities established at the heliport, including:

- (a) service designation;
- (b) call sign;
- (c) channel;
- (d) SATVOICE number, if available;
- (e) logon address, as appropriate;
- (f) hours of operation; and
- (g) remarks.

****** AD 3.18 Radio navigation and landing aids**

(1) #AIP-DS# Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the heliport, including—

- (a) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS and GBAS, and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;

- (b) identification, if required;
 - (c) frequency, channel number, service provider and reference path identifier (RPI), as appropriate;
 - (d) hours of operation, as appropriate;
 - (e) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
 - (f) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft), elevation of GBAS reference point to the nearest meter or foot, and the ellipsoid height of the point to the nearest meter or foot. For SBAS, the ellipsoid height of the landing threshold point (LTP) or the fictitious threshold point (FTP) to the nearest meter or foot;
 - (g) service volume radius from the GBAS reference point to the nearest kilometer or nautical mile; and
 - (h) remarks.
- (2) When the same aid is used for both en-route and heliport purposes, a description shall also be given in section ENR 4.
- (3) If the GBAS serves more than one heliport, description of the aid shall be provided under each heliport.
- (4) If the operating subregulation of the facility is other than the designated governmental agency, the name of the operating subregulation shall be indicated in the remarks column. Facility coverage shall be indicated in the remarks column.

****** AD 3.19 Local heliport regulations**

Detailed description of regulations applicable to the use of the heliport, including the acceptability of training flights, non-radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

****** AD 3.20 Noise abatement procedures**

Detailed description of noise abatement procedures established at the heliport.

****** AD 3.21 Flight procedures**

Detailed description of the conditions and flight procedures, including radar or ADS-B procedures, established on the basis of airspace organisation established at the heliport. When established, detailed description of the low visibility procedures at the heliport, including—

- (a) touchdown and lift-off (TLOF) area and associated equipment authorised for use under low visibility procedures;
- (b) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- (c) description of ground marking or lighting for use under low visibility procedures; and
- (d) remarks.

****** AD 3.22 Additional information**

Additional information about the heliport, such as an indication of bird concentrations at the heliport, together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 3.23 Charts related to a heliport**

- (1) The requirement is for charts related to a heliport to be included in the following order—
 - (a) Aerodrome or Heliport Chart — ICAO;
 - (b) Area Chart — ICAO (departure and transit routes);
 - (c) Standard Departure Chart — Instrument — ICAO;
 - (d) Area Chart — ICAO (arrival and transit routes);
 - (e) Standard Arrival Chart — Instrument — ICAO;
 - (f) ATC Surveillance Minimum Altitude Chart — ICAO;
 - (g) Instrument Approach Chart — ICAO (for each procedure type);
 - (h) Visual Approach Chart — ICAO; and
 - (i) bird concentrations in the vicinity of heliport.
- (2) If some of the charts are not produced, a statement to this effect shall be given in section GEN 3.2.

SCHEDULE 3

Regulation 28

NOTAM FORMAT

INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT

(1) General

The qualifier line (Item Q) and all identifiers (Items A) to G) inclusive) each followed by a closing parenthesis, as shown in the format, shall be transmitted unless there is no entry to be made against a particular identifier.

(2) NOTAM numbering

Each NOTAM shall be allocated a series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year (e.g. A0023/03). Each series shall start on 1 January with number 0001.

(3) Qualifiers (Item Q)

(Item Q) is divided into eight fields, each separated by a stroke. An entry shall be made in each field. Examples of how fields are to be filled are shown in the Aeronautical Information Services Manual (Doc 8126). The definition of the field is as follows—

(a) FIR

- (i) if the subject of the information is located geographically within one FIR, the ICAO location indicator shall be that of the FIR concerned. When an aerodrome is situated within the overlying FIR of another State, the first field of Item Q) shall contain the code for that overlying FIR (e.g. Q) LFRR/...A) EGJJ);
- (ii) if the subject of the information is located geographically within more than one FIR, the FIR field shall be composed of the ICAO nationality letters of the State originating the NOTAM followed by “XX”. (The location indicator of the overlying UIR shall not be used). The ICAO location

indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State; or

- (iii) if one State issues a NOTAM affecting FIRs in a group of States, the first two letters of the ICAO location indicator of the issuing State plus “XX” shall be included. The location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State.

(b) NOTAM CODE

All NOTAM Code groups contain a total of five letters and the first letter is always the letter Q. The second and third letters identify the subject, and the fourth and fifth letters denote the status or condition of the subject reported upon. The two-letter codes for subjects and conditions are those contained in the PANS-ABC (Doc 8400). For combinations of second and third, and fourth and fifth letters, refer to the NOTAM Selection Criteria contained in Doc 8126 or insert one of the following combinations, as appropriate—

- (i) if the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the second and third letters (e.g. QXXAK);
- (ii) if the condition of the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the fourth and fifth letters (e.g. QFAXX);
- (iii) when a NOTAM containing operationally significant information is issued in accordance with Appendix 4 and Chapter 6 and when it is used to announce the existence of AIRAC AIP Amendments or supplements, insert “TT” as the fourth and fifth letters of the NOTAM Code;
- (iv) when a NOTAM is issued containing a checklist of valid NOTAM, insert “KKKK” as the second, third, fourth and fifth letters; and

- (v) the following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:

AK = RESUMED NORMAL OPERATION

AL = OPERATIVE (OR RE-OPERATIVE) SUBJECT TO PREVIOUSLY PUBLISHED LIMITATIONS OR CONDITIONS

AO = OPERATIONAL

CC = COMPLETED

CN = CANCELLED

HV = WORK COMPLETED

XX = PLAIN LANGUAGE

(c) TRAFFIC

I = IFR

V = VFR

K = NOTAM is a checklist

(d) PURPOSE

N = NOTAM selected for the immediate attention of flight crew members

B = NOTAM of operational significance selected for PIB entry

O = NOTAM concerning flight operations

M = Miscellaneous NOTAM; not subject for a briefing, but it is available on request

K = NOTAM is a checklist

(e) SCOPE

A = Aerodrome

E = En-route

W = Nav Warning

K = NOTAM is a checklist

(c) LOWER and UPPER

LOWER and UPPER limits shall only be expressed in flight levels (FL) and shall express the actual vertical limits of the area of influence without the addition of buffers. In the case of navigation warnings and airspace restrictions, values entered shall be consistent with those provided under Items F and G.

If the subject does not contain specific height information, insert “000” for LOWER and “999” for UPPER as default values.

(d) COORDINATES, RADIUS

The latitude and longitude accurate to one minute, as well as a three-digit distance figure giving the radius of influence in NM (e.g. 4700N01140E043). Coordinates present approximate center of circle whose radius encompasses the whole area of influence, and if the NOTAM affects the entire FIR/UIR or more than one FIR/UIR, enter the default value “999” for radius.

(4) Item A

Insert the location indicator as contained in ICAO Doc 7910 of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one FIR/UIR may be indicated when appropriate. If there is no available ICAO location indicator, use the ICAO nationality letter as given in ICAO Doc 7910, Part 2, plus “XX” and followed up in Item E) by the name, in plain language. If information concerns GNSS, insert the appropriate ICAO location indicator allocated for a GNSS element or the common location indicator allocated for all elements of GNSS (except GBAS).

(5) Item B

For date-time group use a ten-figure group, giving year, month, day, hours and minutes in UTC. This entry is the date-time at which the NOTAMN comes into force. In the cases of NOTAMR and NOTAMC, the date-time group is the actual date and time of the NOTAM origination. The start of a day shall be indicated by “0000”.

- (6) Item C
With the exception of NOTAMC, a date-time group (a ten-figure group giving year, month, day, hours and minutes in UTC) indicating duration of information shall be used unless the information is of a permanent nature in which case the abbreviation “PERM” is inserted instead. The end of a day shall be indicated by “2359” (i.e. do not use “2400”). If the information on timing is uncertain, the approximate duration shall be indicated using a date-time group followed by the abbreviation “EST”. Any NOTAM which includes an “EST” shall be cancelled or replaced before the date-time specified in Item C.
- (7) Item D
If the hazard, status of operation or condition of facilities being reported on will be active in accordance with a specific time and date schedule between the dates-times indicated in Items B and C, insert such information under Item D. If Item D exceeds 200 characters, consideration shall be given to providing such information in a separate, consecutive NOTAM.
- (8) Item E
Use decoded NOTAM Code, complemented where necessary by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language. When NOTAM is selected for international distribution, English text shall be included for those parts expressed in plain language. This entry shall be clear and concise in order to provide a suitable PIB entry. In the case of NOTAMC, a subject reference and status message shall be included to enable accurate plausibility checks.
- (9) Items F and G
These items are normally applicable to navigation warnings or airspace restrictions and are usually part of the PIB entry. Insert both lower and upper height limits of activities or restrictions, clearly indicating only one reference datum and unit of measurement. The abbreviations GND or SFC shall be used in Item F to designate ground and surface respectively. The abbreviation UNL shall be used in Item G to designate unlimited.

SCHEDULE 4

Regulation 28

SNOWTAM FORMAT

INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

Note.— Origin of data, assessment process and the procedures linked to the surface conditions reporting system are prescribed in the Procedures for Air Navigation Services — Aerodromes.

1. General

- (1) When reporting on more than one runway, repeat Items B to H (aeroplane performance calculation section).
- (2) The letters used to indicate items are only used for reference purpose and should not be included in the messages. The letters, M (mandatory), C (conditional) and O (optional) mark the usage and information and shall be included as explained below.
- (3) Metric units shall be used and the unit of measurement not reported.
- (4) The maximum validity of SNOWTAM is 8 hours. New SNOWTAM shall be issued whenever a new runway condition report is received.
- (5) A SNOWTAM cancels the previous SNOWTAM.
- (6) The abbreviated heading “TTAAiiii CCCC MMYGGgg (BBB)” is included to facilitate the automatic processing of SNOWTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for SNOWTAM = SW;

AA = geographical designator for States, e.g. HU = Uganda, EG = United Kingdom;

iiii = SNOWTAM serial number in a four-digit group;

CCCC = four-letter location indicator of the aerodrome to which the SNOWTAM refers;

MMYYGGgg = date/time of observation/measurement, whereby:

MM = month, e.g. January = 01, December = 12

YY = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = optional group for correction, in the case of an error, to a SNOWTAM message previously disseminated with the same serial number = COR.

Note 1.— Brackets in (BBB) are used to indicate that this group is optional.

Note 2.— When reporting on more than one runway and individual dates/times of observation/assessment are indicated by repeated Item B, the latest date/time of observation/assessment is inserted in the abbreviated heading (MMYYGGgg).

- (7) The text “SNOWTAM” in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group shall be separated by a space, for example: SNOWTAM 0124.
- (8) For readability purposes for the SNOWTAM message, include a line feed after the SNOWTAM serial number, after Item A, and after the aeroplane performance calculation section.
- (9) When reporting on more than one runway, repeat the information in the aeroplane performance calculation section from the date and time of assessment for each runway before the information in the situational awareness section.
- (10) Mandatory information is—
 - (a) aerodrome location indicator;
 - (b) date and time of assessment;

- (c) lower runway designator number;
- (d) runway condition code for each runway third; and
- (e) condition description for each runway third (when runway condition code (RWYCC) is reported 1–5)

2. Aeroplane performance calculation section

Item A— Aerodrome location indicator (four-letter location indicator).

Item B — Date and time of assessment (eight-figure date/time group giving time of observation as month, day, hour and minute in UTC).

Item C — Lower runway designator number (nn[L] or nn[C] or nn[R]).

Note.— *Only one runway designator is inserted for each runway and always the lower number.*

Item D — Runway condition code for each runway third. Only one digit (0, 1, 2, 3, 4, 5 or 6) is inserted for each runway third, separated by an oblique stroke (n/n/n).

Item E — Per cent coverage for each runway third. When provided, insert 25, 50, 75 or 100 for each runway third, separated by an oblique stroke ([n]nn/[n]nn/[n]nn).

Note 1.— *This information is provided only when the runway condition for each runway third (Item D) has been reported as other than 6 and there is a condition description for each runway third (Item G) that has been reported other than DRY.*

Note 2.— *When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).*

Item F — Depth of loose contaminant for each runway third. When provided, insert in millimeter s for each runway third, separated by an oblique stroke (nn/nn/nn or nnn/nnn/nnn).

Note 1.— *This information is only provided for the following contamination types:*

- *standing water; values to be reported 04, then assessed value. Significant changes 3 mm up to and including 15 mm;*

- *slush, values to be reported 03, then assessed value. Significant changes 3 mm up to and including 15 mm;*
- *wet snow, values to be reported 03, then assessed value. Significant changes 5 mm; and*
- *dry snow, values to be reported 03, then assessed value. Significant changes 20 mm.*

Note 2.— When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).

Item G — Condition description for each runway third. Insert any of the following condition descriptions for each runway third, separated by an oblique stroke.

COMPACTED SNOW

DRY SNOW

DRY SNOW ON TOP OF COMPACTED SNOW

DRY SNOW ON TOP OF ICE

FROST

ICE

SLUSH

STANDING WATER

WATER ON TOP OF COMPACTED SNOW

WET

WET ICE

WET SNOW

WET SNOW ON TOP OF COMPACTED SNOW

WET SNOW ON TOP OF ICE

DRY (only reported when there is no contaminant)

Note.— When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).

Item H — Width of runway to which the runway condition codes apply. Insert the width in meter s if less than the published runway width.

3. Situational awareness section

Note 1.— Elements in the situational awareness section end with a full stop.

Note 2.— Elements in the situational awareness section for which no information exists, or where the conditional circumstances for publication are not fulfilled, are left out completely.

Item I — Reduced runway length. Insert the applicable runway designator and available length in meters (example: RWY nn [L] or nn [C] or nn [R] REDUCED TO [n]nnn).

Note.— This information is conditional when a NOTAM has been published with a new set of declared distances.

Item J — Drifting snow on the runway. When reported, insert “DRIFTING SNOW”.

Item K — Loose sand on the runway. When loose sand is reported on the runway, insert the lower runway designator and with a space “LOOSE SAND” (RWY nn or RWY nn[L] or nn[C] or nn[R] LOOSE SAND).

Item L — Chemical treatment on the runway. When chemical treatment has been reported applied, insert the lower runway designator and with a space “CHEMICALLY TREATED” (RWY nn or RWY nn[L] or nn[C] or nn[R] CHEMICALLY TREATED).

Item M — Snow banks on the runway. When snow banks are reported present on the runway, insert the lower runway designator and with a space “SNOW BANK” and with a space left “L” or right “R” or both sides “LR”, followed by the distance in meter s from center line separated by a space FM CL (RWY nn or RWY nn[L] or nn[C] or nn[R] SNOW BANK Lnn or Rnn or LRnn FM CL).

Item N — Snow banks on a taxiway. When snow banks are present on a taxiway, insert the taxiway designator and with a space “SNOW BANK” (TWY [nn]n SNOW BANK).

Item O — Snow banks adjacent to the runway. When snow banks are reported present penetrating the height profile in the aerodrome snow plan, insert the lower runway designator and “ADJ SNOW BANKS”

(RWY nn or RWY nn[L] or nn[C] or nn[R] ADJ SNOW BANKS).

Item P — Taxiway conditions. When taxiway conditions are reported as poor, insert the taxiway designator followed by a space “POOR” (TWY [n or nn] POOR or ALL TWYS POOR).

Item R — Apron conditions. When apron conditions are reported as poor, insert the apron designator followed by a space “POOR” (APRON [nnnn] POOR or ALL APRONS POOR).

Item S — Measured friction coefficient. Where reported, insert the measured friction coefficient and friction measuring device.

Note.— This will only be reported for States that have an established programme of runway friction measurement using a State-approved friction measuring device.

Item T — Plain language remarks.

SCHEDULE 5

Regulation 28(6)

ASHTAM FORMAT

INSTRUCTIONS FOR THE COMPLETION OF THE ASHTAM FORMAT

(1) General

- (a) The ASHTAM provides information on the status of activity of a volcano when a change in its activity is, or is expected to be of operational significance. This information is provided using the volcano level of alert colour code given in (3)(e) below.
- (b) In the event of a volcanic eruption producing ash cloud of operational significance, the ASHTAM also provides information on the location, extent and movement of the ash cloud and the air routes and flight levels affected.
- (c) Issuance of an ASHTAM giving information on a volcanic eruption, in accordance with paragraph (3) below, should not be delayed until complete information A) to K) is available but should be issued immediately following receipt of notification that an eruption has occurred or is expected to occur, or a change in the status of activity of a volcano of operational significance has occurred or is expected to occur, or an ash cloud is reported. In the case of an expected eruption, and hence no ash cloud evident at that time, items A) to E) should be completed and items F) to I) indicated as “not applicable”. Similarly, if a volcanic ash cloud is reported, e.g. by special air-report, but the source volcano is not known at that time, the ASHTAM should be issued initially with items A) to E) indicated as “unknown”, and items F) to K) completed, as necessary, based on the special air-report, pending receipt of further information. In other circumstances, if information for a specific field A) to K) is not available indicate “NIL”.

- (d) The maximum period of validity of ASHTAM is 24 hours. New ASHTAM must be issued whenever there is a change in the level of alert.

(2) Abbreviated heading

- (a) Following the usual AFTN communications header, the abbreviated heading “TT AAiiii CCCC MMYGGgg (BBB)” is included to facilitate the automatic processing of ASHTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for ASHTAM = VA;

AA = geographical designator for States, e.g. NZ - New Zealand (see Location Indicators (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = ASHTAM serial number in a four-figure group;

CCCC = four-letter location indicator of the flight information region concerned (see Location Indicators (Doc 7910), Part 5, addresses of centers in charge of FIR/UIR);

MMYYGGgg = date/time of report, whereby:

MM = month, e.g. January - 01, December - 12

YY = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = Optional group for correction to an ASHTAM message previously disseminated with the same serial number - COR.

(3) Content of ASHTAM

- (a) Item A— Flight information region affected, plain-language equivalent of the location indicator given in the abbreviated heading, in this example “Auckland Oceanic FIR”.

- (b) Item B — Date and time (UTC) of first eruption.
- (c) Item C — Name of volcano, and number of volcano as listed in the ICAO Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features.
- (d) Item D — Latitude/Longitude of the volcano in whole degrees or radial and distance of volcano from NAVAID (as listed in the ICAO Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features).
- (e) Item E — Colour code for level of alert indicating volcanic activity, including any previous level of alert colour code follows:

| <i>Level of alert colour code</i> | <i>Status of activity of volcano</i> |
|---------------------------------------|---|
| GREEN ALERT | Volcano is in normal, non-eruptive state. or, after a change from a higher alert level: Volcanic activity considered to have ceased, and volcano reverted to its normal, non-eruptive state. |
| YELLOW ALERT | Volcano is experiencing signs of elevated unrest above known background levels. or, after a change from higher alert level: Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| ORANGE ALERT | Volcano is exhibiting heightened unrest with increased likelihood of eruption. or, Volcanic eruption is underway with no or minor ash emission [specify ash-plume height if possible]. |
| RED ALERT | Eruption is forecasted to be imminent with significant emission of ash into the atmosphere likely. or, Eruption is underway with significant emission of ash into the atmosphere [specify ash-plume height if possible] |

Note; The colour code for the level of alert indicating the status of activity of the volcano and any change from a previous status of activity shall be provided to the area control center by the responsible vulcanological agency in the State concerned, e.g. “RED ALERT FOLLOWING YELLOW” OR “GREEN ALERT FOLLOWING ORANGE”.

- (f) Item F — If volcanic ash cloud of operational significance is reported, indicate the horizontal extent and base/top of the ash cloud using latitude/longitude (in whole degrees) and altitudes in thousands of meters (feet) and/or radial and distance from source volcano. Information initially may be based only on special air-report, but subsequent information may be more detailed based on advice from the responsible meteorological watch office and/or volcanic ash advisory center.
- (g) Item G — Indicate forecast direction of movement of the ash cloud at selected levels based on advice from the responsible meteorological watch office and/or volcanic ash advisory center.
- (h) Item H — Indicate air routes and portions of air routes and flight levels affected, or expected to become affected.
- (i) Item I — Indicate closure of airspace, air routes or portions of air routes, and availability of alternative routes.
- (j) Item J — Source of the information, e.g. “special air-report” or “vulcanological agency”, etc. The source of information should always be indicated, whether an eruption has actually occurred or ash cloud reported, or not.
- (k) Item K — Include in plain language any operationally significant information additional to the foregoing.

SCHEDULE 6

Regulation 32(g)

TERRAIN AND OBSTACLE ATTRIBUTES

Provisional requirements

Table S5-1. Terrain attributes

| Terrain Attribute | Mandatory/Optional |
|-----------------------------|---------------------------|
| Area of coverage | Mandatory |
| Data source identifier | Mandatory |
| Acquisition method | Mandatory |
| Post spacing | Mandatory |
| Horizontal reference system | Mandatory |
| Horizontal resolution | Mandatory |
| Horizontal accuracy | Mandatory |
| Horizontal confidence level | Mandatory |
| Horizontal position | Mandatory |
| Elevation | Mandatory |
| Elevation reference | Mandatory |
| Vertical reference system | Mandatory |
| Vertical resolution | Mandatory |
| Vertical accuracy | Mandatory |
| Vertical confidence level | Mandatory |
| Surface type | Optional |
| Recorded surface | Mandatory |
| Penetration level | Optional |
| Known variations | Optional |
| Integrity Mandatory | Mandatory |
| Date and time stamp | Mandatory |
| Unit of measurement used | Mandatory |

Table S5-2. Obstacle attributes

| Obstacle attribute | Mandatory/Optional |
|-----------------------------|---------------------------|
| Area of coverage | Mandatory |
| Data source identifier | Mandatory |
| Obstacle identifier | Mandatory |
| Horizontal accuracy | Mandatory |
| Horizontal confidence level | Mandatory |
| Horizontal position | Mandatory |
| Horizontal resolution | Mandatory |
| Horizontal extent | Mandatory |
| Horizontal reference system | Mandatory |
| Elevation | Mandatory |
| Height | Mandatory |
| Vertical accuracy | Mandatory |
| Vertical confidence level | Mandatory |
| Vertical resolution | Mandatory |
| Vertical reference system | Mandatory |
| Obstacle type | Mandatory |
| Geometry type | Mandatory |
| Integrity | Mandatory |
| Date and time stamp | Mandatory |
| Unit of measurement used | Mandatory |
| Operations | Optional |
| Effectivity | Optional |
| Lighting | Mandatory |
| Marking | Mandatory |

Cross references

Civil Aviation (Aerodromes) Regulations, 2022

Civil Aviation (Aeronautical Charts) Regulations, 2022

Civil Aviation (Communication Procedures) Regulations, 2022

Civil Aviation (Meteorological Services for Air Navigation Services), 2022

Civil Aviation (Units of Measurement for air and ground Operations) Regulations, 2020.

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