

PART 7—INSTRUMENTS AND EQUIPMENT

INTRODUCTION TO PART 7

Part 7 of these Regulations presents standards and recommended practices as regulatory requirements for instruments and equipment on aircraft expected to operate in Nigeria.

The requirements in Part 7 address two categories of aircraft operations – AOC holder and non-AOC holder operations. The sections of Part 7 applicable to all aircraft address minimum requirements and are noted by the key AAC preceding the particular section. It is important to note that the AAC designation also applies to all aircraft. Additional aircraft requirements relating to commercial air transport are noted by the key AOC for air operator certificate holders. Note: ICAO Annex 6, Part 1: 4.2.1.1 and Part III, Section II: 2.2.1.1 require that operators in commercial air transport have an air operator certificate.

In some instances, certain items such as Mach meters or sea anchors apply only to aircraft with performance characteristics requiring such items. Some AAC requirements apply to passenger-carrying aircraft. In such instances, the requirement addresses the operation of any passenger-carrying aircraft, most particularly turbine powered aircraft, which may have performance and range capabilities matching the type of aircraft operated by AOC holders. Similarly, some equipment specified for the [AOC] aircraft have sections keyed as AAC.

The key AAC applies to all aircraft, whether on domestic or international flights. The key AOC applies to AOC holders operating in Nigeria, whether on domestic or international flights. Certain sections, such as those addressing MNPS airspace, may not address airspace contiguous to Nigeria, but anticipate that Nigerian AOC holder's aircraft may operate through such airspace in the course of commerce. Such requirements are intended to facilitate the integration of Nigerian AOC holders into such operations.

Part 7 includes survival equipment requirements that apply for operation in Nigeria as listed in ICAO Annex 6. The Authority is encouraged to review geographic areas within Nigeria, and designate those areas requiring additional, specific types of survival equipment.

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PART 7—INSTRUMENTS AND EQUIPMENT

7.1 Part 7 has been written so that approvals to AOC holder are done through operations specifications and approvals to non-AOC holders, such as general aviation, are done through letters of authorisation. General.

7.1.1.1.—(a) Part 7 of these Regulations prescribes the minimum instrument and equipment requirements for all aircraft in all operations. Applicability.

(b) Part 7 of these Regulations requirements use the following key designators—

(1) AAC: all aircraft — non-AOC Holders and AOC Holders appropriate to the subject of the regulations, e.g., an all aircraft regulation may only refer to seaplanes, but will include seaplanes operated by non-AOC Holders and AOC seaplanes.

(2) AOC: AOC Holders are operators engaged in commercial air transport. Where AOC requirements are more detailed, the AOC requirements shall be followed.

7.1.1.2.—(a) For the purpose of Part 7, the following definitions shall apply— Definitions.

(1) *Area Navigation (RNAV)*—A method of navigation that permits aircraft operations on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these. (Note: ICAO definition in Annex 11)

(2) *Category One Operation (CAT I)*—A precision instrument approach and landing with a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m.

(3) *Category Two Operation (CAT II)*—A precision instrument approach and landing with a decision height lower than 60 m (200 ft) but no lower than 30 m (100 ft) and a visual range not less than 350 m.

(4) *Category Three A (CAT IIIA) —Operation* A precision approach and landing with :

- (i) A decision height lower than 30 m (100 ft) or no decision height ; and
- (ii) A runway visual range not less than 200 m.

(5) *Category Three B (CAT IIIB) Operation*—A precision approach and landing with :

- (i) A decision height lower than 15 m (50 ft) or no decision height ; and
- (ii) A runway visual range less than 200 m but not less than 50 m.

(6) *Category Three C (CAT IIIC) Operation*— A precision instrument approach and landing with no decision height and no runway visual range limitations.

(7) *Controlled Flight Into Terrain*— Occurs when an airworthy aircraft is flown, under the control of a qualified pilot, into terrain (water or obstacles) with inadequate awareness on the part of the pilot of the impending collision.

(8) *Emergency Locator Transmitter (ELT)*—A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

(i) *Automatic fixed ELT*—An automatically activated ELT which is permanently attached to an aircraft.

(ii) *Automatic portable ELT*—An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.

(iii) *Automatically deployable ELT*—An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and in some cases, also be hydrostatic sensors. Manual deployment is also provided.

(iv) *Survival ELT*—An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

(9) *ELT battery expiration date*—The date of battery manufacture or recharge plus one half of its useful life.

(10) *ELT battery useful life*—The length of time after its date of manufacture or recharge that the battery or battery pack may be stored under normal environmental conditions without losing its ability to allow the ELT to meet the applicable performance standards.

(11) *Enhanced Ground Proximity Warning System (EGPWS)*—A forward looking warning system that uses the terrain data base for terrain avoidance.

(12) *Flight Recorder*—Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation. This could include the cockpit voice recorder (CVR) or flight data recorder (FDR).

(13) *Ground Proximity Warning System (GPWS)*—A warning system that uses radar altimeters to alert the pilots of hazardous flight conditions.

(14) *High Speed Aural Warning*—A speed warning that is required for turbine-engined airplanes and airplanes with a VMO/MMO greater than 0.80 VDF/MDF or VD/MD.

(15) *Long Range Overwater Flights*—Routes on which an aeroplane may be over water and at more than a distance corresponding to 120 minutes at cruising speed or 740 km (400 NM), whichever is the lesser, away from land suitable for making an emergency landing.

(16) *Low Altitude Wind Shear Warning and Guidance System*—A system that issues a warning of low altitude wind shear and in some cases provide the pilot with guidance information of the escaper manoeuvre.

(17) *Mach Number Indicator*—An indicator that shows airspeed as a function of the Mach number.

(18) *Required Navigation Performance (RNP)*—A statement of the navigation performance necessary for operations with a defined airspace.

(19) *Terrain Awareness Warning System*—A system that provides the flight crew with sufficient information and alerting to detect a potentially hazardous terrain situation and so the flight crew may take effective action to prevent a controlled flight into terrain (CFIT) event.

7.1.1.3.—(a) The following acronyms are used in Part 7:

Abbreviations.

- (1) *AAC*—All aircraft
- (2) *ADF*—Automatic Direction Finder
- (3) *AFM*—Aeroplane Flight Manual
- (4) *ELT(AD)*—Automatically deployable ELT
- (5) *ELT(AF)*—Automatic fixed ELT
- (6) *ELT(AP)*—Automatic portable ELT
- (7) *ELT(S)*—Survival ELT.
- (8) *AOC* - Air Operator Certificate.
- (9) *CAT*—Commercial Air Transport
- (10) *CATI*—Category One.
- (11) *CATII*—Category Two.
- (12) *CATIIIA*—Category Three A
- (13) *CATIIIB*—Category Three B.
- (14) *CATIIIC*—Category Three C.
- (15) *CFIT*—Controlled Flight Into Terrain.
- (16) *CVR*—Cockpit Voice Recorder.
- (17) *DH*—Decision Height.
- (18) *DME*—Distance Measuring Equipment.
- (19) *ELT*—Emergency Locator Transmitter.
- (20) *FDR*—Flight Data Recorder.
- (21) *GPS*—Global Positioning System.
- (22) *GPWS*—Ground Proximity Warning System.
- (23) *ILS*—Instrument Landing System.
- (24) *IFR*—Instrument Flight Rules.
- (25) *IMC*—Instrument Meteorological Conditions.
- (26) *LRNS*—Long Range Navigation Systems.
- (27) *MACH*—Mach Number Indicator.
- (28) *MEL*—Minimum Equipment List.
- (29) *MHz*—Megahertz.

- (30) *MLS*—Microwave Landing System.
- (31) *MNPS*—Minimum Navigation Performance Specifications.
- (32) *NDB*—Nondirectional Beacon.
- (33) *PBE*—Protective Breathing Equipment.
- (34) *RNAV*—Area Navigation.
- (35) *RNP*—Required Navigation Performance.
- (36) *RVR*—Runway Visual Range.
- (37) *RVSM*—Reduced Vertical Separation Minimum.
- (38) *SSR*—Secondary Surveillance Radar.
- (39) *TAWS*—Terrain Awareness Warning System.
- (40) *VFR*—Visual Flight Rules.
- (41) *VMC*—Visual Meteorological Conditions.
- (42) *VOR*—VHF Omnidirectional Radiorange.
- (43) *VSM*—Vertical Separation Minimum.

General
Instrument
and
Equipment
Requirements.

7.1.1.4.—(a) [AAC] In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in this Part shall be installed or carried, as appropriate, in aircraft according to the aircraft use and to the circumstances under which the flight is to be conducted.

(b) [AAC] All required instruments and equipment shall be approved and installed in accordance with applicable airworthiness requirements.

(c) [AAC] Prior to operation in Nigeria of any aircraft not registered in Nigeria that uses an airworthiness inspection program approved or accepted by the State of Registry, the owner/operator shall ensure that instruments and equipment required by Nigeria but not installed in the aircraft are properly installed and inspected in accordance with the requirements of the State of Registry.

(d) [AOC] No person shall commence a flight in commercial air transport operations unless the required equipment—

(1) Meets the minimum performance standard, all operational and airworthiness requirements and the relevant provisions of ICAO Annex 10, Volume IV.

(2) Is installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the inability to communicate and/or navigate safely on the route being flown.

(3) Is in operable condition for the kind of operation being conducted, except as provided in the MEL.

(e) [AAC] If equipment is to be used by one flight crew member at his or her station during flight, it shall be installed so as to be readily operable from that flight crewmember's station.

(f) [AAC] When a single item of equipment is required to be operated by more than one flight crew member, it shall be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.

7.2. FLIGHT INSTRUMENTS

7.2.1.1.— (a) [AAC] All aircraft shall be equipped with flight instruments which will enable the flight crew to—

General Requirements.

- (1) Control the flight path of the aircraft ;
- (2) Carry out any required procedural manoeuvres; and
- (3) Observe the operating limitations of the aircraft in the expected operating conditions.

(b) [AAC] When a means is provided 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.

(c) [AAC] Those instruments that are used by any one pilot shall be so arranged as to permit the pilot to see the indications readily from his or her station, with the minimum practicable deviation from the position and line of vision which he normally assumes when looking forward along the flight path.

7.2.1.2.— (a) [AAC] No person may operate any powered aircraft unless it is equipped with the following flight instruments:

Minimum Flight Instruments

- (1) An airspeed indicating system calibrated in knots, miles per hour or kilometers per hour.
- (2) Sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight.
- (3) An accurate timepiece indicating the time in hours, minutes, and seconds.
- (4) A magnetic compass.
- (5) Any other equipment as prescribed by the Authority.

7.2.1.3.—(a) [AAC] Whenever two pilots are required, each pilot's station shall have separate flight instruments as follows:

Instruments for Operations Requiring two Pilots in day VFR.

- (1) An airspeed indicator calibrated in knots, miles per hour or kilometers per hour;
- (2) A sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;

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Instruments
Required for
IFR
Operations.

- (3) A vertical speed indicator ;
- (4) A turn and slip indicator, or a turn co-coordinator incorporating a slip indicator ;
- (5) An attitude indicator;
- (i) A stabilised direction indicator, and
- (ii) Any other equipment as required by the Authority.

7.2.1.4— (a) [AAC] In addition to the requirements in 7.2.1.1, all aircraft when operated in IFR, or when the aircraft cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with—

(1) An airspeed indicating system with a means of preventing malfunctioning due to either condensation or icing ;

(2) [AOC] An additional sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight ;

(3) A turn and slip indicator for aeroplanes or a slip indicator for helicopters ;

(4) Attitude indicator (artificial horizon) :

(i) For aeroplane - one attitude indicator,

(ii) For helicopters –

(A) [AOC] three attitude indicators, one of which may be replaced by a turn indicator ;

(B) [AAC] – two attitude indicators, one of which may be replaced by a turn indicator ;

(5) A heading indicator (directional gyroscope) ;

(6) A means of indicating whether the supply of power to the gyroscopic instruments is adequate ;

(7) A means of indicating in the flightcrew compartment the outside air temperature ;

(8) A rate-of-climb and descent indicator ;

(9) [AOC] helicopters – a stabilisation system, unless it has been demonstrated to the satisfaction of the certifying Authority that the helicopter possesses, by nature of its design, adequate stability without such a system ;

(10) The requirements of items 3, 4, 5 may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the separate instruments are retained ; and

(11) Such additional instruments or equipment as may be prescribed by the Authority.

(b) [AOC] No person may operate an aeroplane under IFR, or under VFR over routes that cannot be navigated by reference to visual landmarks, unless the aeroplane is equipped with navigation equipment in accordance with the requirements of air traffic services in the area(s) of operation.

(c) [AOC] No person may conduct single pilot IFR operations unless the aeroplane is equipped with an autopilot with at least altitude hold and heading mode.

(d) [AAC] No person may operate an aeroplane under IFR unless it is equipped with an audio selector panel accessible to each required flight crewmember.

(e) [AOC] No person may conduct single pilot IFR or night operations in commercial air transport operations unless the aeroplane is equipped with a headset with boom microphone or equivalent and a transmit button on the control wheel.

7.2.1.5— (a) [AAC] No person may operate an aeroplane with a maximum certified take-off mass exceeding 5,700 kg or a performance Class 1 or 2 helicopter unless it is equipped with a single standby attitude indicator (artificial horizon) that—

Standby
Attitude
Indicator.

(1) Operates independently of any other attitude indicating system ;

(2) Is powered continuously during normal operation ; and

(3) 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.

(b) [AAC] When the standby attitude indicator is being operated by emergency power, it shall be clearly operating and illuminated to the flight crew.

(c) [AAC] 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.

(d) [AAC] If the standby attitude instrument system is installed and usable through flight attitudes of 360° of pitch and roll, the turn and slip indicators may be replaced by slip indicators.

7.2.1.6— (a) The instruments and equipment listed in this subsection shall be installed, approved and maintained in accordance with IS: 7. 2.1.6 for each aircraft operated in a Category II operation :

Instruments
and
Equipment
for Category
II
Operations.

(1) [AAC] Group I is comprised of the following equipment and this equipment must be inspected both within three calendar months of the previous inspection and must also have a bench inspection within 12 months of the previous bench inspection using procedures contained in the approved maintenance program.

(i) Two localizer and glide slope receiving systems.

(ii) A communications system that does not affect the operation of at least one of the ILS systems.

- (iii) A marker beacon receiver that provides distinctive aural and visual indications of the outer and the middle markers.
- (iv) Two gyroscopic pitch and bank indicating systems.
- (v) Two gyroscopic direction indicating systems.
- (vi) Two airspeed indicators.
- (vii) Two sensitive altimeters adjustable for barometric pressure, having markings at 20 foot intervals and each having a placarded correction for altimeter scale error and for the wheel height of the aircraft.
- (viii) One self-monitoring radio altimeter with dual display.
- (ix) Two vertical speed indicators.
- (x) A flight control guidance system that consists of either an automatic approach coupler or a flight director system.
- (xi) For Category II operations with decision heights below 150 feet a radio altimeter is required.

(2) [AAC] Group II is comprised of the following equipment and this equipment with the exception of the static system, does not require special maintenance procedures other than those necessary to retain the original approval condition. Group II equipment must be inspected within 12 months of the previous inspection using procedures contained in the approved maintenance program.

- (i) Warning systems for immediate detection by the pilot of system faults in items (a)(1)(i), (a)(1)(iv), (a)(1)(v) and (a)(1)(ix), of Group I
- (ii) Dual controls.
- (iii) An externally vented static pressure system with an alternate static pressure source.
- (iv) A windshield wiper or equivalent means of providing adequate cockpit visibility for a safe visual transition by either pilot to touchdown and rollout.
- (v) A heat source for each airspeed system pitot tube installed or an equivalent means of preventing malfunctioning due to icing of the pitot system.

Instruments and Equipment for Category III Operations.

7.2.1.7— (a) [AAC] The instruments and equipment listed in this subsection shall be installed, approved and maintained in accordance with international acceptable criteria and the AFM in each aircraft operated in a Category III operation :

(b) [AAC] Airborne systems for CAT IIIA minima not less than RVR 200 m (600 ft). The following equipment in addition to the instrument and navigation equipment required by this Part for IFR flight and CAT II operations is the minimum aircraft equipment required for CAT IIIA :

(1) A redundant flight control or guidance system demonstrated in accordance with international acceptable criteria. Acceptable flight guidance or control systems include the following—

- (i) A Fail Operational or Fail Passive automatic landing system as least to touchdown ;
- (ii) A Fail Operational or Fail Passive manual flight guidance system providing suitable head-up or head-down command guidance, and suitable monitoring capability at least to touchdown ;

(iii) A hybrid system, using automatic landing capability as the primary means of landing at least to touchdown ; or

(iv) Other system that can provide an equivalent level of performance and safety.

(2) An automatic throttle or automatic thrust control system that meets approved criteria as specified in the AFM. However, for operations with a 15 m (50 ft) DH, or other operations that have been specifically evaluated such as for engine inoperative landing capability, automatic throttles may not be required if it has been demonstrated that operations can be safely conducted, with an acceptable work load, without their use.

(3) At least two independent navigation receivers/sensors providing lateral and vertical position or displacement information, typically with the first pilot's station receiving the information from one and the second pilot's station receiving the information from the other. The navigation receivers/sensors shall meet the criteria specified for CAT IIIA operations.

(4) At least two approved radio altimeter systems that meet the performance requirements criteria as specified in the AFM, typically with the first pilot's station receiving information from one and the second pilot's station receiving information from the other.

(5) Failure detection, annunciation, and warning capability, as determined acceptable by criteria in the AFM.

(6) Missed approach guidance provided by one or more of the following means :

(i) Attitude displays that include suitable pitch attitude markings, or a pre-established computed pitch command display.

(ii) An approved flight path angle display, or

(iii) An automatic or flight guidance go-around capability.

(7) Suitable forward and side flight deck visibility for each pilot as specified in the AFM.

(8) Suitable windshield rain removal, ice protection, or defog capability as specified in the AFM.

(c) [AAC] Airborne systems for CAT IIIB minima less than RVR 200 m (600 ft) but not less than RVR 125 m (400 ft). The following equipment in addition to the instrument and navigation equipment required by this Part for IFR flight and CAT II and CAT IIIA operations is the minimum aircraft equipment required for CAT IIIB plus the following extra equipment requirements :

(1) A redundant flight control or guidance system demonstrated in accordance with international acceptable criteria. Acceptable flight guidance or control systems include the following –

(i) A Fail Operational landing system with a Fail Operational or Fail Passive automatic rollout system; or

(ii) A Fail Passive landing system, limited to touchdown zone RVR not less than RVR 200 m (600 ft), with Fail Passive rollout provided automatically or by a flight guidance system providing suitable head-up or head-down guidance, and suitable monitoring capability, or

(iii) A Fail Operational hybrid automatic landing and rollout system with comparable manual flight guidance system, using automatic landing capability as the primary means of landing ; or

(iv) Other system that can provide an equivalent level of performance and safety.

(2) An automatic throttle or automatic thrust control that meets the appropriate criteria as specified in the AFM. However for operations with a 15 m (50 ft) DH, automatic throttles may not be required if it has been demonstrated that operations can safely be conducted, with an acceptable work load, without their use.

(3) At least two independent navigation receivers/sensors providing lateral and vertical position or displacement information, typically with the first pilot's station receiving information from one and the second pilot's station receiving information from the other. The navigation receivers/sensors shall meet the criteria specified in the AFM.

(4) At least two approved radio altimeter systems that need the performance criteria outlined in the AFM, typically with the first pilot's station receiving information from one and the second pilot's station receiving information from the other.

(5) Failure detection, annunciation and warning capability as specified in the AFM.

(6) Missed approach guidance provided by one or more of the following means:

(i) Attitude displays that include calibrated pitch attitude markings, or a pre-established computed pitch command display ; or

(ii) An approved flight path angle display, or

(iii) An automatic or flight guidance go-around capability.

(7) Suitable forward and side flight deck visibility for each pilot, as specified in the AFM.

(8) Suitable windshield rain removal, ice protection, or defog capability as specified in the AFM.

(d) [AAC] Airborne systems for CAT IIIC minima less than RVR 75 m (300 ft). The following equipment in addition to the instrument and navigation equipment required by this Part for IFR flight and CAT II, CAT IIIA and CAT IIIB operations is the minimum aircraft equipment required for CAT IIIC :

(1) A Fail Operational Automatic Flight Control System, or manual flight guidance system designed to meet fail operational system criteria, or a hybrid system in which both the fail-passive automatic system and the monitored manual flight guidance components provide approach and flare guidance to touchdown, and in combination provide full fail operational capability, and

(2) A fail operational automatic, manual, or hybrid rollout control system.

7.3 COMMUNICATIONS EQUIPMENT

7.3.1.1—(a) [AAC] No person may operate an aircraft unless it is equipped with radio communication equipment required for the kind of operation being conducted.

Radio
Equipment.

(b) [AAC] All aircraft operated in VFR as a controlled flight, in IFR, at night, extended flight over water, or over land designated by the Authority as especially difficult for search and rescue, shall be equipped with radio communication equipment—

(1) Capable of conducting two-way communication at any time with air traffic services or aeronautical stations ;

(2) Capable of conducting communications on those frequencies prescribed by the Authority,

(3) Capable of receiving meteorological information at any time during the flight ;

(4) Capable of conducting communications on the aeronautical emergency frequency 121.5Mhz ;

(5) Approved and installed in accordance with the requirements applicable to them, including the minimum performance requirements ;

(6) Installed such that the failure of any single unit required for communication equipment will not result in the failure of another unit required for communications purposes ; and

(7) Meeting any other requirements as prescribed by the Authority.

(c) [AOC] No person may operate an aircraft in commercial air transport operations, or as otherwise specified by the Authority, unless it is equipped with two independent radio communications systems, appropriate to the route and airspace used.

(d) [AOC] When more than one communications equipment unit is required, 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.

(e) [AOC] No person may operate an aircraft in commercial air transport operations unless it is equipped with a boom or throat microphone available at each required flight crew member flight duty station.

7.3.1.2— (a) [AOC] No person may operate an aeroplane in commercial air transport operations on which a flight crew of more than one is required unless it is equipped with a flight crew interphone system, including headsets and microphones, not of a handheld type, for use by all members of the flight crew.

Flightcrew
and Crew
Member
Interphone
System for
Aeroplanes.

(b) [AOC] No person may operate an aeroplane in commercial air transport operations with a maximum certified take-off mass exceeding 15,000 kg, or having an approved passenger seating capacity of 19 or more, or having a flight crew

compartment door, unless it is equipped with a crew member interphone system that—

(1) Operates independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices.

(2) Provides a means of two-way communication between the flight crew compartment and each—

(i) Passenger compartment ;

(ii) Galley located other than on a passenger deck level; and

(iii) Remote crew compartment that is not on the passenger deck and is not easily accessible from a passenger compartment.

(3) Is readily accessible for use—

(i) From each of the required flight crew stations in the flight crew compartment; and

(ii) At required cabin crew member stations close to each separate or pair of floor level emergency exits.

(4) Has an alerting system incorporating aural or visual signals for use by flight crewmembers to alert the cabin crew, and for use by cabin crewmembers to alert the flight crew in the event of suspicious activity or security breaches in the cabin.

(5) Has a means for the recipient of a call to determine whether it is a normal call or an emergency call.

(6) Provides on the ground a means of two-way communication between ground personnel and at least two flight crew members.

Public
Address
System—
AOC
Holders.

7.3.1.3— (a) [AOC] No AOC holder may operate a passenger carrying aeroplane with a maximum approved passenger seating configuration of more than 19 unless a public address system is installed that—

(1) Operates independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices.

(2) Be readily accessible for immediate use from each required flight crew member station.

(3) For each required floor level passenger emergency exit which has an adjacent cabin crew seat, has a microphone which is readily accessible to the seated cabin crew member, except that one microphone may serve more than one exit, provided the proximity of the exits allows unassisted verbal communication between seated cabin crew members.

(4) Is capable of operation within 10 seconds by a cabin crew member at each of those stations in the compartment from which its use is accessible.

(5) Is audible and intelligible at all passenger seats, toilets, and cabin crew seats and workstations.

(b) [AOC] No AOC holder may operate a passenger carrying helicopter with a maximum approved passenger seating configuration of more than 19 unless a public address system is installed that—

(1) Operates independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices.

(2) Be readily accessible for immediate use from each required flight crew member station.

(3) For each required floor level passenger emergency exit which has an adjacent cabin crew seat, has a microphone which is readily accessible to the seated cabin crew member, except that one microphone may serve more than one exit, provided the proximity of the exits allows unassisted verbal communication between seated cabin crew members.

(4) Is capable of operation within 10 seconds by a cabin crew member at each of those stations in the compartment from which its use is accessible.

(5) Is audible and intelligible at all passenger seats, toilets, and cabin crew seats and workstations.

(6) Following a total failure of the normal electrical generating system, provide reliable operation for a minimum of 10 minutes.

(c) [AOC] No AOC holder may operate a passenger carrying helicopter with a maximum approved passenger seating configuration of more than 9 but less than 19 without a public address system installed unless—

(1) The helicopter is designed without a bulkhead between pilot and passengers; and

(2) The operator is able to demonstrate in a manner acceptable to the Authority that when in flight, the pilot's voice is audible and intelligible at all passenger seats.

7.4 NAVIGATION EQUIPMENT

7.4.1.1— (a) [AAC] No person may operate an aircraft unless it is equipped with navigation equipment that shall enable it to proceed in accordance with—

Navigation
Equipment—
General.

(1) Its operational flight plan ; and

(2) The requirements of air traffic services.

(b) No person may operate flights in defined portions of airspace, including MNPS, RVSM, or on routes where an RNP (required navigational performance) Type(s) has been prescribed unless it—

(1) Has received authorisation by the Authority in either operations specifications for AOC holders or letter of authorisation for non-AOC holders ;

(2) Is equipped with the navigation equipment to enable it to operate in accordance with the prescribed RNP type(s) ; and

(3) Is equipped with navigation equipment that continuously provides information to the flightcrew of adherence to or departure from track with respect to the required degree of accuracy at any point along that track.

(c) No person may operate an aircraft unless it has sufficient navigation equipment that will enable the aircraft to navigate in accordance with paragraphs (a) and (b) above, such that—

(1) In the event of the failure of any piece of navigation equipment at any stage of flight, the remaining equipment will enable the aircraft to continue to navigate; and

(2) The failure of any single unit required for either communications or navigation purposes or both will not result in the failure of another unit required for communications or navigation purposes.

(d) The equipment requirements in paragraph (a) does not apply in instances where the Authority has authorised VFR by visual reference to landmarks.

(e) [AAC] No person may operate an aeroplane under IFR, or under VFR over routes that cannot be navigated by reference to visual landmarks, unless the aeroplane is equipped with navigation equipment in accordance with the requirements of air traffic services in the area(s) of operation.

(f) [AAC] All aircraft intended to land in IMC or at night shall be provided with radio navigation equipment capable of receiving signals providing guidance to—

(1) A point from which a visual landing can be effected ; or

(2) Each aerodrome at which it is intended to land in IMC; and

(3) Any designated alternate aerodromes.

Minimum
Navigation
Performance
Specifications
(MNPS).

7.4.1.2.— (a) [AAC] No person may operate an aeroplane in MNPS airspace unless it is equipped with navigation equipment that-

(1) Continuously provides indications to the flightcrew of adherence to or departure from track to the required degree of accuracy at any point along that track ; and

(2) Has been authorised by the Authority for MNPS operations concerned through either operations specifications for AOC holders or letter of authorisation for general aviation.

(b) [AAC] The navigation equipment required for operations in MNPS airspace shall be visible and usable by either pilot seated at his duty station.

(c) [AAC] For unrestricted operation in MNPS airspace an aeroplane shall be equipped with two independent Long-Range Navigation Systems (LRNS).

(d) [AAC] For operation in MNPS airspace along notified special routes, an aeroplane shall be equipped with one LRNS, unless otherwise specified.

7.4.1.3 (a) [AAC] For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, a reduced vertical separation minimum (RVSM) of 300 m (1,000 ft) is applied between FL 290 and FL 410 inclusive, an aeroplane :

Reduced
Vertical
Separation
Minimum.

(1) Shall be provided with equipment that is capable of :

- (i) Indicating to the flightcrew the flight level being flown ;
- (ii) Automatically maintaining a selected flight level ;
- (iii) Providing an alert to the flightcrew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed + or – 90 m (300 ft) ; and
- (iv) Automatically reporting pressure-altitude and

(2) Shall be authorised for operations in the airspace concerned by –

- (i) The State of Operator for AOC holders through operations specifications, or
 - (ii) The State of Registry for non-AOC holders through letter of authorisation.
- (b) Prior to granting an RVSM approval required by paragraph (a)(2), the Authority shall be satisfied that :

(1) The vertical navigation performance capability of the aeroplane satisfies the requirements specified in ICAO Annex 6, Part I, Appendix 4 (AOC) and ICAO Annex 6, Part II, Appendix 2 (General Aviation).

(2) The operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes ; and

(3) The operator has instituted appropriate flightcrew procedures for operations in RVSM airspace.

(c) RVSM. The Authority in consultation with the State of Registry, if appropriate, shall ensure that, in respect of those aeroplanes mentioned in item (a)(2) above, adequate provisions exist for:

(1) Receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with Annex 11, 3.3.4.1; and

(2) Taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operations in airspace where RVSM is applied.

(d) RVSM. The Authority will take appropriate action in respect of aircraft and operators found to be operating in RVSM airspace in NIGERIA without a valid RVSM approval.

7.4.1.4.— (a) Electronic navigation data management. [AAC] No person shall employ electronic navigation data products that have been processed for application in the air and on the ground unless the Authority has approved :

Electronic
Navigation
Data
Management.

(1) The operator's procedures for ensuring that the process applied and the products delivered have acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them ;

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(2) The operator’s program for continual monitoring of both process and products ; and

(3) The operator’s procedures to ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.

Altitude Reporting Transponder.

7.4.1.5.— (a) [AAC] No person may operate an aircraft in airspace that requires a pressure reporting transponder unless that equipment is operative.

(b) [AAC] No person may operate an aircraft at altitudes above FL 290 unless it is equipped with a system that is automatically reporting pressure altitudes.

(c) [AOC] No person may operate an aircraft in commercial air transport operations unless it is equipped with a pressure-altitude reporting transponder that operates in accordance with the requirements of Nigerian air traffic services and ICAO Annex 10, Volume 4.

Global Navigation Satellite System :

7.4.1.6— [AAC] All aircraft shall be equipped with a Global Navigation Satellite System (GNSS) receiver capable of enabling aircraft to determine their precise position anywhere in Nigeria airspace.

7.5 AIRCRAFT LIGHTS AND INSTRUMENT ILLUMINATION

Required Aircraft Lights and Instrument illumination.

7.5.1.1.—(a) [AAC] All aircraft operated at night shall be equipped with:

- (1) A landing light ;
- (2) Navigation/position lights ;
- (3) Illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft ;
- (4) Lights in all passenger compartments ; and
- (5) A flashlight for each crew member station (approval not required).

(b) All aircraft type certificated with aviation red or aviation white anti-collision system shall have the anticollision system operating during both the day and night. In the event of the failure of any light of the anti-collision light system, operation of the aircraft may continue to a location where repairs or replacement can be made.

Required aircraft lights and instrument illumination for commercial air transport operations

7.5.1.2.— (a) [AOC] No person may operate an aircraft in commercial air transport operations unless it is equipped with :

- (1) Two landing lights or a single light having two separately energised filaments ;
- (2) An anti-collision light system ;
- (3) Illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft ;
- (4) Lights in all passenger compartments ;

- (5) A flashlight for each crew member station ;
- (6) Navigation/position lights ; and
- (7) Lights to conform to the International regulations for preventing collisions at sea if the aircraft is a seaplane or an amphibian aircraft.
- (8) For helicopters — a landing light that is trainable, at least in the vertical plane.

7.6 ENGINE INSTRUMENTS

7.6.1.1.—(a) [AAC] Unless the Authority allows or requires different instrumentation for turbine engine powered aeroplanes to provide equivalent safety, no person may operate any powered aircraft without the following engine instruments:

Engine
Instruments.

- (1) A means for indicating fuel quantity in each fuel tank to be used.
- (2) An oil pressure indicator for each engine.
- (3) An oil temperature indicator for each engine.
- (4) A manifold pressure indicator for each altitude engine.
- (5) A tachometer for each engine.

(b) [AOC] Unless the Authority allows or requires different instrumentation for turbine engine powered aeroplanes to provide equivalent safety , in addition to the listed equipment requirements in paragraph (a), no person may operate any powered aircraft without the following engine instruments:

- (1) A carburetor air temperature indicator for each piston engine.
- (2) A cylinder head temperature indicator for each air-cooled piston engine.
- (3) A fuel pressure indicator for each engine.
- (4) A fuel flowmeter or fuel mixture indicator for each engine not equipped with an automatic altitude mixture control ;
- (5) An oil quantity indicator for each oil-tank when a transfer or separate oil reserve supply is used.
- (6) An independent fuel pressure warning device for each engine or a master warning device for all engines with a means for isolating the individual warning circuits from the master warning device.
- (7) A device for each reversible propeller, to indicate to the pilot when the propeller is in reverse pitch, which complies with the following :
 - (i)* The device may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch, but it may not give an indication at or above the normal low pitch stop position.

(ii) The source of indication shall be actuated by the propeller blade angle or be directly responsive to it.

7.7 WARNING INSTRUMENTS AND SYSTEMS

Mach
Number
Indicator.

7.7.1.1—(a) [AAC] All aircraft with speed limitations expressed in terms of Mach number shall be equipped with a Mach number indicator. loss of pressurisation indicator

7.7.1.2 —(a) [AAC] All pressurised aircraft intended to be operated at flight altitudes above 25, 000 feet shall be equipped with a device to provide positive warning to the flightcrew of any dangerous loss of pressurisation.

Landing
Gear
Indicator
Position and
Aural
Warning
Device.

7.7.1.3—(a) [AAC] Each powered civil aircraft with retractable landing gear shall have a landing gear position indicator.

(b) [AOC] Each aeroplane with retractable landing gear shall have an aural warning device that functions continuously under the following conditions :

(1) For aeroplanes with an established approach wing-flap position, whenever the wing flaps are extended beyond the maximum certified approach climb configuration position in the Aeroplane Flight Manual and the landing gear is not fully extended and locked.

(2) For aeroplanes without an established approach climb wing-flap position, whenever the wing flaps are extended beyond the position at which landing gear extension is normally performed and the landing gear is not fully extended and locked.

(c) [AOC] The warning system required by paragraph (b) of this section :

(1) May not have a manual shutoff ;

(2) Shall be in addition to the throttle-actuated device installed under the type certification airworthiness requirements ; and

(3) May utilise any part of the throttle-actuated system including the aural warning device.

(d) [AOC] The flap position-sensing unit required in paragraph (b) may be installed at any suitable place in the aeroplane.

Altitude
Alerting
System.

7.7.1.4—(a) [AAC] No person may operate a turbine powered aeroplane with a maximum certified take-off mass in excess of 5,700 kg or having a maximum approved passenger seating configuration of more than 9 seats, or a turbojet powered aeroplane, unless it is equipped with an altitude alerting system capable of—

(1) Alerting the flightcrew upon approaching preselected altitude in either ascent or descent ; and

(2) Alerting the flightcrew by at least an aural signal, when deviating above or below a preselected altitude.

(b) [AAC] For operations in defined portions of airspace where, based on Regional Air Navigation Agreement, a VSM of 300 m (1,000 ft) is applied above FL

290, an aircraft shall be provided with equipment which is capable of providing an alert to the flightcrew when a deviation occurs from the selected flight level. The threshold for the alert may not exceed ± 90 m (300 ft).

7.7.1.5—(a) [AAC] No operator may operate a turbine-powered aeroplane, or piston-engined aeroplane of a maximum certificated take-off mass in excess of 5,700kg or authorised to carry more than nine passengers, unless it is equipped with a ground proximity warning system that has a forward looking terrain avoidance function.

Ground
Proximity
Warning
System.

(b) [AAC] Each ground proximity warning system shall automatically provide, by means of aural signals which may be supplemented by visual signals, timely and distinctive warning to the flight crew of the following circumstances—:

- (1) Excessive descent rate.
- (2) Excessive terrain closure rate.
- (3) Excessive altitude loss after take-off or go-around.
- (4) Unsafe terrain clearance while not in landing configuration ;
 - (i) Gear not locked down ;
 - (ii) Flaps not in a landing position ; and
- (5) Excessive descent below the instrument glide path.

7.7.1.6—(a) [AOC] No person may operate an aeroplane in commercial air transport in an area where thunderstorms or other potentially hazardous weather conditions may be expected unless it is equipped with a weather radar.

Weather
Radar.

(b) [AOC] No person may operate a helicopter in commercial air transport when carrying passengers in an area where thunderstorms or other potentially hazardous weather conditions may be expected unless it is equipped with a weather radar.

7.7.1.7—(a) [AAC] Any airborne collision avoidance system installed on an aircraft in Nigeria shall be approved by the Authority.

Airborne
Collision
Avoidance
System
(ACAS).

(b) [AAC] Each person operating an aircraft equipped with an airborne collision avoidance system shall have that system on and operating.

(c) [AAC] No person may operate a turbine engine aeroplane for which the individual airworthiness certificate was first issued after 24 November 2005 with a maximum certificated take-off mass in excess of 15,000 kg or authorised to carry more than 30 passengers, unless it is equipped with an ACAS II.

(d) [AAC] No person may operate a turbine engine aeroplane for which the individual airworthiness certificate was first issued after 1 January 2007 with a maximum certificated take-off mass in excess of 5,700 kg but not exceeding 15,000 kg or authorised to carry more than 19 passengers, unless it is equipped with an ACAS II.

(e) [AAC] An airborne collision avoidance system shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume IV.

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(f) [AOC] No person may operate a turbine powered aeroplane with a maximum certificated takeoff mass in excess of 5700 kg or authorised to carry more than 19 passengers, unless it is equipped with an ACAS II.

Forward
Looking
Windshear
Warning
System.

7.7.1.8—(a) [AOC] All turbojet aeroplanes of a maximum certificated takeoff mass in excess of 5700 kg or authorised to carry more than nine passengers shall be equipped with a forward-looking windshear warning system.

(b) [AOC] The system shall be capable of providing the pilot with a timely aural and visual warning of windshear 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 if necessary.

(c) [AOC] 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.

7.8 FLIGHT AND COCKPIT VOICE RECORDERS

Cockpit
voice
recorders.

7.8.1.1—(a) No person may operate the following aircraft unless it is equipped with a cockpit voice recorder capable of recording the aural environment of the flight deck during flight time.

(1) [AOC] All aeroplanes with a maximum certificated takeoff mass of 5 700 kg or greater;

(2) [AAC] All aeroplanes with a maximum certificated take off mass of more than 27 000 kg.

(3) [AOC] All helicopters with a certificated takeoff mass of over 3 180 kg.

(4) [AAC] All helicopters with a certificated takeoff mass of over 7 000 kg.

(b) [AAC] All aeroplanes with a maximum certificated take off mass of more than 5 700 kg but less than 27000 kg shall be equipped with a CVR.

(c) [AAC] A CVR shall be capable of retaining the information recorded during at least the last-

(1) 30 minutes of its operation ; or

(2) 2 hours, for airplanes of a maximum certificated take-off mass of over 5 700 kg or that receive their individual Certificate of Airworthiness after 1 January 2003.

(d) CVR Performance requirements :

(1) The CVR shall be capable of recording on at least four tracks simultaneously

(i) In an in-line format in one direction if a one directional configuration is used,
or

(ii) In both directions if a bi-directional configuration is used.

(2) The track allocation shall be as follows —

(i) Track 1 – co-pilot headphones and live boom microphone;

- (ii) Track 2 – pilot headphones and live boom microphone ;
 - (iii) Track 3 - Area microphone ;
 - (iv) Track 4 – time reference plus the third and fourth crew members’ headphone and live microphone, if applicable.
 - (e) To preserve the CVR recordings—
 - (1) No person shall turn off a CVR during flight time ;
 - (2) The CVR shall be de-activated upon completion of flight time following an accident or incident ; and
 - (3) Following an accident or incident, the CVR shall not be re-activated before their disposition as determined in accordance with ICAO Annex 13.
 - (f) To facilitate location and identification in case of an accident, the cockpit voice recorder shall—
 - (1) Be either bright orange or bright yellow ;
 - (2) Have reflective tape affixed to the external surface to facilitate its location under water ; and
 - (3) Have an approved underwater locating device on or adjacent to the recorder, which is secured in such a manner that it is not likely to be separated during a crash impact and is automatically activated.
 - (4) Be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.
- 7.8.1.2—(a)** No person may operate the following aircraft unless it is equipped with a flight data recorder capable of recording the aural environment of the flight deck during flight time.
- (1) [AOC] All aeroplanes with a maximum certificated takeoff mass of over 5 700 kg up to and including 27 000 kg shall be equipped with a Type II FDR
 - (2) [AOC] All aeroplanes with a maximum certificated take off mass of more than 27 000 kg shall be equipped with a Type I FDR ;
 - (3) [AOC] All turbine powered aeroplanes with a maximum certificated takeoff mass of less than 5,700 kg shall be equipped with a Type IIA FDR
 - (4) [AAC] All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1989 with a maximum certificated take off mass of more than 27 000 kg shall be equipped with a Type I FDR ;
 - (5) [AAC] All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2005 with a maximum certificated take off mass of more than 5700kg shall be equipped with a Type 1A FDR ;
 - (6) [AOC] All helicopters with a certificated takeoff mass of over 7 000 kg shall have a Type IV FDR.

(7) [AOC] All helicopters with a certificated takeoff mass of over 3 180 kg shall have a Type IVA FDR.

(8) [AAC] All helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 1989 with a certificated takeoff mass of over-7 000 kg shall have a Type IV FDR.

(9) [AAC] All helicopters for which the individual certificate of airworthiness is first issued after 1 January 2005 with a certificated takeoff mass of over 3 180 kg shall have a Type IVA FDR.

(b) [AOC] Flight data recorders shall—

(1) Be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed;

(2) Be calibrated as required by the Authority; and

(3) Have an approved device to assist in locating a recorder that may be under water and can be automatically activated.

(c) Flight data recorders shall be capable of retaining the information recorded during the last—[AAC] All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2005 with a maximum certificated take off mass of more than 5700 kg shall be equipped with a Type IA FDR;

(1) Type I and II – 25 hours of operation.

(2) Type IIA – 30 minutes of operation.

(3) Type IV and V – 10 hours of operation.

(d) See Implementing Standard: IS: 7.1.8.2 for specific flight data recorder requirements.

(e) Flight data recorder media not acceptable for use in aircraft registered in Nigeria, or operated in commercial air transport operations in Nigeria, are—

(1) Engraving metal foil;

(2) Photographic film; or

(3) Analogue data using frequency modulation.

Recording of
Data Link
Communications

7.8.1.3.—(a) All powered aircraft that use data link communications and are required to carry a CVR shall record on a flight recorder all data link communications to and from the aeroplane.

(b) The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.

(c) The recording shall contain sufficient information to derive the content of the data link communications message and, whenever practical, the time the message was displayed to or generated by the crew shall be recorded.

7.9 EMERGENCY, RESCUE, AND SURVIVAL EQUIPMENTEmergency
Equipment:
All Aircraft**7.9.1.1.—(a)** [AAC] Each item of emergency and flotation equipment shall be—

(1) Readily accessible to the crew and, with regard to equipment located in the passenger compartment, to passengers without appreciable time for preparatory procedures;

(2) Clearly identified and clearly marked to indicate its method of operation;

(3) Marked as to date of last inspection; and

(4) Marked as to contents when carried in a compartment or container.

7.9.1.2.—(a) No person shall operate an aeroplane without the following emergency exit equipment:Emergency
Exit
Equipment -
Passengers

(1) [AAC] Each passenger-carrying land plane emergency exit (other than over-the-wing) that is more than 6 feet from the ground with the aeroplane on the ground and the landing gear extended, shall have an approved means to assist the occupants in descending to the ground.

(2) [AAC] Each passenger emergency exit, its means of access, and its means of opening shall be conspicuously marked by a sign visible to occupants approaching along the main passengerEmergency Equipment: All Aircraft aisle.

(3) [AAC] Each passenger-carrying aeroplane shall have an emergency lighting system, independent of the main lighting system that—

(i) Illuminates each passenger exit marking and locating sign;

(ii) Provides enough general lighting in the passenger cabin; and

(iii) [AOC] Includes floor proximity emergency escape path marking.

(4) [AAC] Each passenger emergency exit and the means of opening that exit from the outside shall be marked on the outside of the aeroplane.

(5) [AAC] Each passenger-carrying aeroplane shall be equipped with a slip-resistant escape route that meets the requirements under which that aeroplane was type certified.

(6) Each passenger carrying aeroplane shall meet the detailed requirements contained in IS: 7.9.1.2.

(b) [AAC] No person shall operate a helicopter certificated with a maximum take-off mass of 3175kg or less and nine or less passenger seats without the following emergency exit equipment:

(1) *Number and location.*

(i) There must be at least one emergency exit on each side of the cabin readily accessible to each passenger. One of these exits must be usable in any probable attitude that may result from a crash.

(ii) Doors intended for normal use may also serve as emergency exits, provided that they meet the requirements of this section.

(iii) If emergency flotation devices are installed, there must be an emergency exit accessible to each passenger on each side of the cabin that is shown by test, demonstration, or analysis to—

(a) Be above the waterline; and

(b) Be open without interference from flotation devices, whether stowed or deployed.

(2) *Type and operation.* Each emergency exit prescribed by paragraph (a) of this section must—

(i) Consist of a movable window or panel, or additional external door, providing an

unobstructed opening that will admit a 19-by 26-inch ellipse;

(ii) Have simple and obvious methods of opening, from the inside and from the outside, which do not require exceptional effort;

(iii) Be arranged and marked so as to be readily located and opened even in darkness; and

(iv) Be reasonably protected from jamming by fuselage deformation.

(3) *Ditching emergency exits for passengers.* If certification with ditching provisions is requested, the markings required by (1)(iii) of this paragraph must be designed to remain visible if the rotorcraft is capsized and the cabin is submerged.

(c) [AAC] No person shall operate a helicopter certificated with a maximum take-off mass of more than 9070kg and ten or more passenger seats without the following emergency exit equipment:

(1) *Passenger emergency exits and openings.* Openings with dimensions larger than those specified below may be used, regardless of shape, if the base of the opening has a flat surface of not less than the specified width. For the purpose of this part, the types of passenger emergency exit shall be as follows:

(i) Type I. This type shall have a rectangular opening of not less than 24 inches wide by 48 inches high, with corner radii not greater than one-third the width of the exit, in the passenger area in the side of the fuselage at floor level and as far away as practicable from areas that might become potential fire hazards in a crash.

(ii) Type II. This type is the same as Type I, except that the opening shall be at least 20 inches wide by 44 inches high.

(iii) Type III. This type is the same as Type I, except that—

(a) The opening shall be at least 20 inches wide by 36 inches high; and

(a) The exits need not be at floor level.

(iv) Type IV. This type shall have a rectangular opening of not less than 19 inches wide by 26 inches high, with corner radii not greater than one-third the

width of the exit, in the side of the fuselage with a step-up inside the rotorcraft of not more than 29 inches.

(2) *Passenger emergency exits; side-of-fuselage.* Emergency exits shall be accessible to the passengers and, except as provided in (c)(4) of this paragraph, must be provided in accordance with the following table: Emergency exits for each side of the fuselage

Passenger seating capacity	Emergency exits for each side of the fuselage			
	Type I	Type II	Type III	Type IV
1 through 10				1
11 through 19			1 or	2
20 through 39		1		1
40 through 59	1			1
60 through 79	1		1 or	2

(3) *Passenger emergency exits; other than side-of-fuselage.* In addition to the requirements of item (2) of this paragraph—

(i) There shall be enough openings in the top, bottom, or ends of the fuselage to allow evacuation with the rotorcraft on its side; or

(ii) The probability of the rotorcraft coming to rest on its side in a crash landing must be extremely remote.

(4) *Ditching emergency exits for passengers.* If the helicopter was certificated with ditching provisions, ditching emergency exits shall be provided in accordance with the following:

(i) For rotorcraft that have a passenger seating configuration, excluding pilots seats, of nine seats or less, one exit above the waterline in each side of the rotorcraft, meeting at least the dimensions of a Type IV exit.

(ii) For rotorcraft that have a passenger seating configuration, excluding pilots seats, of 10 seats or more, one exit above the waterline in a side of the rotorcraft meeting at least the dimensions of a Type III exit, for each unit (or part of a unit) of 35 passenger seats, but no less than two such exits in the passenger cabin, with one on each side of the rotorcraft. However, where it has been shown through analysis, ditching demonstrations, or any other tests found necessary, that the evacuation capability of the rotorcraft during ditching is improved by the use of larger exits, or by other means, the passenger seat to exit ratio may be increased.

(iii) Flotation devices, whether stowed or deployed, may not interfere with or obstruct the exits.

(5) *Ramp exits.* One Type I exit only, or one Type II exit only, that is required in the side of the fuselage under paragraph (b) of this section, may be installed instead in the ramp of floor ramp rotorcraft if—

(i) Its installation in the side of the fuselage is impractical; and

(ii) Its installation in the ramp meets emergency exit access requirements in paragraph (g) below.

(d) [AAC] *Emergency exit arrangement.*

(1) Each emergency exit shall consist of a movable door or hatch in the external walls of the fuselage and must provide an unobstructed opening to the outside.

(2) Each emergency exit shall be openable from the inside and from the outside.

(3) The means of opening each emergency exit shall be simple and obvious and may not require exceptional effort.

(4) There shall be means for locking each emergency exit and for preventing opening in flight inadvertently or as a result of mechanical failure.

(5) There shall be means to minimise the probability of the jamming of any emergency exit in a minor crash landing as a result of fuselage deformation under the ultimate inertial forces –

(i) Upward – 1.5g;

(ii) Forward – 4.0g;

(iii) Sideward – 2.0g;

(iv) Downward – 4.0g.

(6) Except as provided in item (8) of this paragraph, each land-based rotorcraft emergency exit must have an approved slide as stated in paragraph (g) of this subsection, or its equivalent, to assist occupants in descending to the ground from each floor level exit and an approved rope, or its equivalent, for all other exits, if the exit threshold is more than 6 feet above the ground—

(i) With the rotorcraft on the ground and with the landing gear extended;

(ii) With one or more legs or part of the landing gear collapsed, broken, or not extended; and

(iii) With the rotorcraft resting on its side, provided this was accomplished during the emergency evacuation test during type certification of the helicopter.

(7) The slide for each passenger emergency exit shall be a self-supporting slide or equivalent, and shall be designed to meet the following requirements:

(i) It shall be automatically deployed, and deployment shall begin during the interval between the time the exit opening means is actuated from inside the

rotorcraft and the time the exit is fully opened. However, each passenger emergency exit which is also a passenger entrance door or a service door shall be provided with means to prevent deployment of the slide when the exit is opened from either the inside or the outside under non-emergency conditions for normal use.

(ii) It shall be automatically erected within 10 seconds after deployment is begun.

(iii) It shall be of such length after full deployment that the lower end is self-supporting on the ground and provides safe evacuation of occupants to the ground after collapse of one or more legs or part of the landing gear.

(iv) It shall have the capability, in 25-knot winds directed from the most critical angle, to deploy and, with the assistance of only one person, to remain usable after full deployment to evacuate occupants safely to the ground.

(v) For helicopters having 30 or fewer passenger seats and having an exit threshold more than 6 feet above the ground, a rope or other assist means may be used in place of the slide specified in item (6) of this paragraph, provided this was accomplished during the emergency evacuation test during type certification of the helicopter.

(8) If a rope, with its attachment, is used for compliance with items(6), (7), or (8) of this paragraph, it shall—

(i) Withstand a 400-pound static load; and

(ii) Attach to the fuselage structure at or above the top of the emergency exit opening, or at another approved location if the stowed rope would reduce the pilot's view in flight.

(e) [AAC] *Emergency exit marking.*

(1) Each passenger emergency exit, its means of access, and its means of opening shall be conspicuously marked for the guidance of occupants using the exits in daylight or in the dark. Such markings shall be designed to remain visible for rotorcraft equipped for overwater flights if the rotorcraft is capsized and the cabin is submerged.

(2) The identity and location of each passenger emergency exit shall be recognizable from a distance equal to the width of the cabin.

(3) The location of each passenger emergency exit shall be indicated by a sign visible to occupants approaching along the main passenger aisle. There shall be a locating sign—

(i) Next to or above the aisle near each floor emergency exit, except that one sign may serve two exits if both exits can be seen readily from that sign; and

(ii) On each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible the sign may be placed at another appropriate location.

(4) Each passenger emergency exit marking and each locating sign shall have white letters 1 inch

high on a red background 2 inches high, be self or electrically illuminated, and have a minimum luminescence (brightness) of at least 160 micro lamberts. The colors may be reversed if this will increase the emergency illumination of the passenger compartment.

(5) The location of each passenger emergency exit operating handle and instructions for opening shall be shown—

(i) For each emergency exit, by a marking on or near the exit that is readable from a distance of 30 inches; and

(ii) For each Type I or Type II emergency exit with a locking mechanism released by rotary motion of the handle, by—

(a) A red arrow, with a shaft at least three-fourths inch wide and a head twice the width of the shaft, extending along at least 70 degrees of arc at a radius approximately equal to three-fourths of the handle length; and

(b) The word “open” in red letters 1 inch high, placed horizontally near the head of the arrow.

(6) Each emergency exit, and its means of opening, shall be marked on the outside of the rotorcraft. In addition, the following apply—

(i) There shall be a 2-inch colored band outlining each passenger emergency exit, except small rotorcraft with a maximum weight of 12,500 pounds or less may have a 2-inch colored band outlining each exit release lever or device of passenger emergency exits which are normally used doors.

(ii) Each outside marking, including the band, shall have color contrast to be readily distinguishable from the surrounding fuselage surface. The contrast shall be such that, if the reflectance of the darker color is 15 percent or less, the reflectance of the lighter color must be at least 45 percent. “Reflectance” is the ratio of the luminous flux reflected by a body to the luminous flux it receives. When the reflectance of the darker color is greater than 15 percent, at least a 30 percent difference between its reflectance and the reflectance of the lighter color must be provided.

(f) [AAC] *Emergency lighting*. The following apply:

(1) A source of light with its power supply independent of the main lighting system shall be installed to—

(i) Illuminate each passenger emergency exit marking and locating sign; and

(ii) Provide enough general lighting in the passenger cabin so that the average illumination, when measured at 40-inch intervals at seat armrest height on the center line of the main passenger aisle, is at least 0.05 foot-candle.

(2) Exterior emergency lighting shall be provided at each emergency exit. The illumination may not be less than 0.05 foot-candle (measured normal to the direction of incident light) for minimum width on the ground surface, with landing gear extended, equal to the width of the emergency exit where an evacuee is likely to make first

contact with the ground outside the cabin. The exterior emergency lighting may be provided by either interior or exterior sources with light intensity measurements made with the emergency exits open.

(3) Each light required by item(1) or (2) of this paragraph shall be operable manually from the cockpit station and from a point in the passenger compartment that is readily accessible. The cockpit control device must have an “on,” “off,” and “armed” position so that when turned on at the cockpit or passenger compartment station or when armed at the cockpit station, the emergency lights will either illuminate or remain illuminated upon interruption of the rotorcraft’s normal electric power.

(4) Any means required to assist the occupants in descending to the ground shall be illuminated so that the erected assist means is visible from the rotorcraft.

(i) The assist means must be provided with an illumination of not less than 0.03 foot-candle (measured normal to the direction of the incident light) at the ground end of the erected assist means where an evacuee using the established escape route would normally make first contact with the ground, with the rotorcraft in each of the attitudes corresponding to the collapse of one or more legs of the landing gear.

(ii) If the emergency lighting subsystem illuminating the assist means is independent of the rotorcraft’s main emergency lighting system, it shall —

- (a) Automatically activate when the assist means is erected ;
- (b) Provide the illumination required by (4) (i) above ; and
- (c) Not be adversely affected by stowage.

(5) The energy supply to each emergency lighting unit shall provide the required level of illumination for at least 10 minutes at the critical ambient conditions after an emergency landing.

(6) If storage batteries are used as the energy supply for the emergency lighting system, they may be recharged from the rotorcraft’s main electrical power system provided the charging circuit is designed to preclude inadvertent battery discharge into charging circuit faults.

(g) [AAC] *Emergency exit access.*

(1) Each passageway between passenger compartments, and each passageway leading to Type I and Type II emergency exits, shall be—

- (i) Unobstructed; and
- (ii) At least 20 inches wide.

(2) For each emergency exit covered by (d)(6) in this paragraph, there shall be enough space adjacent to that exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for that exit.

(3) There shall be access from each aisle to each Type III and Type IV exit, and

(i) For rotorcraft that have a passenger seating configuration, excluding pilot seats, of 20 or more, the projected opening of the exit provided shall not be obstructed by seats, berths, or other protrusions (including seatbacks in any position) for a distance from that exit of not less than the width of the narrowest passenger seat installed on the rotorcraft;

(ii) For rotorcraft that have a passenger seating configuration, excluding pilot seats, of 19 or less, there may be minor obstructions in the region described in (g)(3) (i) of this paragraph, if there are compensating factors to maintain the effectiveness of the exit.

(h) *Main aisle width.* The main passenger aisle width between seats must equal or exceed the values in the following table:

Passenger seating capacity	Minimum main passenger aisle width	
	Less than 25 inches from floor (inches)	25 Inches and more from floor (inches)
10 or less	12	15
11 through 19	12	20
20 or more	15	20

¹A narrower width not less than 9 inches may be approved when substantiated by tests found necessary by the State of Manufacturer.

Visual Signalling Devices.

7.9.1.3—(a) [AAC] No person may operate an aircraft over water or across land areas which have been designated by the Authority as areas in which search and rescue would be especially difficult, unless equipped with such signalling devices as may be appropriate to the area overflown, to include—

- (1) At least one pyrotechnic signalling device for each life raft required for overwater operations ; and
- (2) Any other requirements specified by the Authority

Survival Kits.

7.9.1.4—(a) [AAC] No person may operate an aircraft across land areas which have been designated by Nigeria as areas in which search and rescue would be especially difficult, unless equipped with enough survival kits for the number of occupants of the aeroplane appropriate for the route to be flown.

Emergency Locator Transmitter.

7.9.1.5—(a) No person shall operate an aeroplane without the following emergency locator equipment:

- (1) [AAC] All aeroplanes on all flights shall be equipped with an automatically activated ELT that transmit simultaneously on 121.5 MHz and 406 MHz, and meet the

technical standards specified by the Authority and the relevant portions of ICAO Annex 10, Volume 3.

(2) [AAC] Batteries used in ELTs shall be replaced (or recharged if the battery is rechargeable) when—

- (i) The transmitter has been in use for more than one cumulative hour; or
- (ii) 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired.

(3) [AAC] The date for a replacement of the battery in the ELT shall be legibly marked on the outside of the transmitter.

(4) [AOC] No person may operate an aeroplane in long-range overwater operations or over designated land areas where search and rescue would be especially difficult, without having on the aeroplane at least two ELTs, one of which shall be automatic,

(5) [AOC] At least one survival type ELT shall be located with each life-raft carried as prescribed in Regulation 7.9.1.18.

(b) No person shall operate helicopter without the following emergency locator equipment:

(1) [AAC] All helicopters on all flights shall be equipped with an automatically activated ELT that transmit simultaneously on 121.5 MHz and 406 MHz, and meet the technical standards specified by the Authority and the relevant portions of ICAO Annex 10, Volume 3.

(2) [AAC] Batteries used in ELTs shall be replaced (or recharged if the battery is rechargeable) when—

- (i) The transmitter has been in use for more than one cumulative hour; or
- (ii) 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired.

(3) [AAC] The date for a replacement of the battery in the ELT shall be legibly marked on the outside of the transmitter.

(4) [AAC] No person may operate helicopter in long-range overwater operations or over designated land areas where search and rescue would be especially difficult, without having on the helicopter at least two survival type ELTs, one of which shall be automatic,

(5) [AAC] At least one survival type ELT shall be located with each life-raft carried (See as prescribed in Regulations 7.9.1.18).

7.9.1.6.—(a) [AAC] No person may operate an aircraft unless it is equipped with portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aircraft. At least one shall be located in—

- (1) The pilot's compartment; and

Portable Fire
Extinguishers.

(2) Each passenger compartment that is separate from the pilot's compartment and not readily accessible to the flight crew.

(b) [AOC] No person may operate an aircraft unless it is equipped with portable fire extinguishers accessible for use in crew, passenger, and cargo compartments as follows:

(1) 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.

(2) 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.

(3) At least one portable fire extinguisher shall be conveniently located on the flight deck for use by the flight crew.

(4) 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.

(5) For each aeroplane having a passenger seating capacity of more than 30, there shall be at least the following number of portable fire extinguishers conveniently located and uniformly distributed throughout the compartment.

Minimum Number of Hand Fire Extinguishers Passenger Seating Capacity	
7 through 29	1
30 through 60	2
61 through 200	3
201 through 300	4
301 through 400	5
401 through 500	6
501 through 600	7
601 or more	8

7.9.1.7.—(a) [AOC] No person may operate a passenger-carrying transport category aeroplane unless each lavatory in the aeroplane is equipped with a built-in

Lavatory
Fire
Extinguisher

fire extinguisher for each disposal receptacle for towels, paper, or waste located within the lavatory.

(b) [AOC] Built-in lavatory fire extinguishers shall be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in the receptacle.

7.9.1.8.—(a) [AOC] No person may operate a passenger-carrying transport category aeroplane unless each lavatory in the aeroplane is equipped with a smoke detector system or equivalent that provides—

Lavatory
Smoke
Detector

(1) A warning light in the cockpit; or

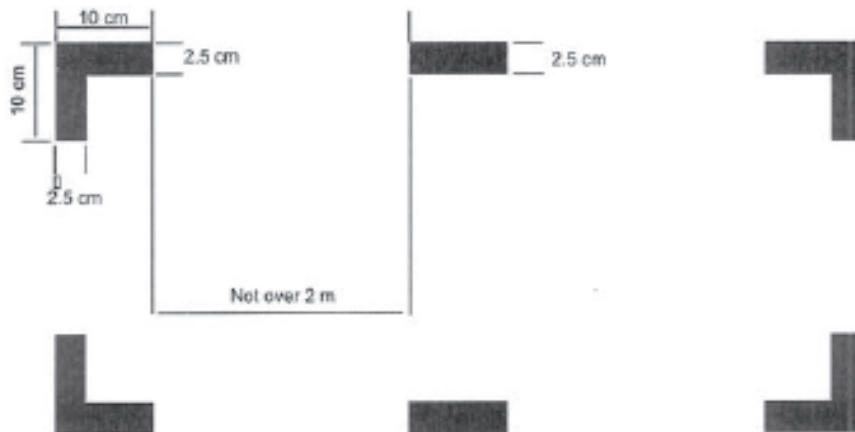
(2) A warning light or audio warning in the passenger cabin which would be readily detected by a cabin crew member, taking into consideration the positioning of cabin crew members throughout the passenger compartment during various phases of flight.

7.9.1.9.—(a) [AAC] No person shall operate an aeroplane certificated with a take-off mass of 5 700 kg or more unless it is equipped with a crash axe appropriate for effective use in that type of aeroplane, stored in a place not visible to passengers on the aeroplane.

Crash Axe

7.9.1.10.—(a) [AAC] If 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, and the colour of the markings shall be red or yellow and, if necessary, they shall be outlined in white to contrast with the background.

Marking of
Break-in
Points



(a) [AAC] If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

First-Aid
Kit and
Universal
Precaution
Kit

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First -Aid
Kit and
Universal
Precaution
Kit.

7.9.1.11.—(a) [AAC] No person may operate an aircraft unless it is equipped with an accessible, approved first-aid kit(s) and universal precaution kit(s).

(b) [AAC] The type, number, location and contents of first-aid kit(s) and universal precaution kit(s) to be carried shall comply with Implementing Standard: IS: 7.9.1.11

Emergency
Medical
Kit
Aeroplanes.

7.9.1.12.—(a) [AOC] No person may operate a passenger flight in an aeroplane with 30 seats or more unless the aeroplane is equipped with an approved emergency medical kit for treatment of injuries or medical emergencies that might occur during flight time or in minor accidents.

(b) [AOC] The location and contents of emergency medical kits to be carried shall comply with Implementing Standard: IS: 7.9.1.12.

Oxygen
Storage and
Dispensing
Apparatus

7.9.1.13.—(a) [AAC] All aircraft intended to be operated at altitudes requiring the use of supplemental oxygen shall be equipped with adequate oxygen storage and dispensing apparatus.

(b) [AAC] The oxygen apparatus, the minimum rate of oxygen flow, and the supply of oxygen shall meet applicable airworthiness standards for type certification in the transport category as specified by the Authority.

(c) [AAC] No person may operate an aircraft at altitudes above 10,000 feet unless it is equipped with oxygen masks, located so as to be within the immediate reach of flightcrew members while at their assigned duty station.

(d) [AAC] No person may operate a pressurised aeroplane at altitudes above 25,000 feet unless:

(1) Flightcrew member oxygen masks are available at the flight duty station and are of a quick donning type;

(2) Sufficient spare outlets and masks and/or sufficient portable oxygen units with masks are distributed evenly throughout the cabin to ensure immediate availability of oxygen to each required cabin crew member regardless of his location at the time of cabin pressurisation failure.

(e) [AAC] An oxygen-dispensing unit connected to oxygen supply terminals is installed so as to be immediately available to each occupant, wherever seated. The total number of dispensing units and outlets shall exceed the number of seats by at least 10%. The extra units are to be evenly distributed throughout the cabin.

(f) [AAC] The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual. See Implementing Standard: IS: 7.9.1.13 to determine the amount of supplemental oxygen needed for non-pressurised and pressurised aircraft.

7.9.1.14.—(a) [AOC] No AOC holder may operate an aeroplane with a maximum certified takeoff mass exceeding 5700 kg, or having a maximum approved seating configuration of more than 19 seats unless—

**Protective
Breathing
Equipment**

(1) It has PBE to protect the eyes, nose and mouth of each flight crew member while on flight deck duty and to provide oxygen for a period of not less than 15 minutes; and

(2) It has sufficient portable PBE to protect the eyes, nose and mouth of all required cabin crew members and to provide breathing gas for a period of not less than 15 minutes.

(b) [AOC] The oxygen supply for PBE may be provided by the required supplemental oxygen system.

(c) [AOC] The PBE intended for flight crew use shall be conveniently located on the flight deck and be easily accessible for immediate use by each required flight crew member at their assigned duty station.

(d) [AOC] The PBE intended for cabin crew use shall be installed adjacent to each required cabin crew member duty station.

(e) [AOC] Easily accessible portable PBE shall be provided and located at or adjacent to the required hand fire extinguishers except that, where the fire extinguisher is located inside a cargo compartment, the PBE shall be stowed outside but adjacent to the entrance to that compartment.

(f) [AOC] The PBE while in use shall not prevent required communication.

7.9.1.15.—(a) [AOC] No AOC holder may conduct a passenger carrying operation in a pressurised aeroplane at altitudes above 25,000 feet, when a cabin crew member is required to be carried, unless it is equipped with—

**First Aid
Oxygen
Dispensing
Units.**

(1) Undiluted first-aid oxygen for passengers who, for physiological reasons, may require oxygen following a cabin depressurisation; and

(2) A sufficient number of dispensing units, but in no case less than two, with a means for cabin crew to use the supply.

(b) [AOC] The amount of first-aid oxygen required in paragraph (a) for a particular operation and route shall be determined on the basis of—

(1) Flight duration after cabin depressurisation at cabin altitudes of more than 8,000 feet;

(2) An average flow rate of at least 3 litres Standard Temperature Pressure Dry (STPD)/minute/person; and

(3) At least 2% of the passengers carried, but in no case for less than one person.

(c) [AOC] The amount of first-aid oxygen required for a particular operation shall be determined on the basis of cabin pressure altitudes and flight duration, consistent with the operating procedures established for each operation and route.

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(d) [AOC] The oxygen equipment provided shall be capable of generating a mass flow to each user of at least four litres per minute, STPD. Means may be provided to decrease the flow to not less than two litres per minutes, STPD, at any altitude.

Megaphones

7.9.1.16.—(a) [AOC] Each person operating a passenger-carrying aeroplane shall have a portable battery-powered megaphone or megaphones readily accessible to the crew members assigned to direct emergency evacuation.

(b) [AOC] The number and location of megaphones required in paragraph (a) shall be determined as follows:

(1) On aeroplanes with a seating capacity of more than 60 and less than 100 passengers, one megaphone shall be located at the most rearward location in the passenger cabin where it would be readily accessible to a normal cabin crew member seat; and

(2) On aeroplanes with a seating capacity of more than 99 passengers, two megaphones in the passenger cabin on each aeroplane one installed at the forward end and the other at the most rearward location where it would be readily accessible to a normal cabin crew member seat.

(3) For aeroplanes with more than one passenger deck, in all cases when the total passenger seating configuration of a deck is more than 60, at least one megaphone is required on the deck.

Individual
Flotation
Devices.

7.9.1.17.—(a) Landplanes.

(1) [AAC] Landplanes shall carry the equipment prescribed in paragraph 2:

(i) When flying en-route over water beyond gliding distance from the shore;

(ii) When flying over water at a distance of more than 93 km (50 NM) away from the shore for aircraft capable of maintaining safe altitude after the failure of one engine for twoengine aircraft and the failure of two engines for three or four-engine aircraft.; or

(iii) When taking off or landing at an aerodrome where the Authority has determined the take off or approach path is so disposed over water that in the event of a mishap there would be the likelihood of a ditching.

(2) [AAC] One life-jacket or equivalent flotation device equipped with a means of electric illumination shall be carried 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) Seaplanes.

(1) [AAC] For all flights, seaplanes shall be equipped with the equipment prescribed in paragraph 2.

7.9.1.18.—(a) [AAC] In addition to the equipment as prescribed in Regulations 7.9.1.17 and as prescribed in Regulations 7.9.1.19 of this Part, life saving rafts in sufficient numbers to carry all persons on board shall be installed in:

(1) Aeroplanes operated on long range over-water flights, and

(2) All other aeroplanes when they are operated over water away from land suitable for making an emergency landing at a distance of more than 185 km (100 NM) in the case of single-engine aeroplanes, and more than 370 km (200 NM) in the case of multi-engine aeroplanes capable of continuing flight with one engine inoperative.

(3) Class 1 and 2 helicopters when they are operated over water at a distance from land corresponding to more than 10 minutes at normal cruise speed.

(4) Class 3 helicopters when they are operated over water beyond autorotational or safe forced landing distance from land.

(b) [AOC] An aircraft shall have life saving rafts with a sufficient capacity to carry all persons on board in the event of the loss of one raft of the largest capacity.

(c) All life saving rafts shall be stowed so as to facilitate their ready use in an emergency.

(d) Life rafts shall be equipped with the following life sustaining equipment—

(1) A electric survivor locator light;

(2) A survival kit;

(3) A pyrotechnic signalling device; and

(4) An ELT (See as prescribed in Regulations 7.9.1.5).

(e) [AOC] In helicopters, life rafts which are not deployable by remote control and which have a mass of more than 40 kg shall be equipped with a means of mechanically assisted deployment.

7.9.1.19.—(a) [AAC] All helicopters flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed in the case of performance Class 1 or 2 helicopters, or flying over water beyond autorotational or safe forced landing distance from land in the case of performance Class 3 helicopters, shall be fitted with a permanent or rapidly deployable means of floatation so as to ensure a safe ditching of the helicopter.

Flotation
Device for
Helicopter
Ditching.

7.10 MISCELLANEOUS SYSTEMS AND EQUIPMENT

7.10.1.1.—(a) [AAC] Each aircraft used in passenger carrying operations shall be equipped with the following seats, safety belts, and shoulder harnesses that meet the airworthiness requirements for type certification of that aircraft:

Seats, Safety
Belts, And
Shoulder
Harnesses.

(1) A seat with safety belt for each person on board over an age of two (2) years; and a restraining belt for each berth on board the aircraft

(2) A safety harness for each flight crewmember seat.

(i) The safety harness for each pilot seat shall incorporate a device, which will automatically restrain the occupant's torso in the event of rapid deceleration.

(ii) The safety harness for each pilot seat, which includes shoulder straps and a seat belt, shall incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls.

(3) A forward or rearward facing (within 15 degrees of the longitudinal axis of the aeroplane) seat equipped with a safety harness for each cabin crew member station in the passenger compartment.

(4) The cabin crew member's seats shall be located near floor level and other emergency exits as required by the Authority for emergency evacuation.

Passenger
And Pilot
Compartment
Doors —
Aeroplanes

7.10.1.2.—(a) [AOC] Pilot compartment door —

(1) No person may operate a passenger carrying aeroplane of a maximum certificated takeoff mass in excess of 45 000 kg or with a passenger seating capacity greater than 60 unless that aircraft is equipped with an approved flight crew compartment door that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorised persons.

(2) No person may operate a passenger carrying aeroplane having a certificated takeoff mass of less than 45 000 kg or with a passenger seating capacity of less than 60 unless that aircraft is equipped with an approved flight crew compartment door, where practicable, that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorised persons.

(3) Each pilot compartment door shall be capable of being locked and unlocked from either pilot's station.

(4) A means shall be provided for monitoring from either pilot station the entire door area outside the pilot compartment to identify persons requesting entry and to detect suspicious behaviour or potential threat.

(b) [AOC] Passenger compartment doors —

(1) Each passenger compartment door shall have:

(i) A means for the crew, in an emergency, to unlock each door that leads to a compartment that is normally accessible to passengers and that can be locked by passengers;

(ii) A placard on each door used to access a required passenger emergency exit, indicating that such door shall be open during takeoff and landing; and

(iii) A means readily available for each crewmember to unlock any door that separates a passenger compartment from another compartment that has emergency exit provisions.

Passenger
Information
Signs

7.10.1.3.—(a) [AOC] No person shall operate a passenger carrying aeroplane with a maximum certificated take-off weight of 5,700 kg (12,500 lbs) or more unless it is equipped with—

(1) At least one passenger information sign (using either letters or symbols) notifying when smoking is prohibited and one sign (using either letters or symbols) notifying when safety belts should be fastened, which shall, when illuminated, be legible to each person seated in the passenger cabin under all probable conditions of cabin illumination;

(2) Signs which notify when safety belts should be fastened and when smoking is prohibited shall be so constructed that the crew can turn them on and off;

(3) A sign or placard affixed to each forward bulkhead and each passenger seat back that reads "Fasten Seat Belt While Seated."

(b) [AAC] Notwithstanding paragraph (a), no person shall operate an aircraft in which all passenger seats are not visible from the flight deck, unless it is equipped with a means of indicating to all passengers and cabin crew when seat belts shall be fastened and when smoking is not allowed.

7.10.1.4.—(a) [AAC] No person shall operate an aircraft unless each compartment used by the crew or passengers meet the following requirements of the State of Design—

Materials For
Cabin
Interiors

(1) Materials must be at least flash resistant;

(2) The wall and ceiling linings and the covering of upholstering, floors and furnishings must be flame resistant;

(3) Each compartment where smoking is to be allowed must be equipped with self-contained ash trays that are completely removable and other compartments must be placarded against smoking; and

(4) Each receptacle for used towels, papers and wastes must be of fire-resistant material and must have a cover or other means of containing possible fires started in the receptacles.

(b) [AAC] For aircraft for which the State of Design has developed new airworthiness requirements for cabin interiors since original type certification, the owner of the aircraft shall ensure that all materials that do not meet current State of Design requirement shall have them replaced upon the first major overhaul of the aircraft cabin or refurbishing of the cabin interior with materials that meet the new requirements.

7.10.1.5.—(a) [AAC] Each cargo compartment shall have ceiling and sidewall liner panels which are constructed of materials which meet the test requirements for flame resistance of cargo compartment liners as prescribed for type certification.

Materials
For Cargo
And Baggage
Compartments.

7.10.1.6.—(a) [AOC] No AOC holder may operate an aeroplane unless it is equipped with—

Power
Supply,
Distribution,
And
Indication
System

(1) A power supply and distribution system that meets the airworthiness requirements for certification of an aeroplane in the transport category, as specified by the Authority, or

(2) A power supply and distribution system that is able to produce and distribute the load for the required instruments and equipment, with use of an auxiliary power supply if any one power source or component of the power distribution system fails.

(3) A means for indicating the adequacy of the power being supplied to required flight instruments.

Protective
circuit
Fuses.

7.10.1.7.—(b) [AOC] Engine-driven sources of energy, when used, shall be redundant.

[AOC] No person may operate an aeroplane in which protective fuses are installed unless there are spare fuses available of appropriate ratings for replacement of those accessible in flight.

Icing
Protection
Equipment

7.10.1.8.—(a) [AAC] No person may 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.

(b) [AAC] No person may 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. Any illumination that is used shall be of a type that will not cause glare or reflection that would handicap crew members in the performance of their duties.

Pitot Heat
And
Indication
Systems.

7.10.1.9.—(a) [AAC] No person may operate an aircraft in instrument flight conditions unless it is equipped with a pitot heat system.

(b) [AOC] No AOC holder may operate an aeroplane equipped with a flight instrument pitot heating system unless the aeroplane is also equipped with an operable pitot heat indication system that complies with the following requirements:

(1) The indication provided shall incorporate an amber light that is in clear view of a flightcrew member. The indication provided shall be designed to alert the flightcrew if either:

(i) The pitot heating system is switched “off,” and

(ii) The pitot heating system is switched “on” and any pitot tube heating element is inoperative, or

(2) An integrated flightcrew alerting system that will notify the crew if the pitot system is malfunctioning.

7.10.1.10.—(a) [AAC] No person may operate an aircraft unless it is equipped with a static pressure system vented to the outside atmospheric pressure so that they will be least affected by airflow variation or moisture or other foreign matter, and installed so as to be airtight except for the vent.

Static
Pressure
System.

(b) [AAC] No person may operate an aircraft in IFR or VFR at night unless it is equipped with a static pressure system vented to the outside atmospheric pressure so that they will be 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.

(c) [AOC] No person may operate an aircraft unless it is equipped with two independent static pressure systems, vented to the outside atmospheric pressure so that they will be least affected by airflow variation or moisture or other foreign matter, and installed so as to be airtight except for the vent.

7.10.1.11.—(a) [AOC] No AOC holder may operate an aeroplane with a maximum certified take-off mass of more than 5700 kg unless it is equipped at each pilot station with a windshield wiper or equivalent means to maintain a clear portion of the windshield during precipitation.

Windshield
Wipers.

7.10.1.12.—(a) [AOC] No person may operate an aeroplane in commercial air transport operations under single pilot IFR or at night unless a chart holder is installed in an easily readable position that can be illuminated for night operations.

Chart
Holder.

7.10.1.13.—[AOC] No person shall operate an aeroplane in commercial air transport operations in an aeroplane intended to be operated above 15000 m (49, 000 ft) unless it is equipped with—

Cosmic
Radiation
Detection
Equipment.

(1) An instrument to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e., the total of ionising and neutron radiation of galactic and solar origin) and the cumulative dose on each flight; or

(2) A system of on-board quarterly radiation sampling acceptable to the Authority as described in IS 7.10.1. 13.

7.10.1.14.—(a) [AAC] All seaplanes for all flights shall be equipped with equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable.

Maritime
Sound
Signalling
Device

7.10.1.15.—(AAC) No person shall operate a seaplane unless it is equipped with—

- (1) One anchor, and
- (2) One sea anchor (drogue).

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NIGERIA CIVIL AVIATION REGULATIONS

**PART 7—IMPLEMENTING STANDARDS
NIGERIA**

For ease of reference, the number assigned to each implementing standard corresponds to its associated regulation. For example, IS: 7.10.1.13 would reflect a standard required in subsection 7.10.1.13.

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Category ii:
instruments
and
equipment
approval and
maintenance
requirements

IS: 7.2.1.6—(a) General. The instruments and equipment required by as prescribed in Regulations 7.2.1.6 shall be approved by the Authority as provided in this implementing standard before being used in Category II operations. Before presenting an aircraft for approval of the instruments and equipment, the applicant must show that since the beginning of the 12th calendar month before the date of submission—

(1) The ILS localizer and glide slope equipment were bench checked according to the manufacturer's instructions and found to meet those standards specified in RTCA Paper 23-63/DO-177 dated March 14, 1963, "Standards Adjustment Criteria for Airborne Localizer and Glideslope Receivers."

(2) The altimeters and the static pressure systems were tested and inspected; and

(3) All other instruments and items of equipment specified in as prescribed in Regulations 7.2.1.6 that are listed in the proposed maintenance program were bench checked and found to meet the manufacturer's specifications.

(b) Flight control guidance system. The authority shall approve all components of the flight control guidance system as installed by the evaluation program specified in paragraph (e) if they have not been approved for Category III operations under applicable type or supplemental type certification procedures. In addition, subsequent changes to make, model, or design of the components must be approved by the Authority under this paragraph. Related systems or devices, such as the autothrottle and computed missed approach guidance system, shall be approved by the Authority in the same manner if they are to be used for Category II operations.

(c) Radio altimeter. A radio altimeter must meet the performance criteria of this paragraph for original approval and after each subsequent alteration.

(1) The radio altimeter shall display to the flight crew clearly and positively the wheel height of the main landing gear above the terrain.

(2) The radio altimeter shall display wheel height above the terrain to an accuracy of ± 5 feet or 5 percent, whichever is greater, under the following conditions:

(i) Pitch angles of zero to $\pm 5^\circ$ about the mean approach attitude.

(ii) Roll angles of zero to 20° in either direction.

(iii) Forward velocities from minimum approach speed up to 200 knots.

(iv) Sink rates from zero to 15 feet per second at altitudes from 100 to 200 feet.

(3) Over level ground, the radio altimeter must track the actual altitude of the aircraft without significant lag or oscillation.

(4) With the aircraft at an altitude of 200 feet or less, any abrupt change in terrain representing no more than 10 percent of the aircraft's altitude must not cause the radio altimeter to unlock, and indicator response to such changes must not exceed 0.1 seconds. In addition, if the system unlocks for greater changes, the radio altimeter must reacquire the signal in less than 1 second.

(5) Systems that contain a push to test feature must test the entire system (with or without an antenna) at a simulated altitude of less than 500 feet.

(6) The system must provide to the flight crew a positive failure warning display any time there is a loss of power or an absence of ground return signals within the designed range of operating altitudes.

(d) Other instruments and equipment. All other instruments and items of equipment required by as prescribed in Regulations 7.2.1.6 shall be capable of performing as necessary for Category II operations. Approval is also required after each subsequent alteration to these instruments and items of equipment.

(e) Evaluation program.

(1) *Application.* Approval by evaluation shall be requested by the applicant as a part of the application for approval of the Category II manual.

(2) *Demonstrations.* Unless otherwise authorised by the Authority, the evaluation program for each aircraft requires the demonstrations specified in this paragraph. At least 50 ILS approaches shall be flown with at least five approaches on each of three different ILS facilities and no more than one half of the total approaches on any one ILS facility. All approaches shall be flown under simulated instrument conditions to a 30 m (100 foot) decision height and 90 percent of the total approaches made shall be successful. A successful approach is one in which—

(i) At the 30 m (100 foot) decision height, the indicated airspeed and heading are satisfactory for a normal flare and landing (speed must be ± 5 knots of programmed airspeed, but may not be less than computed threshold speed if autothrottles are used);

(ii) The aircraft at the 30 m (100 foot) decision height, is positioned so that the cockpit is within, and tracking so as to remain within, the lateral confines of the runway extended;

(iii) Deviation from glide slope after leaving the outer marker does not exceed 50 percent of full-scale deflection as displayed on the ILS indicator;

(iv) No unusual roughness or excessive attitude changes occur after leaving the middle marker; and

(v) In the case of an aircraft equipped with an approach coupler, the aircraft is sufficiently in trim when the approach coupler is disconnected at the decision height to allow for the continuation of a normal approach and landing.

(3) *Records.* During the evaluation program the following information shall be maintained by the applicant for the aircraft with respect to each approach and made available to the Authority upon request:

(i) Each deficiency in airborne instruments and equipment that prevented the initiation of an approach.

(ii) The reasons for discontinuing an approach, including the altitude above the runway at which it was discontinued.

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(iii) Speed control at the 30 m (100 foot) DH if auto throttles are used.

(iv) Trim condition of the aircraft upon disconnecting the auto coupler with respect to continuation to flare and landing.

(v) Position of the aircraft at the middle marker and at the decision height indicated both on a diagram of the basic ILS display and a diagram of the runway extended to the middle marker. Estimated touchdown point shall be indicated on the runway diagram.

(vi) Compatibility of flight director with the auto coupler, if applicable.

(vii) Quality of overall system performance.

(4) *Evaluation.* The Authority shall make a final evaluation of the flight control guidance system upon successful completion of the demonstrations. If no hazardous tendencies have been displayed or are otherwise known to exist, the Authority will approve the system as installed.

(f) Each maintenance program for Category II instruments and equipment shall contain the following:

(1) A list of each instrument and item of equipment specified in as prescribed in Regulations 7. 2.1.6 that is installed in the aircraft and approved for Category II operations, including the make and model of those specified in as prescribed in Regulations 7. 2.1.6 (a)(1).

(2) A schedule that provides for the performance of inspections under subparagraph (5) of this paragraph within 3 calendar months after the date of the previous inspection. The inspection shall be performed by a person authorised by Part 5, except that each alternate inspection may be replaced by a functional flight check. This functional flight check shall be performed by a pilot holding a Category II pilot authorisation for the type aircraft checked.

(3) A schedule that provides for the performance of bench checks for each listed instrument and item of equipment that is specified in as prescribed in Regulations 7.2.1.6 (a)(1) within 12 calendar months after the date of the previous bench check.

(4) A schedule that provides for the performance of a test and inspection of each static pressure system within 12 calendar months after the date of the previous test and inspection.

(5) The procedures for the performance of the periodic inspections and functional flight checks to determine the ability of each listed instrument and item of equipment specified in as prescribed in Regulations 7.2.1.6 (a)(1) to perform as approved for Category II operations including a procedure for recording functional flight checks.

(6) A procedure for assuring that the pilot is informed of all defects in listed instruments and items of equipment.

(7) A procedure for assuring that the condition of each listed instrument and item of equipment upon which maintenance is performed is at least equal to its Category II approval condition before it is returned to service for Category II operations.

(8) A procedure for an entry in the maintenance records that shows the date, airport, and reasons for each discontinued Category II operation because of a malfunction of a listed instrument or item of equipment.

(g) *Bench check.* A bench check required by this section shall comply with this paragraph.

(1) Except as specified in paragraph (g)(2) of this subsection, the bench check shall be performed by a certificated repair station holding one of the following ratings as appropriate to the equipment checked:

- (i) An instrument rating; or
- (ii) An avionics rating.

(2) The bench check shall be performed by a certificated air operator on aircraft identified in its approved specific operating provisions with the approved authorisations to perform maintenance and approve for return to service its own aircraft maintained under a continuous maintenance program under an equivalent system identified in Part 9.

(3) The bench check shall consist of removal of an instrument or item of equipment and performance of the following:

- (i) A visual inspection for cleanliness, impending failure, and the need for lubrication, repair, or replacement of parts;
- (ii) Correction of items found by that visual inspection; and
- (iii) Calibration to at least the manufacturer's specifications unless otherwise specified in the approved Category II manual for the aircraft in which the instrument or item of equipment is installed.

(h) *Extensions.* After the completion of one maintenance cycle of 12 calendar months, the Authority will approve a request to extend the period for checks, tests, and inspections if the applicant shows that the performance of particular equipment justifies the requested extension.

IS: 7.8.1.2—(a) [AOC] Types of flight data recorders.

Flight data
Recorders.

(1) Types I and IA FDRs shall record the parameters required to determine accurately:

- (i) The aeroplane flight path.
- (ii) Speed.
- (iii) Altitude.
- (iv) Engine power.
- (v) Configuration and operation.

(2) The parameters that satisfy the requirements for a Type I FDR are contained in Table A below.

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(3) The parameters that satisfy the requirements for a Type IA FDR are listed below. The number of parameters to be recorded will depend on aeroplane's complexity. The parameters without an asterisk (*) are mandatory parameters that shall be recorded. The parameters designated by an asterisk (*) shall also be recorded if an information data source for an asterisked parameter is used by aeroplane's systems or the flightcrew to operate the aeroplane.

(i) The following parameters satisfy the requirements for flight path and speed:

(A) Pressure altitude.

(B) Indicated or calibrated airspeed.

(C) Air-ground status and each landing gear air-ground sensor when practicable.

(D) Total or outside air temperature.

(E) Heading (primary flight crew reference).

(F) Normal acceleration.

(G) Lateral acceleration.

(H) Longitudinal acceleration (body axis).

(I) Time or relative time count.

(J) Navigation data*: drift angle, wind speed, wind direction, latitude/longitude.

(K) Groundspeed*.

(L) Radio altitude*.

(ii) The following parameters satisfy the requirements for altitude:

(A) Pitch attitude.

(B) Roll attitude.

(C) Yaw or sideslip angle*.

(D) Angle of attack*.

(iii) The following parameters satisfy the requirements for engine power:

(A) Engine thrust power: propulsive thrust/power on each engine, cockpit thrust/power lever position.

(B) Thrust reverse status*.

(C) Engine thrust command*.

(D) Engine thrust target*.

(E) Engine bleed valve position*.

(F) Additional engine parameters*: EPR, N1, indicated vibration level, N2, EGT, TLA, fuel flow, fuel cut-off lever position, N3.

(iv) The following parameters satisfy the requirements for configuration:

(A) Pitch trim surface position.

(B) Flaps*: trailing edge flap position, cockpit control selection.

(C) Slats*: leading edge flap (slat) position, cockpit control selection.

- (D) Landing Gear*: landing gear, gear selector position.
- (E) Yaw trim surface position*.
- (F) Roll trim surface position*.
- (G) Cockpit trim control input position pitch*.
- (H) Cockpit trim control input position roll*.
- (I) Cockpit trim control input position yaw*.
- (J) Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection.
- (K) De-icing and/or anti-icing systems selection*.
- (L) Hydraulic pressure (each system)*.
- (M) Fuel quantity*.
- (N) AC electrical bus status*.
- (O) DC electrical bus status*.
- (P) APU bleed valve position*.
- (Q) Computed centre of gravity*.
- (v) The following parameters satisfy the requirements for operation:
 - (A) Warnings.
 - (B) Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis.
 - (C) Marker beacon passage.
 - (D) Each navigation receiver frequency selection.
 - (E) Manual radio transmission keying and CVR/FDR synchronisation reference.
 - (F) Autopilot/autothrottle/AFCS mode and engagement status*.
 - (G) Selected barometric setting*: pilot first officer (co-pilot).
 - (H) Selected altitude (all pilot selectable modes of operation)*.
 - (I) Selected speed (all pilot selectable modes of operation)*.
 - (J) Selected MACH (all pilot selectable modes of operation)*.
 - (K) Selected vertical speed (all pilot selectable modes of operation)*.
 - (L) Selected heading (all pilot selectable modes of operation)*.
 - (M) Selected flight path (all pilot selectable modes of operation)*; course/DSTRK, path angle.
 - (N) Selected decision height*.
 - (O) EFIS display format*: pilot, first officer (co-pilot).
 - (P) Multi function/engine/alerts display format*.
 - (Q) GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warning, and advisories, on/off switch position.

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- (R) Low pressure warning*: hydraulic pressure, pneumatic pressure.
 - (S) Computer failure*.
 - (T) Loss of cabin pressure*.
 - (U) TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*.
 - (V) Ice detection*.
 - (W) Engine warning each engine vibration*.
 - (X) Engine warning each engine overtemperature*.
 - (Y) Engine warning each engine oil pressure low*.
 - (Z) Engine warning each engine overspeed*.
 - (AA) Wind shear warning*.
 - (BB) Operational stall protection, stick shaker and pusher activation*.
 - (CC) All cockpit flight control forces*: control wheel, control column, rudder pedal cockpit input forces.
 - (DD) Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path.
 - (EE) Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path.
 - (FF) DME 1 and 2 distances*
 - (GG) Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran C, ILS.
 - (HH) Brakes*: left and right brake pressure, left and right brake pedal position.
 - (II) Date*.
 - (JJ) Event marker*.
 - (KK) Head up display in use*.
 - (LL) Para visual display on*.
- (4) Types II and IIA FDRs shall record the parameters specified in paragraph (a) (1) (i) through (iv) of this section, and those parameters required to accurately determine the configuration of lift and drag devices:
- (5) The parameters that satisfy the requirements for a Type II and Type IIA FDR are contained in Table A below.
- (6) Type IV FDRs shall record the parameters required to determine accurately:
- (i) The helicopter flight path .
 - (ii) Speed.
 - (iii) Altitude.
 - (iv) Engine power and operation.
- (7) The parameters that satisfy the requirements for a Type IV FDR are contained in Table B below.

(8) Type IVA FDRs shall record the parameters specified in paragraph (a) (6) of this section, and the parameter required to accurately determine configuration.

(9) The parameters that satisfy the requirements for a Type IVA FDR are listed below. The number of parameters to be recorded will depend on the helicopter's complexity. The parameters without an asterisk (*) are mandatory parameters that shall be recorded. The parameters designated by an asterisk (*) shall also be recorded if an information data source for an asterisked parameter is used by helicopter's systems or the flightcrew to operate the helicopter.

(i) The following parameters satisfy the requirements for flight path and speed:

- (A) Pressure altitude.
- (B) Indicated airspeed.
- (C) Total or outside air temperature.
- (D) Heading (primary flightcrew reference).
- (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*.

(ii) The following parameters satisfy the requirements for attitude:

- (A) Pitch attitude.
- (B) Roll attitude.
- (C) Yaw rate.

(iii) The following parameters satisfy the requirements for engine power:

- (A) Power on each engine: free power turbine speed (Nf), engine torque, engine gas generator speed (Ng), cockpit power control position.
- (B) Rotor: main rotor speed, rotor brake.
- (C) Main gearbox oil pressure*.
- (D) Gearbox oil temperature*, main gearbox oil temperature, tail rotor gearbox oil temperature.
- (E) Engine exhaust gas temperature (T4)*.
- (F) Turbine inlet temperature (TIT)*.

(iv) The following parameters satisfy the requirements for configuration:

- A. Landing gear or gear selector position*.
- B. Fuel quality*.
- C. Ice detector liquid water content*.

(v) The following parameters satisfy the requirements for operation:

- (A) Hydraulics low pressure.
- (B) Warnings.

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(C) Primary flight controls —pilot input and/or control output position: collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor petal, controllable stabilator, hydraulic selection.

(D) Marker beacon passage.

(E) Each navigation receiver frequency selection.

(F) AFCS mode and engagement status*.

(G) Stability augmentation system engagement*.

(H) Indicated sling load force*.

(I) Vertical deviation*: ILS glide path, GNSS approach path.

(J) Horizontal deviation*: ILS localizer, GNSS approach path.

(K) DME 1 and 2 distances*.

(L) Altitude rate*.

(M) Ice detector liquid water content*.

(N) Helicopter health and usage monitor system (HUMUS)*:engine data, chip detectors, track timing, exceedance discretes, broadband average engine vibration.

Type V FDRs shall record the parameters specified in paragraph (a) (6) (i) through (iii) of this section, and the parameter required to accurately determine engine power.

(10) The parameters that satisfy the requirements for a Type V FDR are contained in Table B below.

Table A—Aeroplanes
Parameters for Flight Data Recorders

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Serial number	Parameter	Measurement range	Recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)
1	Time (UTC when available, otherwise elapsed time)	24 hours	4	+/-0.125% per hour
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)
3	Indicated airspeed	95 km/h (50 kt) to max V_{SO} (Note 1) V_{SO} to 1.2 V_{SO} (Note 2)	1	+/-5% +/-3%
4	Heading	360 degrees	1	+/-2%
5	Normal acceleration—	-3 g to +6 g	0.125	+/-1% of maximum range excluding datum error of +/-5%
6	Pitch attitude	+/-75 degrees	1	+/-2 degrees
7	Roll attitude	+/-180 degrees	1	+/-2 degrees
8	Radio transmission keying	On-off (one discrete)	1	
9	Power on each engine (Note 3)	Full range	1 (per engine)	+/-2%
10	Trailing edge flap or cockpit control selection	Full range or each discrete position	2	+/-5% or as pilot's indicator
11	Leading edge flap or cockpit control selection	Full range or each discrete position	2	+/-5% or as pilot's indicator
12	Thrust reverser position	Stowed, in transit, and reverse	1 (per engine)	
13	Ground spoiler/speed brake selection	Full range or each discrete position	1	+/-2% unless higher accuracy uniquely required
14	Outside air temperature	Sensor range	2	+/-2 degrees C
15	Autopilot/auto throttle/AFCS mode and engagement status	A suitable combination of discretely	1	
<i>Note—The preceding 15 parameters satisfy the requirements for a Type II FDR.</i>				
16	Longitudinal acceleration	+/-1 g	0.25	+/-1.5% max range excluding datum error of +/-5%
17	Lateral acceleration	+/-1 g	0.25	+/-1.5% max range excluding datum error of +/-5%
18	Pilot input and/or control surface position—primary controls (pitch, roll, yaw) (Note 4)	Full range	1	+/-2 degrees unless higher accuracy uniquely required
19	Pitch trim position	Full range	1	+/-3% unless higher accuracy uniquely required

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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)
21	Glide path deviation	Signal range	1	+/-3%
22	Localizer deviation	Signal range	1	+/-3%
23	Marker beacon passage	Discrete	1	
24	Master warning	Discrete	1	
25	NAV 1 and 2 frequency selection (Note 5)	Full range	4	As installed
26	DME 1 and 2 distance (Notes 5 and 6)	0 – 370 km	4	As installed
27	Landing gear squat switch status	Discrete	1	
28	GPWS (ground proximity warning system)	Discrete	1	
29	Angle of attack	Full range	0.5	As installed
30	Hydraulics, each system (low pressure)	Discrete	2	
31	Navigation data (latitude/longitude, ground speed and drift angle) (Note 7)	As installed	1	As installed
32	Landing gear or gear selector position	Discrete	4	As installed

Note—The preceding 32 parameters satisfy the requirements for a Type I FDR.

Notes—

1. V_{SO} , stalling speed or minimum steady flight speed in the landing configuration.
2. V_D , design diving speed.
3. Record sufficient inputs to determine power.
4. For aeroplanes with conventional control systems "or" applies. For aeroplanes with non-mechanical control systems "and" applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface 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.

If further recording capacity is available, recording of the following additional information should 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:
 - 1) parameters selected by the flightcrew 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;
 - 2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, ETC.;
 - 3) warnings and alerts;
 - 4) 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; and
- c) additional engine parameters (EPR, N1, EGT, fuel flow, etc.).

Parameters for Flight Data Recorders

Serial number	Parameter	Measurement range	Recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)
1	Time (UTC when available, otherwise elapsed time)	24 hours	4	+/-0.125% per hour
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]
3	Indicated airspeed	As the installed measuring system	1	+/-3%
4	Heading	360 degrees	1	+/-2 degrees
5	Normal acceleration—	-3 g to +6 g	0.125	+/-1%
6	Pitch attitude	+/-75 degrees	0.5	+/-2 degrees
7	Roll attitude	+/-180 degrees	0.5	+/-2 degrees
8	Radio transmission keying	On-off (one discrete)	1	
9	Power on each engine (Note 1)	Full range	1 (per engine)	+/-2%
10	Main rotor speed	50-130%	0.5	+/-2%
11	Pilot input and/or control surface position—primary controls (Collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) (Note 2)	Full range	1	+/-2% unless higher accuracy uniquely required.
12	Hydraulics, each system (low pressure)	Discrete	2	
13	Outside air temperature	Sensor range	2	+/-2 degrees C
14	Autopilot/auto throttle/AFCS mode and engagement status	A suitable combination of discretes	1	
15	Stability augmentation system engagement	Discrete	1	
<i>Note: The preceding 15 parameters satisfy the requirements for a Type V FDR.</i>				
16	Main gearbox oil pressure	As installed	1	As installed
17	Main gearbox oil temperature	As installed	2	As installed
18	Yaw acceleration (or yaw rate)	+/-1 g	0.25	+/-1.5% max range excluding datum error of +/-5%
19	Slings load force	0-200% of certified load	0.5	+/-3% of max range
20	Longitudinal acceleration	+/-1 g	0.25	+/-1.5% max range excluding datum error of +/-5%
21	Lateral acceleration	+/-1 g	0.25	+/-1.5% max range excluding datum error of +/-5%
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)
23	Slide path deviation	Signal range	1	+/-3%
24	Localizer deviation	Signal range	1	+/-3%
25	Marker beacon passage	Discrete	1	

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26	Master warning	Discrete	1	
27	NAV 1 and 2 frequency selection (Note 3)	Full range	4	As installed
28	DME 1 and 2 distance (Notes 3 and 4)	0-370 km	4	As installed
29	Navigation data (latitude/longitude, ground speed) (Note 5)	As installed	2	As installed
30	Landing gear or gear selector position	Discrete	4	As installed

Note: The preceding 30 parameters satisfy the requirements for a Type IV FDR.

Notes—

1. Record sufficient inputs to determine power.
 2. For helicopters with conventional control systems "or" applies. For helicopters with non-mechanical control systems "and" applies.
 3. If signal available in digital form.
 4. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.
 5. If signals readily available.
- If further recording capacity is available, recording of the following additional information should 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:
 - 1) parameters selected by the flightcrew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and auto-flight system engagement and mode indicators if not recorded from another source;
 - 2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, etc.;
 - 3) warnings and alerts data; and
 - 4) the identity of displayed pages for emergency procedures and checklists; and
 - b) additional engine parameters (EPR, NH, EGT, fuel flow, etc.).

IS: 7.9.1.2—(a) The emergency exit equipment for aeroplanes in 7.9.1.2(a) shall meet the following requirements.

(1) The assisting means for a floor level emergency exit shall meet the requirements under which the aeroplane was type certified.

(2) The location of each passenger emergency exit shall be—

(i) Recognisable from a distance equal to the width of the cabin.

(ii) Indicated by a sign visible to occupants approaching along the main passenger aisle.

(3) There shall be an emergency exit locating sign—

(i) Above the aisle near each over-the-wing passenger emergency exit, or at another ceiling location if it is more practical because of low headroom;

(ii) Next to each floor level passenger emergency exit, except that one sign may serve two such exits if they both can be seen readily from that sign; and

(iii) On each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible, the sign may be placed at another appropriate location.

(4) Each passenger emergency exit marking and each locating sign shall be manufactured to meet the interior emergency exit marking requirements under which the aeroplane was type certified, unless the Authority cites different requirements for compliance with this paragraph.

(5) Note: No sign may continue to be used if its luminescence (brightness) decreases to below 250 micro lamberts.

(6) Sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency light system is independent of the power supply to the main lighting system.

(7) The emergency lighting system shall provide enough general lighting in the passenger cabin so that the average illumination, when measured at 40-inch intervals at seat armrest height, on the centerline of the main passenger aisle, is at least 0.05 foot-candles.

(8) Each emergency light shall—

(i) Be operable manually both from the flightcrew station and from a point in the passenger compartment that is readily accessible to a normal cabin crew member seat;

(ii) Have a means to prevent inadvertent operation of the manual controls; and

(iii) When armed or turned on at either station, remain lighted or become lighted upon interruption of the aeroplane's normal electric power.

(iv) Provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing.

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(v) Have a cockpit control device that has an “on”, “off”, and “armed” position.

(9) The location of each passenger emergency exit operating handle and instructions for opening the exit shall be shown in accordance with the requirements under which the aeroplane was type certified, unless the Authority cites different requirements for compliance with this paragraph.

(10) No operating handle or operating handle cover may continue to be used if its luminescence (brightness) decreases to below 100 micro lamberts.

(11) Access to emergency exits shall be provided as follows for each passenger carrying aeroplane:

(i) Each passageway between individual passenger areas, or leading to a Type I or Type II emergency exit, shall be unobstructed and at least 20 inches wide.

(ii) There shall be enough space next to each Type I or Type II emergency exit to allow a crew member to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required in paragraph (j)1. of this section.

(iii) There shall be access from the main aisle to each Type III and Type IV exit. The access from the aisle to these exits shall not be obstructed by seats, berths, or other protrusions in a manner that would reduce the effectiveness of the exit. In addition, the access shall meet the emergency exit access requirements under which the aeroplane was type certificated, unless the Authority cites different requirements for compliance with this paragraph.

(iv) If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in the passenger cabin, the passageway shall not be obstructed. However, curtains may be used if they allow free entry through the passageway.

(v) No door may be installed in any partition between passenger compartments.

(vi) If it is necessary to pass through a doorway separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door shall have a means to latch it in open position, and the door shall be latched open during each takeoff and landing. The latching means shall be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, prescribed in the airworthiness standards for type certification in the transport category as cited by the Authority.

(12) Each passenger emergency exit and the means of opening that exit from the outside shall be marked on the outside of the aeroplane with a 2-inch coloured band outlining the exit on the side of the fuselage.

(13) Each passenger emergency exit marking, including the band, shall be readily distinguishable from the surrounding fuselage area by contrast in colour and shall comply with the following:

(i) If the reflectance of the darker colour is 15 percent or less, the reflectance of the lighter colour shall be at least 45 percent.

(ii) If the reflectance of the darker colour is greater than 15 percent, at least a 30 percent difference between its reflectance and the reflectance of the lighter colour shall be provided.

(iii) Note: “Reflectance” is the ratio of the luminous flux reflected by a body to the luminous flux it receives.

(iv) Exits that are not in the side of the fuselage shall have external means of opening and applicable instructions marked conspicuously in red or, if red is inconspicuous against the background colour, in bright chrome yellow and, when the opening means for such an exit is located on only one side of the fuselage, a conspicuous marking to that effect shall be provided on the other side.

(14) Each passenger-carrying aeroplane shall be equipped with exterior lighting that meets the requirements under which that aeroplane was type certificated, unless the Authority cites different requirement for compliance with this paragraph.

(15) Each passenger-carrying aeroplane shall be equipped with a slip-resistant escape route that meets the requirements under which that aeroplane was type certificated, unless the Authority cites different requirements for compliance with this paragraph.

(16) Each floor level door or exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 or more inches high and 20 or more inches wide, but not wider than 46 inches, each passenger ventral exit and each tail cone exit, shall meet the requirements of this section for floor level emergency exits.

(17) Note: The Authority may grant a deviation from this paragraph if it finds that circumstances make full compliance impractical and that an acceptable level of safety has been achieved.

(18) Approved emergency exits in the passenger compartments that are in excess of the minimum number of required emergency exits shall meet all of the applicable provisions of this subsection section and shall be readily accessible.

(19) On each large passenger-carrying aeroplane with a ventral exit and tail cone exit shall be—

- (i) Designed and constructed so that it cannot be opened during flight; and
- (ii) Marked with a placard readable from a distance of 30 inches and installed at a conspicuous location near the means of opening the exit, stating that the exit has been designed and constructed so that it cannot be opened during flight.

(20) Portable lights. No person may operate a passenger carrying aeroplane unless it is equipped with flight stowage provisions accessible from each cabin crew member seat.

IS: 7.9.1.11—(a) [AAC] Types. One type of first-aid kit and universal precaution kit shall be provided for carriage in all aircraft.

First- aid
kits and
universal
precaution
kits

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(b) [AOC] Contents. The required first-aid kits shall include at least the following:

- (1) Antiseptic swabs (10/pack).
- (2) Bandage: adhesive strips
- (3) Bandage: gauze 7.5cm × 4.4m.
- (4) Bandage: triangular 100cm folded and safety pins.
- (5) Dressing: burn 10cm × 10cm.
- (6) Dressing: compress, sterile 7.5cm × 12cm.
- (7) Dressing: gauze, sterile 10.4cm × 10.4cm.
- (8) Tape: adhesive 2,5 cm (roll).
- (9) Steri-strips (or equivalent adhesive strip).
- (10) Hand cleanser or cleansing towelettes.
- (11) Pad with shield, or tape, for eye.
- (12) Scissors: 10cm .
- (13) Tape: Adhesive, surgical 1.2cm × 4.6m
- (14) Tweezers: splinter.
- (15) Disposable gloves (pair).
- (16) Thermometers (non-mercury)
- (17) Mouth to mouth resuscitation mask with one-way valve.
- (18) First-aid manual, current edition.
- (19) Incident record form.
- (20) Mild to moderate analgesic
- (21) Antiemetic
- (22) Nasal decongestant.
- (23) Antacid.
- (24) Antihistamine

(c) [AOC] Contents. The required universal precaution kit shall include at least the following:

- (1) Dry powder that can covert small liquid spill into a sterile granulated gel
- (2) Germicidal disinfectant for surface cleaning
- (3) Skin wipes
- (4) Face/eye mask (separate or combined)
- (5) Gloves (disposable).
- (6) Protective apron.
- (7) Large absorbent towel.
- (8) Pick-up scoop with scraper
- (9) Bio-hazard disposal waste bag.
- (10) Instructions.

(d)—(1) [AOC] Number of first-aid kits. Each aircraft shall carry first-aid kits in accordance with the following schedule.

Number Of Passenger Seats	Number Of First-Aid Kits
0 – 100	1
101 – 200	2
201 – 300	3
301 – 400	4
401 – 500	5
More than 500	6

(2) Universal Precaution Kits For routine operations, one or two universal precaution kits should be carried on aircraft that are required to operate with at least one cabin crew member. Additional kit(s) should be made available at times of increased public health risk, such as an outbreak of a serious communicable disease having pandemic potential. Such kits may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to protect the cabin crew who are assisting potentially infectious cases of suspected communicable diseases

(e) [AOC] Location.

(1) The required first-aid kits and universal precaution kits should be distributed evenly throughout the aircraft, and shall be readily accessible to cabin crew members, if cabin crew members are required for the flight; and

(2) The first-aid kits and universal precaution kits shall be located near the aircraft exits should their use be required outside the aircraft in an emergency situation.

IS: 7.9.1.12—(a)[AOC]=The required medical kit shall include the following equipment:

Emergency
Medical kit -
Aeroplanes.

- (1) List of contents.
- (2) Stethoscope.
- (3) Sphygmomanometer (electronic preferred).
- (4) Airways oropharyngeal (3 sizes).
- (5) Syringes (appropriate range of sizes).
- (6) Needles (appropriate range of sizes).
- (7) Intravenous catheters (appropriate range of sizes)..
- (8) Antiseptic Wipes.
- (9) Gloves.
- (10) Needle disposal box
- (11) Urinary catheter

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- (12) System for delivering intravenous fluids
- (13) Venous tourniquet.
- (14) Sponge gauze
- (15) Tape – adhesive.
- (16) Surgical mask.
- (17) Emergency tracheal catheter (or large gauge intravenous cannula)
- (18) Umbilical cord clamp
- (19) Thermometers (non-mercury)
- (20) Basic life support cards
- (21) Bag-valve mask
- (22) Flashlight and batteries
- (b) [AOC] The required medical kit shall include the following medication:
 - (1) Epinephrine 1:1000.
 - (2) Antihistamine - injectable.
 - (3) Dextrose 50% (or equivalent) – injectable: 50ml.
 - (4) Antiemetic - injectable.
 - (5) Bronchial dilator - inhaler.
 - (6) Atropine – injectable.
 - (7) Adrenocortical steroid – injectable.
 - (8) Diuretic – injectable..
 - (9) Medication for postpartum bleeding.
 - (10) Sodium Chloride 0.9% (minimum 250ml)
 - (11) Acetyl salicylic acid (aspirin) for oral use.
 - (12) Oral beta blocker.
- (c) [AOC] The medical kit shall be stored in a secure location.

Oxygen
Storage and
Dispensing
Apparatus

IS: 7.9.1.13—(a)The supplemental oxygen supply requirements for non-pressurised aeroplanes are as follows:

(1) An operator shall not operate a non-pressurised aeroplane at pressure altitudes above 10 000 ft unless supplemental oxygen equipment, capable of storing and dispensing the oxygen supplies required, is provided.

(2) The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration,

consistent with the operating procedures, established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.

(3) An aeroplane intended to be operated above 10 000 ft pressure altitude shall be provided with equipment capable of storing and dispensing the oxygen supplies required.

(4) Oxygen supply requirements.

(i) Flightcrew members. Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Table 1. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crew members on flight deck duty for the purpose of oxygen supply.

(ii) Cabin crew members, additional crew members and passengers. Cabin crew members and passengers shall be supplied with oxygen in accordance with Table 1. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.

<i>(a)</i>	<i>(b)</i>
SUPPLY FOR:	DURATION AND PRESSURE ALTITUDE
1. All occupants of flight deck seats on deck duty	Entire flight time at pressure flight attitudes above 10,000 feet
2. All required cabin crew members	Entire flight time at pressure attitudes above 13,000ft and for any period exceeding 30 minutes at pressure attitudes above 10,000ft but not exceeding 13,000ft
3. 100% of passengers (see note)	Entire flight time at pressure attitudes above 13,000ft
4. 10% of passengers (see note)	Entire flight time at pressure attitudes greater than 10,000ft but not exceeding 13,000ft

(b) The supplemental oxygen supply requirements for pressurised aeroplanes are as follows:

(1) An operator shall not operate a pressurised aeroplane at pressure altitudes above 10 000 ft unless supplemental oxygen equipment, capable of storing and dispensing the oxygen supplies required by this paragraph, is provided.

(2) The amount of supplemental oxygen required shall be determined on the basis of cabin pressure altitude, flight duration and the assumption that a cabin pressurisation failure will occur at the altitude or point of flight that is most critical from the standpoint of oxygen need, and that, after the failure, the aeroplane will descend in accordance with emergency procedures specified in the Aeroplane Flight

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Manual to a safe altitude for the route to be flown that will allow continued safe flight and landing.

(3) Following a cabin pressurisation failure, the cabin pressure altitude shall be considered the same as the aeroplane pressure altitude, unless it is demonstrated to the Authority that no probable failure of the cabin or pressurisation system will result in a cabin pressure altitude equal to the aeroplane pressure altitude. Under these circumstances, the demonstrated maximum cabin pressure altitude may be used as a basis for determination of oxygen supply.

4 Oxygen equipment and supply requirements.

(1) Flight crew members.

(A) Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Table 2. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crew members on flight deck duty for the purpose of oxygen supply.

(B) Flight deck seat occupants, not supplied by the flight crew source, are to be considered as passengers for the purpose of oxygen supply.

(C) Oxygen masks shall be located so as to be within the immediate reach of flight crew members whilst at their assigned duty station.

(D) Oxygen masks for use by flight crew members in pressurised aeroplanes operating at pressure altitudes above 25 000 ft, shall be a quick donning type mask.

(ii) Cabin crew members, additional crew members, and passengers.

(A) Cabin crew members and passengers shall be supplied with supplemental oxygen in accordance with Table 2. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.

(B) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft shall be provided sufficient spare outlets and masks and/or sufficient portable oxygen units with masks for use by all required cabin crew members. The spare outlets and/or portable oxygen units are to be distributed evenly throughout the cabin to ensure immediate availability of oxygen to each required cabin crew member regardless of his location at the time of cabin pressurisation failure.

(C) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft shall be provided an oxygen dispensing unit connected to oxygen supply terminals immediately available to each occupant, whenever seated. The total number of dispensing units and outlets shall exceed the number of seats by at least 10 percent. The extra units shall be evenly distributed throughout the cabin.

(D) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft or which, if operated at or below 25 000 ft, cannot descend safely within four minutes to 13 000 ft, and for which the individual certificate of airworthiness was first

issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment immediately available to each occupant, wherever seated. The total number dispensing units and outlets shall exceed the number of seats by at least 10 percent. The extra units shall be evenly distributed throughout the cabin.

(E) The oxygen supply requirements, as specified in Table 2, for aeroplanes not certificated to fly at altitudes above 25,000 ft, may be reduced to the entire flight time between 10,000 ft and 13,000 ft cabin pressure altitudes for all required cabin crew members and for at least 10% of the passengers if, at all points along the route to be flown, the aeroplane is able to descend safely within 4 minutes to a cabin pressure altitude of 13,000 ft

Table 2. Requiring for Supplemental Oxygen-Pressurised Aeroplane During and Following Emergency Descent (Note)

SUPPLY FOR:	DURATION AND CABIN PRESSURE ALTITUDE
1. All occupants of flight deck seats on flight deck duty	Entire flight time when the cabin pressure altitude exceeds 13,000 and entire time when the cabin pressure altitude exceeds 10,000ft but does not exceed 13,000ft after the first 30 minutes at those altitudes, but in no case less than: (i) 30 minutes for aeroplanes certificated to fly at altitudes more than 25,000ft (note 3)
2. All required cabin crew members	Entire flight time when cabin pressure altitude exceeds 13,000ft but not less than 30 minutes (Note) 2, and entire flight time when when cabin pressure altitude is greater than 10,000ft but does not exceed 13,000ft after the first 30 minutes at these altitudes.
3. 100% of passengers	10 minutes or the entire flight time when the cabin pressure altitude exceeds 13,000ft whichever is the greater (Note 4)
4. 10% of passengers	Entire flight time when the cabin pressure altitude exceeds 10,000ft but does not exceed 13,000ft after the first 30 minutes at these altitudes.

(c) The supplemental oxygen supply requirements for non-pressurised helicopters are as follows:

(1) An operator shall not operate a non-pressurised helicopter at pressure altitudes above 10 000 ft unless supplemental oxygen equipment, capable of storing and dispensing the oxygen supplies required, is provided.

(2) The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration , consistent with the operating procedures, established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.

A helicopter intended to be operated above 10 000 ft pressure altitude shall be provided with equipment capable of storing and dispensing the oxygen supplies required.

(4) *Oxygen supply requirements:*

(i) Flight crew members. Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Table 3. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crew members on flight deck duty for the purpose of oxygen supply.

(ii) Cabin crew members, additional crew members and passengers. Cabin crew members and passengers shall be supplied with oxygen in accordance with Table 3. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.

Table 3- Supplemental Oxygen for Non-Pressurised Helicopters	
<i>(a)</i>	<i>(b)</i>
SUPPLY FOR:	DURATION AND PRESSURE ALTITUDE
1. All occupants of flight deck seats on deck duty	Entire flight time at pressure flight attitudes above 10,000 feet
2. All required cabin crew members	Entire flight time at pressure attitudes above 13,000ft and for any period exceeding 30 minutes at pressure attitudes above 10,000ft but not exceeding 13,000ft
3. 100% of passengers (see note)	Entire flight time at pressure attitudes above 13,000ft
4. 10% of passengers (see note)	Entire flight time at pressure attitudes greater than 10,000ft but not exceeding 13,000ft

Cosmic
Radiation
Detection
Equipment.

IS: 7.10.1.13—(a) Compliance with the sampling requirements in 7.10.1.13 (a)(2) may be accomplished as follows:

(1) The sampling shall be carried out in conjunction with a Radiological Agency or similar organisation acceptable to the Authority.

(2) Sixteen route sectors, which include flight above 15 000 m (49 000 ft), shall be sampled every quarter (three months). Where less than sixteen route sectors which include flight above 15 000 m (49 000 ft) are achieved each quarter, then all sectors above 15 000 m (49 000 ft) shall be sampled.

(3) The cosmic radiation recorded should include both the neutron and non-neutron components of the radiation field.

(4) The results of the sampling, including a cumulative summary quarter on quarter, should be reported to the Authority under arrangements acceptable to the Authority.

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