

CIVIL AVIATION REGULATIONS

SURINAME

PART 7 - INSTRUMENTS AND EQUIPMENT

VERSION 4.0

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Part 7 of these Civil Aviation Regulations Suriname (CARS) presents standards and recommended practices as regulatory requirements for instruments and equipment on aircraft expected to operate in Suriname. As with the other Parts of these CARS, Part 7 presents the standards and recommended practices in ICAO Annex 6 supplemented by sections from the United States Federal Aviation Regulations (FAR) and/or the European Joint Aviation Regulations (JAR). Supplementation by FAR or JAR regulations allows for more efficient implementation of the basic ICAO standards and recommended practices, based upon the experience gained by the FAA and the JAA.

The requirements in Part 7 address three categories of aircraft 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 in the Commercial Air Transport [CAT] and AOC Holder [AOC] categories unless other, more specific regulations supplant the [AAC] requirement. 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 corporate aircraft, that may have performance and range capabilities matching the type of aircraft operated by commercial air transport entities or AOC holders. Similarly, some equipment specified for [CAT] or [AOC] aircraft have sections keyed as [AAC]. In such instances, if a non- [CAT] or [AOC] aircraft is fitted with such equipment, the equipment characteristics must comply with the applicable sections designated [AAC].

The key [CAT] addresses those aircraft operated commercially, that is, for compensation or hire, within Suriname or into or from Suriname. [CAT] requirements will apply to [AOC] aircraft unless a section designated as [AOC] supplies a more specific requirement.

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

As in other Parts of these CARS, operators of aircraft operated in Suriname but registered in another Contracting State must notify the Authority in Suriname when alterations, major repairs or major alterations are made to the aircraft. Suriname may have unique territorial or geographic features that may affect the operation of aircraft, and must be kept informed of the condition of aircraft operated within its borders. Part 7 includes survival equipment requirements that apply to Suriname. The Authority continually reviews geographic areas within Suriname, and designates those areas (AIP) requiring specific types or survival equipment.

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7.1.1 General

7.1.1.1 APPLICABILITY

- (a) Part 7 prescribes the minimum instrument and equipment requirements for all aircraft in all operations.
- (b) Part 7 requirements use the following key designators—
 - (1) AAC: all aircraft, including Commercial Air Transport and AOC Holders appropriate to the subject of the regulations, e.g., an all aircraft regulation may only refer to seaplanes, but will include CAT and AOC seaplanes;
 - (2) CAT: commercial air transport (includes AOC Holders), appropriate to the subject of the regulations, e.g., a CAT regulation may only refer to seaplanes, but will include AOC seaplanes; and
 - (3) AOC: AOC Holders. Where AOC requirements are redundant to AAC or CAT requirements, or more detailed, the AOC requirements will be followed.

7.1.1.2 DEFINITION

1. **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.
2. **Suitable Aerodrome.** A suitable aerodrome is an adequate aerodrome which at the time of the particular type of operation has the weather- and field conditions for which there is a high assurance that an approach and landing can be safely completed with an engine and/or system(s) inoperative.
3. **Adequate Aerodrome.** An adequate aerodrome is one which has the capabilities, services and facilities to accommodate the type of operation carried out.

7.1.1.3 ABBREVIATIONS

- (a) The following acronyms are used in Part 7:
 - (1) ADF – Automatic Direction Finder
 - (2) AOC - Air Operator Certificate
 - (3) DA – Decision Altitude
 - (4) DH – Decision Height
 - (5) DME – Distance Measuring Equipment
 - (6) ELT – Emergency Locator Transmitter
 - (7) ILS – Instrument Landing System
 - (8) IFR – Instrument Flight Rules
 - (9) IMC - Instrument Meteorological Conditions
 - (10) LRNS - Long Range Navigation Systems
 - (11) MEL – Minimum Equipment List
 - (12) MHz - Megahertz
 - (13) MLS – Microwave Landing System
 - (14) MNPS - Minimum Navigation Performance Specifications
 - (15) NDB – Non-Directional Beacon
 - (16) PBE - Protective Breathing Equipment
 - (17) RVSM – Reduced Vertical Separation Minimum
 - (18) SSR – Secondary Surveillance Radar
 - (19) VFR – Visual Flight Rules
 - (20) VMC - Visual Meteorological Conditions
 - (21) VOR – VHF Omnidirectional Radorange
 - (22) VSM – Vertical Separation Minimum

7.1.1.4 GENERAL INSTRUMENT AND EQUIPMENT REQUIREMENTS

- (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 Part 7 shall be installed or carried, as appropriate, in aircraft according to the aircraft used 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 Suriname of any aircraft not registered in Suriname 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 Suriname but not installed in the aircraft are properly installed and inspected in accordance with the requirements of the State of Registry.
- (d) [AOC] An AOC holder shall ensure that a flight does not commence unless the required equipment—
 - (1) Meets the minimum performance standard and the 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; and
 - (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 crewmember 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.

7.1.2 *Flight and Navigational Instruments*

7.1.2.1 GENERAL REQUIREMENTS

- (a) [AAC] All aircraft shall be equipped with flight and navigational instruments which will enable the flight crew to—
 - (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.
 - (4) Operate the aeroplane with the remaining navigation equipment in accordance with its operational flight plan and the requirements of ATS, in the event of the failure of one item of equipment at any stage of the flight.
- (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 flight crew member shall be so arranged as to permit the flight crew member to see the indications readily from his or her station, with the minimum practicable deviation from the position and line of vision which he or she normally assumes when looking forward along the flight path

7.1.2.2 MINIMUM FLIGHT AND NAVIGATIONAL INSTRUMENTS

- (a) [AAC] No person may operate any aircraft unless it is equipped with the following flight and navigational instruments:
 - (1) An airspeed indicator system calibrated in knots.

- (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.
- (3) An accurate timepiece indicating the time in hours minutes and seconds (approval not required).
- (4) A magnetic compass.

7.1.2.3 INSTRUMENTS FOR OPERATIONS REQUIRING TWO PILOTS

- (a) [AAC] Whenever two pilots are required, each pilot's station shall have separate flight instruments as follows:
 - (1) An airspeed indicator calibrated in knots;
 - (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;
 - (3) A rate-of-climb and descent indicator;
 - (4) A turn and slip indicator, or a turn co-ordinator incorporating a slip indicator;
 - (5) An attitude indicator (artificial horizon); and
 - (6) A stabilised heading indicator (directional gyroscope).

7.1.2.4 IFR INSTRUMENTS AND NAVIGATIONAL EQUIPMENT

- (a) [AAC] 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) 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;
 - (4) An attitude indicator (artificial horizon);
 - (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 flight crew compartment the outside air temperature;
 - (8) A rate-of-climb and descent indicator; and
 - (9) 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, but not less than:
 - (1) One VOR receiving system, one ADF system, one DME and one Marker Beacon receiving system;
 - (2) One ILS or MLS where ILS or MLS is required for approach navigation purposes;
 - (3) An Area Navigation System when area navigation is required for the route being a flown;
 - (4) An additional VOR receiving system on any route, or part thereof, where navigation is based only on VOR signals; and
 - (5) An additional ADF system on any route, or part thereof, where navigation is based only on NDB signals.
- (c) [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.
- (d) [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.

7.1.2.5 STANDBY ATTITUDE INDICATOR

- (a) [AAC] No person may operate an aeroplane with a maximum certified take-off mass exceeding 5,700 kg unless it is equipped with a single standby attitude indicator (artificial horizon) that—
 - (1) Operates independently of any other attitude indicating system;
 - (2) Is powered continuously during normal operation; and
 - (3) Is automatically powered for a minimum of 30 minutes from a source independent of the normal electrical generating system, after a total failure of the normal electrical generating system.
- (b) [AAC] When the standby attitude indicator is being operated by emergency power, it shall be clearly evident 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 pane when this supply is in use.

Note: Paragraph (c) shall be complied with no later than 1 April 2000.

- (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.

7.1.2.6 INSTRUMENTS AND EQUIPMENT FOR CATEGORY II/III OPERATIONS

- (a) The instruments and equipment listed in this subsection shall be installed in each aircraft operated in a Category II/III operation:

Note: This subsection does not require duplication of instruments and equipment required by 7.1.2.2 or any other provisions of Part 7.

- (1) Group I.
 - (i) Two localizer and glide slope receiving systems.

Note: Each system shall provide a basic ILS display and each side of the instrument panel must have a basic ILS display. However, a single localizer antenna and a single glide slope antenna may be used.

- (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 attitude indicators (artificial horizon).
- (v) Two heading indicators (directional gyroscope).
- (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) Two rate-of-climb and descent indicators.
- (ix) A flight control guidance system that consists of either an automatic approach coupler or a flight director system.

Note: A flight director system must display computed information as steering command in relation to an ILS localizer and, on the same instrument, either computed information as pitch command in relation to an ILS glide slope or basic ILS glide slope information. An automatic approach coupler must provide at least automatic steering in relation to an ILS localizer. The flight control guidance system may be operated from one of the receiving systems required by paragraph (a)(1)(i).

- (x) For Category II operations with decision heights below 150 feet a radio altimeter.
- (2) Group II.

- (i) Warning systems for immediate detection by the pilot of system faults in items (a)(1)(i), (a)(1)(iv), (a)(1)(iv) and (a)(1)(ix), of Group I and, if installed for use in Category III operations, the radio altimeter and auto throttle system.
 - (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.
- (3) Additionally to (1) and (2) for category III operation.
- (i) An autoflight system consisting of two or more monitored fail passive autopilots or three autopilots designed so that at least two remain operative after failure to permit comparison and provide necessary monitoring and protection while continuing to a landing.
 - (ii) An automatic throttle or thrust control system.
 - (iii) At least two radio altimeters.
 - (iv) Failure detection, annunciation and warning capability as specified in the AFM.
 - (v) Missed approach guidance system.
 - (vi) Suitable forward and side flight visibility for each pilot.
 - (vii) Suitable windshield rain removal, ice protection, or defog capability.
 - (viii) Stopping means and antiskid systems.

Implementing Standard: See IS: 7.1.2.6 for Category III/III instrument and equipment approval and maintenance requirements.

7.1.2.7 NAVIGATION EQUIPMENT FOR OPERATIONS IN MNPS AIRSPACE

- (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 flight crew 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 State of Registry for MNPS operations concerned.

Note: Equipment shall comply with minimum navigation performance specifications prescribed in ICAO Doc 7030 in the form of Regional Supplementary Procedures.

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

7.1.2.8 EQUIPMENT FOR OPERATIONS IN RVSM AIRSPACE

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

- a) shall be provided with equipment, capable of-

- (1) Indicating to the flight crew the flight level to be flown;
 - (2) Automatically maintaining a selected flight level;
 - (3) Providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed 300 ft;
 - (4) Automatically reporting pressure-altitude;
- b) shall be authorised by the State of Registry for operation in the airspace concerned.

Implementing Standard: See IS: 7.1.2.8 for Equipment for Operations in RVSM Airspace

7.1.2.9 NAVIGATION EQUIPMENT – GENERAL

- (a) [AAC] No person may operate an aircraft unless it is equipped with navigation equipment that will enable it to proceed in accordance with-
- (1) It's operational flight plan
 - (2) The prescribed RNP (required navigational performance) Types; and
 - (3) The requirements of air traffic services

Note: See ICAO Doc 9613 for information on the approval process for operations in RNP airspace.

7.1.3 Communication Equipment

7.1.3.1 RADIO EQUIPMENT

- (a) [AAC] No person may operate an aircraft unless it is equipped with radio equipment required for the kind of operation being conducted.
- (b) [AAC] All aircraft operated in VFR as a controlled flight or in IFR shall be provided with radio communication equipment capable of conducting two-way communication with those aeronautical stations and on those frequencies prescribed by the Authority, including the aeronautic emergency frequency 121.5 MHz.

Note: This requirement is considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.

- (c) [AOC] No AOC holder may operate an aircraft in commercial air transportation unless it is equipped with two operable independent radio communications systems, which for the route and airspace flown, are capable of—
- (1) Receiving meteorological information at any time during the flight.
 - (2) Conducting two-way radio communications at any time during flight with least one aeronautical Station.
 - (3) Conducting two-way radio communications with such other aeronautical stations and frequencies as may be prescribed by the Authority.

Note: Each system shall have an independent antenna installation except that, where rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used, only one antenna is required.

- (4) Secondary Surveillance Radar transponder equipment as required for the route being flown.
- (d) [AAC] 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) [AAC] No person may operate an aeroplane under IFR unless it is equipped with an audio selector panel accessible to each required flight crewmember.
- (f) [AAC] No person may operate an aircraft unless there is a boom or throat microphone available at each required flight crewmember flight duty station.
- (g) [AOC] No AOC holder may conduct single pilot IFR or night operations in commercial air transportation unless the aeroplane is equipped with a headset with boom microphone or equivalent and a transmit button on the control wheel.

7.1.3.2 CREW MEMBER INTERPHONE SYSTEM

- (a) [AOC] No AOC holder may operate an aeroplane 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.
- (b) [AOC] No AOC holder may operate an aeroplane with a maximum certified take-off mass exceeding 15,000 kg, 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 crew members to alert the cabin crew and for use by cabin crew members 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; and
 - (6) Provides on the ground a means of two-way communication between ground personnel and at least two flight crew members.

7.1.4 Aircraft Lights and Instrument Illumination

7.1.4.1 AIRCRAFT LIGHTS AND INSTRUMENT ILLUMINATION

- (a) [AAC] All aircraft operated at night shall be equipped with:
 - (1) A landing light;
 - (2) Illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft;
 - (3) Lights in all passenger compartments; and
 - (4) A flashlight for each crew member station (approval not required).
- (b) [AOC] No AOC holder may operate an aircraft by day or night 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; and
 - (5) A flashlight for each crew member station (approval not required).

- (c) [AOC] No AOC holder may operate an aircraft by night unless, in addition to the equipment specified in paragraph (a) above, it is equipped with—
- (1) Navigation/position lights;
 - (2) Two landing lights or a single light having two separately energised filaments; and
 - (3) Lights to conform to the International regulations for preventing collisions at sea if the aircraft is a seaplane or an amphibian aircraft.

7.1.5 Engine Instruments

7.1.5.1 ENGINE INSTRUMENTS

- (a) [CAT] Unless the Authority allows or requires different instrumentation for turbine engine powered aeroplanes to provide equivalent safety, no person may conduct any commercial air transport operations in any aircraft without the following engine instruments:
- (1) A fuel pressure indicator for each engine.
 - (2) A fuel flow meter.
 - (3) A means for indicating fuel quantity in each fuel tank to be used.
 - (4) An oil pressure indicator for each engine.
 - (5) An oil quantity indicator for each oil-tank when a transfer or separate oil reserve supply is used.
 - (6) An oil-in temperature indicator for each engine.
 - (7) A tachometer for each engine.
 - (8) 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.
- (b) [AOC] In addition to the listed equipment requirements in paragraph (a), reciprocating engine aircraft shall have the following:
- (1) A carburettor air temperature indicator for each engine.
 - (2) A cylinder head temperature indicator for each air-cooled engine.
 - (3) A manifold pressure indicator for each engine.
 - (4) A device for each reversible propeller, to indicate to the pilot when the propeller is in reverse pitch, that 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.

7.1.6 Warning Instruments and Systems

7.1.6.1 MACH NUMBER INDICATOR

[AAC] All aircraft with speed limitations expressed in terms of Mach number shall be equipped with a Mach number indicator.

7.1.6.2 LOSS OF PRESSURISATION INDICATOR

[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 flight crew of any dangerous loss of pressurisation.

7.1.6.3 LANDING GEAR: AURAL WARNING DEVICE

- (a) [AAC] Each aeroplane with retractable landing gear shall have a landing gear 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.
- (b) [AAC] The warning system required by paragraph (a) 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.
- (c) [AAC] The flap position-sensing unit may be installed at any suitable place in the aeroplane.

7.1.6.4 ALTITUDE ALERTING SYSTEM

- (a) [AOC] No AOC holder may operate a turbojet aircraft or an aircraft with a maximum certificated take-off mass in excess of 15000 kg, unless it is equipped with an altitude alerting system capable of—
- (1) Alerting the flight crew upon approaching preselected altitude in either ascent or descent; and
 - (2) Alerting the flight crew 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 flight crew when a deviation occurs from the selected flight level. The threshold for the alert may not exceed ± 90 m (300 ft).

7.1.6.5 GROUND PROXIMITY WARNING SYSTEM

- (a) [AAC] Effective the 1st of January 2007, no person may operate a turbine-powered aeroplane with a maximum certificated take-off mass in excess of 5700 kg or authorised to carry more than nine (9) passengers, unless it is equipped with a ground proximity warning system.

Implementing standards: See IS: 7.1.6.5(a) & (c) for Airplane Flight Manual requirements

- (b) [CAT] No person may operate a turbine-powered aeroplane with a maximum certificated take-off mass in excess of 5700 kg or authorised to carry more than nine (9) passengers, unless it is equipped with a ground proximity warning system.
- (c) [CAT] No person may operate a turbine-powered aeroplane with a maximum certificated take-off mass in excess of 15000 kg or authorised to carry more than thirty (30) passengers unless it is equipped with a ground proximity warning system that has a forward looking terrain avoidance function.
- (d) [CAT] Effective the 1st of January 2007, no AOC holder may operate a piston-powered aeroplane with a maximum certificated take-off mass in excess of 5700 kg or authorised to carry more than nine (9) passengers, unless it is equipped with a ground proximity warning system, which provides the warnings mentioned in (g) (1) and (3) and unsafe terrain clearance.

Implementing standards: See IS: 7.1.6.5(a) & (c) for Airplane Flight Manual requirements

- (e) [AAC] Effective the 1st of January 2007 each required ground proximity system shall have a forward looking terrain avoidance function.
- (f) [AAC] All turbine-powered aeroplanes with an individual certificate of airworthiness first issued on or after the 1st of January 2004, the required ground proximity warning system shall have a forward-looking terrain avoidance function.

- (g) [AAC] Each ground proximity warning system for turbine-powered aeroplanes shall automatically provide, by means of aural signals which may be supplemented by visual signals, timely and distinctive warning to the flight crew, as a minimum, warnings 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; and
 - (5) Excessive descent below the instrument glide path.

7.1.6.6 WEATHER RADAR

[AOC] No AOC holder shall operate a pressurised aircraft in commercial air transport at night or under IMC in an area where thunderstorms or other potentially hazardous weather conditions may be expected, regarded as detectable with an airborne weather radar, unless it is equipped with an operable weather radar.

7.1.6.7 AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS)

- (a) [AAC] No person shall operate a turbine-engined aeroplane with a maximum certificated take-off mass in excess of 15.000 kg or authorised to carry more than thirty (30) passengers unless it is equipped with an airborne collision avoidance system (ACAS II).
- (b) [AOC] No AOC holder shall operate a turbine powered aeroplane with a maximum certificated takeoff mass in excess of 5700 kg or authorised to carry more than nineteen (19) passengers, unless it is equipped with an airborne collision avoidance system (ACAS II).
- (c) An airborne collision avoidance system shall operate in accordance with the relevant provisions of Annex10, Volume IV.

7.1.6.8 FORWARD LOOKING WIND SHEAR WARNING SYSTEM – TURBOJET AIRCRAFT

- (a) [CAT] All turbojet airplanes of a maximum certificated takeoff mass in excess of 5700 kg or authorised to carry more than nine passengers should be equipped with a forward-looking wind shear warning system.
- (b) [CAT] The system should be capable of providing the pilot with a timely aural and visual warning of wind shear ahead of the aircraft and the information required to permit the pilot to safely commence and continue a missed approach or go-around or to execute an escape manoeuvre if necessary.
- (c) [CAT] The system should 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.

7.1.7 Flight and Cockpit Voice Recorders

7.1.7.1 COCKPIT VOICE RECORDERS

- (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) [AAC] All aeroplanes with a maximum certificated takeoff mass in excess of 27 000 kg with an individual certificate of airworthiness first issued on or after 1st January 1987;
 - (2) [AOC] All turbine-engined aeroplanes operated in commercial air transportation with a certificated takeoff mass in excess of 5 700 kg;

- (3) [AAC] All helicopters with a certificated takeoff mass in excess of 7 000 kg.
- (b) [AOC] 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 in excess of 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1st January 2003.
- (c) 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.

7.1.7.2 FLIGHT RECORDERS

- (a) No person may operate the following aircraft unless it is equipped with a flight data recorder of the mentioned type.
 - (1) [AAC] All aeroplanes with a maximum certificated takeoff mass in excess of 27000 kg and all helicopters with a maximum certificated takeoff mass in excess of 7000 kg with an individual certificate of airworthiness first issued on or after 1st January 1989 (Type I for aeroplanes and type IV for helicopters) Be either bright orange or bright yellow;
 - (2) [AAC] All aeroplanes with a maximum certificated takeoff mass in excess of 5700 kg and all helicopters with a maximum certificated takeoff mass in excess of 3180 kg with an individual certificate of airworthiness first issued on or after 1st January 2005 (Type IA for aeroplanes and type IVA for helicopters)
 - (3) [AOC] All turbine-engined aeroplanes with a maximum certificated takeoff mass in excess of 5700 kg in commercial air transport with an individual certificate of airworthiness first issued before 1st January 2005:
 - Aeroplanes issued a certificate of airworthiness on or after 1 January 1989.
 - i. All aeroplanes of a maximum certificated take off mass of over 27 000 kg shall be equipped with a Type I FDR.
 - ii. All aeroplanes of a maximum certificated take off mass of over 5 700 kg, up to and including 27000 kg, shall be equipped with a Type II FDR.
 - Aeroplanes issued a certificate of airworthiness on or after 1 January 1987 but before 1 January 1989.
 - i. All turbine-engined airplanes of a maximum certificated takeoff mass of over 5 700 kg, except those turbine-engined airplanes of a maximum certificated takeoff mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national Authority after 30 September 1969, shall be equipped with a FDR which shall record time, altitude, airspeed, normal acceleration, heading and such additional parameters as are necessary to determine: Pitch attitude; roll attitude, radio transmission keying and power on each engine.
 - ii. All turbine-engined airplanes of a maximum certificated takeoff mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national Authority after 30 September 1969 shall be equipped with a Type II FDR.
 - Aeroplanes issued a certificate of airworthiness before 1 January 1987.

All turbine-engined airplanes of a maximum certificated takeoff mass of over 5 700 kg shall be equipped with a FDR, which shall record time, altitude, airspeed, normal acceleration and heading and such additional parameters as are necessary to determine:

- A. The attitude of the aeroplane in achieving its flight path; and
- B. The basic forces acting upon the airplane resulting in the achieved *flight path and the origin of such basic forces*.

- (b) [AOC] Flight 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
- (c) Flight recorders shall be capable of retaining the information recorded during the last-
 - (1) Type I, IA and II – 25 hours of operation
 - (2) Type IIA – 30 minutes of operation
 - (3) Type IV, IVA and V – 10 hours of operation
- (d) Flight data recorder media not acceptable for use in aircraft registered in the Rep. of Suriname, or operated by AOC holders in the Rep. of Suriname are –
 - (1) Engraving metal foil;
 - (2) Photographic film; or
 - (3) Analogue data using frequency modulation.

Implementing Standard: See IS: 7.1.7.2 for specific data to be recorded by flight recorders.

7.1.7.3 COMBINATION RECORDER (CVR/FDR)

Aeroplanes required to be equipped with a FDR and a CVR may alternatively be equipped with the following number of combination (FDR/CVR) recorders-

- (1) 2 - for all aeroplanes of a certificated takeoff mass of over 5 700kg.
- (2) 1 - for all multi-engined turbine powered aeroplanes of less than 5 700kg.;

7.1.7.4 RECORDING OF DATA LINK COMMUNICATIONS

- (a) All aeroplanes 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.
 - (1) This requirement is effective-
 - (i) 1 January 2005, in all aeroplanes for which the individual certificate of airworthiness is issued after this date.
 - (ii) 1 January 2007, in all aeroplanes.
- (b) The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.
 - (1) 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.

7.1.8 Emergency, Rescue, and Survival Equipment

7.1.8.1 EMERGENCY EQUIPMENT: ALL AIRCRAFT

- (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.

7.1.8.2 EMERGENCY EXIT EQUIPMENT

- (a) [AOC] 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.
- (b) [AOC] 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 passenger aisle.
- (c) [AOC] Each large passenger-carrying aeroplane shall have an emergency lighting system, independent of the main lighting system that—
- (1) Illuminates each passenger exit marking and locating sign;
 - (2) Provides enough general lighting in the passenger cabin; and
 - (3) Includes floor proximity emergency escape path marking.
- (d) [AOC] Each passenger emergency exit and the means of opening that exit from the outside shall be marked on the outside of the aeroplane.
- (e) [AOC] Each passenger-carrying aeroplane shall be equipped with a slip-resistant escape route that meets the requirements under which that aeroplane was type certified.

Implementing Standard: See IS: 7.1.8.2 for details of the emergency exit equipment requirements.

7.1.8.3 VISUAL SIGNALLING DEVICES

- (a) [AAC] No person may operate an aircraft over water or across land areas which have been designated by Suriname 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) Visual signals for use by intercepting and intercepted aircraft; and
 - (2) At least one pyrotechnic signalling device for each life raft required for overwater operations.

7.1.8.4 SURVIVAL KITS

[AAC] No person may operate an aircraft across land areas which have been designated by Suriname 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 and is appropriately equipped for the route to be flown.

7.1.8.5 EMERGENCY LOCATOR TRANSMITTER

- (a) [AAC] All aircraft on all flights shall be equipped with an automatically activated ELT.
- (b) [AOC] No AOC holder may operate an aeroplane on long range over water flights unless it is equipped with two ELT's that meet the technical standards specified by the Authority.
- (c) [AAC] From 1st January 2007 all required ELT's shall transmit simultaneously on 121.5 and 406 MHz

- (d) [AAC] All required ELT's operating on 406 MHz, shall prior to its use, be assigned a unique coding for identification of the transmitter or aircraft on which it is fitted. This coding will be assigned by the authority after application therefore by the aircraft owner or operator.
- (e) [AOC] At least one survival type ELT shall be located with each liferaft carried (See 7.1.8.17).
- (f) [AAC] Batteries used in ELT's shall be replaced (or recharged if the battery is rechargeable) when—
 - (1) The transmitter has been in use for more than one cumulative hour; or
 - (2) 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired.
- (g) [AAC] The expiration date for a replacement or recharged ELT battery shall be legibly marked on the outside of the transmitter.

Note: The battery useful life (or useful life of charge) requirements do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

7.1.8.6 PORTABLE FIRE EXTINGUISHERS

- (a) [AAC] 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.

Note: When discharged, the portable fire extinguisher shall not cause dangerous contamination of the air within the aircraft.

- (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 authorised to carry more than thirty (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	
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

7.1.8.7 LAVATORY FIRE EXTINGUISHER

- (a) [AOC] No AOC holder may operate a passenger-carrying transport category aeroplane unless each lavatory in the aeroplane is equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste located within the lavatory.

- (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.

7.1.8.8 LAVATORY SMOKE DETECTOR

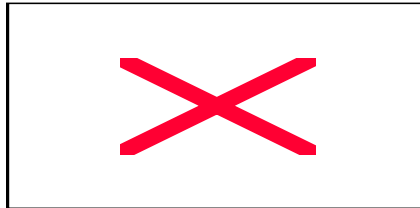
- (a) [AOC] No AOC holder may operate a passenger-carrying transport category aeroplane unless each lavatory in the aeroplane is equipped with a smoke detector system or equivalent that provides—
- (1) A warning light in the cockpit; or
 - (2) A warning light or audio warning in the passenger cabin which would be readily detected by a flight attendant, taking into consideration the positioning of flight attendants throughout the passenger compartment during various phases of flight.

7.1.8.9 CRASH AXE

[AOC] No AOC holder shall operate a large aeroplane unless it is equipped with a crash axe appropriate to effective use in that type of aeroplane, stored in a place not visible to passengers on the aeroplane.

7.1.8.10 MARKING OF BREAK-IN POINTS

- (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.



- (b) 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.

7.1.8.11 FIRST-AID AND EMERGENCY MEDICAL KIT

- (a) [AOC] No AOC holder may operate an aircraft unless it is equipped with accessible first-aid kits and, on passenger flights, 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 type, number, location and contents of first-aid and medical kits to be carried shall comply with Implementing Standard: [IS: 7.1.8.11](#)

Implementing Standard: See IS: 7.1.8.11 for details of first-aid medical supplies.

7.1.8.12 OXYGEN STORAGE AND DISPENSING APPARATUS

- (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) [AOC] No AOC holder may operate an aeroplane at altitudes above 10,000 feet unless it is equipped with oxygen masks, located so as to be within the immediate reach of flight crew members while at their assigned duty station.
- (d) [AOC] No AOC holder may operate a pressurised aeroplane at altitudes above 25,000 feet unless:
 - (1) Flight crew 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 or her location at the time of cabin pressurisation failure
 - (3) 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.
- (e) [AOC] 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.

Implementing Standard: See IS: 7.1.8.12 to determine the amount of supplemental oxygen needed for non-pressurised and pressurised aircraft.

7.1.8.13 PROTECTIVE BREATHING EQUIPMENT

- (a) [AOC] No AOC holder may operate an aeroplane with a maximum certified takeoff mass exceeding 5700 kg, or authorised to carry more than nineteen (19) passengers unless—
 - (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.

7.1.8.14 FIRST AID OXYGEN DISPENSING UNITS

- (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—
 - (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/minute/person; and
- (3) At least 2% of the passengers carried, but in no case for less than one person.

7.1.8.15 MEGAPHONES

- (a) [AOC] Each AOC holder 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 authorised to carry 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 flight attendant seat; and
 - (2) On aeroplanes authorised to carry 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 flight attendant seat.

Note: The Authority may grant a deviation from the requirements of paragraph (b) if the Authority finds that a different location would be more useful for evacuation of persons during an emergency.

7.1.8.16 INDIVIDUAL FLOTATION DEVICES

- (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 with either one or two power units inoperative; 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) One life-jacket or equivalent flotation device equipped with a means of electronic 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.

7.1.8.17 LIFE RAFT

- (a) [AAC] All aeroplanes when operated on extended flights over water away from land suitable for making an emergency landing at a distance of more than 185 km (100 NM), in case of single-engined aeroplanes, and more than 370 km (200 NM), in case of multi-engined aeroplanes capable of continuing flight with one engine inoperative, shall be equipped with live-saving rafts in sufficient numbers to carry all persons on board.
- (b) [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 equipped with live-saving rafts in sufficient numbers to carry all persons on board.
- (c) [AOC] In addition to the equipment prescribed in § 7.1.8.16, 7.1.9.15 and § 7.1.9.16 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, that are able to continue the flight to a suitable aerodrome, without flying below the minimum flight altitude at any point

- i. in the event of the critical power-unit becoming inoperative at any point along the route or planned diversions there from, and
 - ii. in the event of any two power-units becoming inoperative, for aeroplanes having three or more power-units, on any part of the route where the location of en-route aerodromes and total duration of the flight are such that the probability of a second power-unit becoming inoperative must be considered.
- (2) All other aeroplanes when they are operated 30 minutes or 100 NM, whichever is the lesser, away from land suitable for making an emergency landing.
- (d) All life saving rafts shall be stowed so as to facilitate their ready use in an emergency.
- (e) Life rafts shall be equipped with the following life sustaining equipment—
 - (1) A survivor locator light;
 - (2) A survival kit;
 - (3) A pyrotechnic signalling device; and
 - (4) An ELT (See 7.1.8.5).
- (f) [AOC] Life rafts which are not deployable by remote control and which have a mass of more than 40 kg shall be equipped with some means of mechanically assisted deployment.

7.1.8.18 FLOTATION DEVICE FOR HELICOPTER DITCHING

[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.

7.1.9 *Miscellaneous Systems and Equipment*

7.1.9.1 SEATS, SAFETY BELTS, AND SHOULDER HARNESSSES

- (a) [AOC] 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:
 - (1) A seat with safety belt for each person on board over an age of 2 years; and a restraining belt for each berth on board the aircraft.
 - (2) A safety harness for each flight crewmember seat. 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.

Note: The safety harness for each pilot seat, which includes shoulder straps and a seat belt, should 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 safety harness for each cabin attendant station in the passenger compartment. .
 - (4) [AOC] The cabin attendant's seats shall be located near floor level and other emergency exits as required by the Authority for emergency evacuation.

7.1.9.2 PASSENGER AND PILOT COMPARTMENT DOORS

- (a) [AOC] Pilot compartment door -
 - (1) No person may operate a passenger carrying aeroplane of a maximum certificated takeoff mass in excess of 45 500 kg or authorised to carry more than sixty (60) passengers 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 45 500 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 key, readily available for each crewmember, for each door that separates a passenger compartment from another compartment that has emergency exit provisions;

7.1.9.3 PASSENGER INFORMATION SIGNS

- (a) [AOC] No AOC holder may operate a passenger carrying aeroplane 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 shall be fastened, 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 shall 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."

7.1.9.4 PUBLIC ADDRESS SYSTEM

- (a) [AOC] No AOC holder may operate a passenger carrying aeroplane authorised to carry more than nineteen (19) passengers 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) Has a microphone which is readily accessible to the seated cabin crew member, for each required floor level passenger emergency exit which has an adjacent cabin crew seat, 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; and
 - (3) 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; and
 - (4) Is audible and intelligible at all passenger seats, toilets, and cabin crew seats and workstations.

7.1.9.5 MATERIALS FOR CABIN INTERIORS

- (a) [AOC] Upon the first major overhaul of an aeroplane cabin or refurbishing of the cabin interior, all materials in each compartment used by the crew or passengers that do not meet the current airworthiness requirements

pertaining to materials used in the interior of the cabin for type certification in the transport category as cited by the Authority, shall be replaced with materials that meet the requirements specified by the Authority.

- (b) [AOC] Seat cushions, except those on flight crew member seats, in any compartment occupied by crew or passengers shall meet requirements pertaining to fire protection as specified by the Authority.

7.1.9.6 MATERIALS FOR CARGO AND BAGGAGE COMPARTMENTS

- (a) [AOC] Each Class C or D cargo compartment greater than 200 cubic feet in volume in a transport category aeroplane type certified after January 1, 1958 shall have ceiling and sidewall liner panels which are constructed of—
 - (1) Glass fibre reinforced resin;
 - (2) Materials which meet the test requirements for flame resistance of cargo compartment liners as prescribed for type certification; or
 - (3) In the case of installations approved prior to March 20, 1989, aluminium.

Note: The term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain fire.

7.1.9.7 POWER SUPPLY, DISTRIBUTION, AND INDICATION SYSTEM

- (a) [AOC] No AOC holder may not operate an aeroplane unless it is equipped with—
 - (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 external power supply if any one power source or component of the power distribution system fails.

Note: The use of common elements in the power system may be approved if the Authority finds that they are designed to be reasonably protected against malfunctioning.

- (3) A means for indicating the adequacy of the power being supplied to required flight instruments.
- (b) [AOC] Engine-driven sources of energy, when used, shall be on separate engines.

7.1.9.8 PROTECTIVE CIRCUIT FUSES

[AAC] No person may operate an aeroplane in which protective fuses are installed unless there are spare fuses available for use in flight equal to at least 10% of the number of fuses of each rating or three of each rating whichever is the greater.

7.1.9.9 ICING PROTECTION EQUIPMENT

- (a) [AAC] Unless an aeroplane is certified under the transport category airworthiness requirements relating to ice protection, no person may operate an aeroplane in icing conditions unless it is equipped for the prevention or removal of ice on windshields, wings, empennage, propellers, and other parts of the aeroplane where ice formation will adversely affect the safety of the aeroplane.
- (b) [AOC] No AOC holder 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.

Note: 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.

7.1.9.10 PITOT HEAT INDICATION SYSTEMS

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

- (1) The indication provided shall incorporate amber light that is in clear view of a flight crew member.
- (2) The indication provided shall be designed to alert the flight crew if either the pitot heating system is switched "off," or the pitot heating system is switched "on" and any Pitot tube heating element is inoperative.

7.1.9.11 STATIC PRESSURE SYSTEM

[AOC] No AOC holder may operate an aircraft unless 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.

7.1.9.12 WINDSHIELD WIPERS

[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.

7.1.9.13 CHART HOLDER

[AOC] No AOC holder may operate an aeroplane unless a chart holder is installed in an easily readable position which can be illuminated for night operations.

7.1.9.14 COSMIC RADIATION DETECTION EQUIPMENT

[AOC] An AOC holder shall ensure that aeroplanes intended to be operated above 15000 m (49 000 ft) are equipped with 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.

7.1.9.15 MARITIME SOUND SIGNALLING DEVICE

[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.

7.1.9.16 ANCHORS

[AAC] All seaplanes for all flights shall be equipped with one anchor, and one sea anchor (drogue), when necessary to assist in manoeuvring (approval for the anchors not required).

Note.- "Seaplanes" includes amphibians operated as seaplanes.

CIVIL AVIATION REGULATIONS

SURINAME

PART 7 - IMPLEMENTING STANDARDS

VERSION 4.0

January 2006

For ease of reference, the number assigned to each implementing standard corresponds to its associated regulation.
For example, IS: 7.1.7.2 would reflect a standard required in subsection 7.1.7.2.

IS: 7.1.2.6 CATEGORY II/III: INSTRUMENTS AND EQUIPMENT APPROVAL AND MAINTENANCE REQUIREMENTS

- (a) *General.* The instruments and equipment required by 7.1.2.6 shall be approved as provided in this implementing standard before being used in Category II/III operations. Before presenting an aircraft for approval of the instruments and equipment, it must be shown 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 Glide slope Receivers."
 - (2) The altimeters and the static pressure systems were tested and inspected; and
 - (3) All other instruments and items of equipment specified in 7.1.2.6 that are listed in the proposed maintenance program were bench checked and found to meet the manufacturer's specifications.
- (b) *Flight control guidance system.*
- (1) All components of the flight control guidance system shall be approved 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 under this paragraph. Related systems or devices, such as the autothrottle and computed missed approach guidance system, shall be approved in the same manner if they are to be used for Category II/III operations.
 - (2) For Category III operations the autoflight system shall consist of:
 - i. Two or more monitored fail passive autopilots or integrated autopilot flight director systems each with dual channels making up an automatic fail operational system designed so that at least one autoflight system remains operative after the failure of one system, and the failed system is not used or cannot cause unacceptable autoflight system performance; or
 - ii. Three autopilots or integrated autopilot flight director systems designed so that at least two remain operative after the failure to permit comparison and provide necessary monitoring and protection while continuing to a landing.
 - (3) Missed approach guidance provided by one or more of the following means:
 - i. attitude displays which include suitable pitch attitude markings, or pre-established computed pitch command display; or
 - ii. an approved flight path angle display; or
 - iii. an automatic or flight guidance go-around capability
- (c) *Radio altimeter.* A radio altimeter must meet the performance criteria of this paragraph for original approval and after each subsequent alteration.
- (1) It shall display to the flight crew clearly and positively the wheel height of the main landing gear above the terrain.
 - (2) It 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, it 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 altimeter to unlock, and indicator response to such

changes must not exceed 0.1 seconds and, in addition, if the system unlocks for greater changes, it 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 7.1.2.6 shall be capable of performing as necessary for Category II/III operations. Approval is also required after each subsequent alteration to these instruments and items of equipment.
- (e) *Evaluation program.*
- (1) *Application.* Approval by evaluation is requested 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 100 foot decision height for Category II operations or the applicable decision height for Category III operations and 90 percent of the total approaches made shall be successful. A successful approach is one in which—
 - (i) At the 100 foot decision height for Category II operations or the applicable decision height for Category III operations, 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 auto throttles are used);
 - (ii) The aircraft at the 100 foot decision height for Category II operations or the applicable decision height for Category III operations, 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.
 - (vi) In case of an aircraft equipped with autopilot systems capable of auto landing (required for Category III operations), a successful autoland is made
 - (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.
 - (iii) Speed control at the 100 foot DH for Category II operations or the applicable decision height for Category III operations 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 and autoland, if applicable.

- (4) *Evaluation.* A final evaluation of the flight control guidance system is made upon successful completion of the demonstrations. If no hazardous tendencies have been displayed or are otherwise known to exist, the system is approved as installed.
- (f) Each maintenance program for Category II/III instruments and equipment shall contain the following:
- (1) A list of each instrument and item of equipment specified in 7.1.2.6 that is installed in the aircraft and approved for Category II/III operations, including the make and model of those specified in 7.1.2.6 (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 7.1.2.6 (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 7.1.2.6 (a)(1) to perform as approved for Category II/III 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/III approval condition before it is returned to service for Category II/III operations.
 - (8) A procedure for an entry in the maintenance records that shows the date, airport, and reasons for each discontinued Category II/III 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, it shall be performed by a certificated repair station holding one of the following ratings as appropriate to the equipment checked:
 - (i) An instrument rating.
 - (ii) An avionics rating.
 - (2) It 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) It 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/III 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, a request to extend the period for checks, tests, and inspections is approved if it is shown that the performance of particular equipment justifies the requested extension.

IS: 7.1.2.8 EQUIPMENT FOR OPERATIONS IN RVSM AIRSPACE

[AAC] The altitude-keeping equipment required for flights in airspace where RVSM is applied shall be operational and maintained in accordance with an approved maintenance program.

The equipment shall at least conform to the following:

(1) Two independent altitude measurement systems comprised of the following elements:

- (i) Cross-coupled static source system provided with ice protection, if located on the aircraft in areas subject to ice accretion;
- (ii) Equipment for measuring static pressure sensed by the static source, converting it to pressure altitude and displaying pressure altitude to the flight crew;
- (iii) Equipment for providing a digitally-coded signal corresponding to the displayed pressure altitude for automatic altitude reporting purposes;
- (iv) Static source error correction (SSEC), if required to meet RVSM altimetry system error requirements;
- (v) Equipment to provide reference signals for automatic altitude control and alerting systems

(2) One Secondary Surveillance Radar (SSR) altitude reporting transponder

If only one is fitted, it should have the capability for switching to operate from either altitude measurement system.

(3) One altitude alerting system. (CARS 7.1.6.4(b))

The altitude deviation warning system should signal an alert when the altitude displayed to the flightcrew deviates from selected altitude by more than a nominal value. For aircraft for which application for type certification or major change in type design was made prior to January 1, 1997, the nominal value shall not be greater than ± 300 ft (± 90 in). For aircraft for which application for type certification or major change in type design was made after January 1, 1997, the nominal value should not be greater than ± 200 ft (± 60 in). The overall equipment tolerance in implementing these nominal threshold values should not exceed 150 ft (± 15 in).

(4) One automatic altitude control system capable of automatically controlling the aircraft to a referenced pressure altitude

(1) As a minimum, a single automatic altitude control system should be installed which is capable of controlling aircraft height within a tolerance band of ± 65 ft (± 20 in) about the acquired altitude when the aircraft is operated in straight and level flight under non-turbulent, non-gust conditions.

Note. Aircraft types for which application for Type Certification was made prior to January 1, 1997, which are equipped with automatic altitude control system with flight management system / performance management system inputs which allow variations up to ± 130 ft (± 40 m) under non-turbulent, non-gust conditions do not require retrofit or design alteration.

(2) Where an altitude select/acquire function is provided, the altitude select/acquire control panel must be configured such that an error of no more than ± 25 ft (± 8 in) exists between the display selected by the flight crew and the corresponding output to the control system.

(5) TCAS II equipment that meets United States Technical Standard Order TSO C-119b (7 or later version)

IS: 7.1.6.5 GROUND PROXIMITY WARNING SYSTEM

(a) & (c) With regard to the GPWS equipment required by this section, the Airplane Flight Manual shall contain –
Appropriate procedures for:

- (i) The use of the equipment;
- (ii) Proper flight crew action with respect to the equipment; and
- (iii) Deactivation for planned abnormal and emergency conditions; and

An outline of all input sources that must be operating.

IS: 7.1.7.2 FLIGHT RECORDERS

(a) Types of 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 IA FDR are listed below. 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 systems or the flight crew 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 synchronization 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

- (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*
- (3) 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:
- (4) Type IV FDRs shall record the parameters required to determine accurately:
- (i) The flight path
 - (ii) Speed
 - (iii) Altitude
 - (iv) Engine power and operation
- (5) Type V FDRs shall record the parameters specified in paragraph (a) (4) (i) through (iii) of this section, and the parameter required to accurately determine engine power.

**Table A – Aeroplanes
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	95 km/h (50 kt) to max V_{S0} (Note 1) V_{S0} to 1.2 V_D (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 discrettes	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

20	Radio altitude—	-6 m to 750 m (-20 ft to 2 500 ft)	1	uniquely required +/-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 (<i>Note 5</i>)	Full range	4	As installed
26	DME 1 and 2 distance (<i>Notes 5 and 6</i>)	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) (<i>Note 7</i>)	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_{S0} 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 flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;
 - 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.).

**Table B – Helicopters
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	360degrees	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 <i>(Note 1)</i>	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) <i>(Note 2)</i>	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 discrettes	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	Sling 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

21	Lateral acceleration	+/-1 g	0.25	datum error of +/-5% +/-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	Glide path deviation	Signal range	1	+/-3%
24	Localizer deviation	Signal range	1	+/-3%
25	Marker beacon passage	Discrete	1	
26	Master warning	Discrete	1	
27	NAV 1 and 2 frequency selection (<i>Note 3</i>)	Full range	4	As installed
28	DME 1 and 2 distance (<i>Notes 3 and 4</i>)	0-370 km	4	As installed
29	Navigation data (latitude/longitude, ground speed) (<i>Note 5</i>)	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 flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and auto flight 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 data; and

- 4) the identity of displayed pages for emergency procedures and checklists; and
- b) additional engine parameters (EPR, N1, EGT, fuel flow, etc.).

IS: 7.1.8.2 EMERGENCY EXIT EQUIPMENT

- (a) The assisting means for a floor level emergency exit shall meet the requirements under which the aeroplane was type certified.
- (b) The location of each passenger emergency exit shall be—
 - (1) Recognisable from a distance equal to the width of the cabin.
 - (2) Indicated by a sign visible to occupants approaching along the main passenger aisle.
- (c) There shall be an emergency exit locating sign—
 - (1) 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;
 - (2) 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
 - (3) 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.
- (d) 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.

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

- (e) 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.
- (f) 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.
- (g) Each emergency light shall—
 - (1) Be operable manually both from the flight crew station and from a point in the passenger compartment that is readily accessible to a normal flight attendant seat;
 - (2) Have a means to prevent inadvertent operation of the manual controls; and
 - (3) When armed or turned on at either station, remain lighted or become lighted upon interruption of the aeroplane's normal electric power.
 - (4) Provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing.
 - (5) Have a cockpit control device that has an "on", "off", and "armed" position.
- (h) 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.
- (i) No operating handle or operating handle cover may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts.

- (j) Access to emergency exits shall be provided as follows for each passenger carrying aeroplane:
- (1) 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.
 - (2) 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 (f) 1. of this section.
 - (3) 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.
 - (4) 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.
 - (5) No door may be installed in any partition between passenger compartments.
 - (6) 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.
- (k) 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.
- (l) 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:
- (1) If the reflectance of the darker colour is 15 percent or less, the reflectance of the lighter colour shall be at least 45 percent.
 - (2) 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.
- Note: "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives.*
- (3) 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.
- (m) 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.
- (n) 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.
- (o) 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.

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

- (p) 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.
- (q) On each large passenger-carrying turbojet powered aeroplane with a maximum certificated take-off mass in excess of 5700 kg each ventral exit and tail cone exit shall be—
 - (1) Designed and constructed so that it cannot be opened during flight; and
 - (2) 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.

IS: 7.1.8.11 FIRST- AID AND EMERGENCY MEDICAL KIT

(a) Types, Number, Location and Contents Of Medical Supplies

(1) Types

Two types of medical supplies should be provided: first-aid kit(s) for carriage in all aeroplanes and a medical kit for carriage where the aeroplane is authorized to carry more than 250 passengers.

(2) Number of first-aid kits

- (i) Each aircraft operated by an AOC holder shall carry first-aid kits in accordance with the following schedule.

Number Of Passenger Seats	Number Of First-Aid Kits
0 – 50	1
51 – 150	2
151 – 250	3
More than 250	4

(3) Location

- (i) The required first-aid kits shall be distributed evenly throughout the passenger cabin and shall be readily accessible to cabin attendants; and
- (ii) The first-aid kits shall be located near the aircraft exits should their use be required outside the aircraft in an emergency situation.
- (iii) The medical kit, when required, shall be stored in a secure location.

(4) Contents

- (i) The required first-aid kits shall include the following:
 - (A) a handbook on first aid
 - (B) “ground-air visual signal code for use by survivors” as contained in Annex 12
 - (C) materials for treating injuries
 - (D) ophthalmic ointment
 - (E) a decongestant nasal spray
 - (F) insect repellent
 - (G) emollient eye drops
 - (H) Sunburn cream

- (I) Water-miscible antiseptic/skin cleanser
- (J) Materials for treatment of extensive burns
- (K) Oral drugs as follows: analgesic, antispasmodic, central nervous system stimulant, circulatory stimulant, coronary vasodilator, antidiarrhoeic and motion sickness medications
- (L) An artificial plastic airway and splints.

(ii) The required emergency medical kit shall include the following:

Equipment

- (A) One pair of sterile surgical gloves
- (B) Sphygmomanometer
- (C) Stethoscope
- (D) Sterile scissors
- (E) Haemostatic forceps
- (F) Haemostatic bandages or tourniquet
- (G) Sterile equipment for suturing wounds
- (H) Disposable syringes and needles
- (I) Disposable scalpel handle and blade

Drugs

- (J) Coronary vasodilators
- (K) Analgesics
- (L) diuretics
- (M) anti-allergics
- (N) steroids
- (O) sedatives
- (P) ergometrine
- (Q) where compatible with regulations of the appropriate authority, a narcotic drug in injectable form
- (R) injectable broncho dilator.

IS: 7.1.8.12 OXYGEN STORAGE AND DISPENSING APPARATUS

- (a) The supplemental oxygen supply requirements for non-pressurised aircraft are as follows:
- (1) Flight crew 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.
 - (2) 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.

Table 1- Supplemental Oxygen for Non-Pressurised Aeroplanes

(a)	(b)
SUPPLY FOR:	DURATION AND PRESSURE ALTITUDE
1. All occupants of flight deck seats on flight	Entire flight time at pressure altitudes above

deck duty	10,000 feet
2. All required cabin crew members	Entire flight time at pressure altitudes above 13,000 ft and for any period exceeding 30 minutes at pressure altitudes above 10,000 ft but not exceeding 13,000 ft
3. 100% of passengers	Entire flight time at pressure altitudes above 13,000 ft
6. 10% of passengers	Entire flight time after 30 minutes at pressure altitudes greater than 10,000 ft but not exceeding 13,000 ft

- (b) The supplemental oxygen supply requirements for pressurised aircraft are as follows:
- (1) 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 Manual to a safe altitude for the route to be flown that will allow continued safe flight and landing.
 - (2) Following a cabin pressurisation failure, the cabin pressure altitude shall be considered the same as the aeroplane 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 altitude. Under these circumstances, this lower cabin pressure altitude may be used as a basis for determination of oxygen supply.
 - (3) Flight crew members.
 - (i) 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. Flight deck seat occupants, not supplied by the flight crew source, are to be considered as passengers for the purpose of oxygen supply.
 - (4) Cabin crew members, additional crew members, and passengers
 - (i) 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.
 - (ii) 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 14,000 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 14,000 ft.

Table 2 - Requirements for Supplemental Oxygen - Pressurised Aeroplane During and Following Emergency Descent (Note 1)

SUPPLY FOR:	DURATION AND CABIN PRESSURE ALTITUDE
All occupants of flight deck seats on flight deck duty flight	Entire flight time when the cabin pressure altitude exceeds 13,000 and entire time when the cabin pressure altitude exceeds 10,000 ft but does not exceed 13,000 ft after the first 30 minutes at those altitudes, but in no case less than: (i) 30 minutes for aeroplanes certificated to fly at

	altitudes not exceeding 25,000 ft (Note 2) (ii) 2 hours for aeroplanes certificated to fly at altitudes more than 25,000 ft (Note 3).
2. All required cabin crew members	Entire flight time when cabin pressure altitude exceeds 13,000 ft but not less than 30 minutes (Note 2), and entire flight time when cabin pressure altitude is greater than 10,000 ft but does not exceed 13,000 ft 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 15,000 ft whichever is the greater (Note 4)
6. 30% of passengers	Entire flight time when the cabin pressure altitude exceeds 13,000 ft but does not exceed 15,000 ft
5. 10% of passengers	Entire flight time when the cabin pressure altitude exceeds 10,000 ft but does not exceed 13,000 ft after the first 30 minutes at these altitudes.

Note 1: The supply provided shall take account of the cabin pressure altitude and descent profile for the routes concerned.

Note 2: The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10,000 ft in 10 minutes and followed by 20 minutes at 10,000 ft.

Note 3: The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10,000 ft in 10 minutes and followed by 110 minutes at 10,000 ft. The oxygen required to meet the Crew Protective Breathing Equipment provisions of this Part may be included in determining the supply required.

Note 4: The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 15,000 ft.