2026/06/15 **All KCASR Stockholders and Users** 2026/077/SUPDT-R/41

*Subject.:* ***Notice of Proposed Amendment's (NPA) No. 2026-12 to Kuwait Civil Aviation Safety Regulations KCASR 6 – OPERATION OF AIRCRAFTPART - GENERAL AVIATION Rev 05.***

Dear Sir,

**Purpose:**

The purpose of this NPA is to announce to the KCASR users the intention of the Civil Aviation Authority to amend ***KCASR 6 – OPERATION OF AIRCRAFTPART - GENERAL AVIATION*** (issue 4) to comply with ICAO standers and recommended practices up to amendment (43).

**Action Required:**

All users of KCASR are required to refer to the CAA/ASD website (https://kcasr.dgca.gov.kw) for reviewing the NPA and mail or email (safety@dgca.gov.kw) their comments by 24/Sep/2026 using the attached NPA Response Sheet Forms No. 1500 or using NPA comments & feedback form on the website. If we do not receive your response by this date, it will be assumed that you do not have any comments on the proposal.

If required, the CAA/Aviation Safety Department personnel are available to answer your questions on the interpretation and intended implementation of the proposed amendments.

This is for your information and distribution to the concerned parties.

Yours Sincerely,

**President of Civil Aviation**

Abdullah F. Alrajhi
Acting / Deputy Director General
for Aviation Safety, Air Transport & Aviation Security

CC: Director General of Civil Aviation.
Dy. Dir. Gen. Kuwait. Intel. Airport Affairs.
Dy. Dir. Gen. for Air Navigation Services Affairs.
Safety Management Coordination Center (SMCC).
Head of Technical Office.
Civil Aviation Security Department.
Aviation Safety Director.
Air Transport Director.
Legal Department

# NPA RESPONSE FORM

NPA 2026-12

**Please add your comments on the proposal by ticking [✓] the appropriate box below.**

Any additional constructive comments, suggested amendments or alternative action will be welcome and may be provided on this response sheet or by separate correspondence.

☐ No comments on the proposal.

☐ Comments on the proposal. (Please provide explanatory comment).

| | |
|---|---|
| Name: | Organization: |
| Address/Contact No: | |
| E-Mail: | |
| Signature: | Date: |

# Notes on the presentation of the Amendment
# Notice Of Proposed Amendment
# (NPA)

**The text of the amendment is arranged to show deleted text in Red Color and with a line through it, new text to be inserted is in Blue color as shown below:**

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| ~~Text to be deleted is in Red and shown with a line through it.~~ | **Text to be deleted** |
| New text to be inserted is in Blue Color. | **New text to be inserted** |
| ~~Text to be deleted is in Red and shown with a line through it~~, followed by the replacement text which is in Blue Color. | **New text to replace existing text** |
| **. . . Indicates that remaining text is unchanged in front or following the reflected amendment.** | **Text is unchanged** |

# Notice Of Safety Regulation Amendment
# (NPA, NSRA and Revisions)

**Side bar indicates that text is changed or added.**




# Kuwait Civil Aviation Safety Regulations

# KCASR 6 – OPERATION OF AIRCRAFT

## PART - GENERAL AVIATION

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## Amendment Record

| Amendment No | Date of Issue | Remarks |
|---|---|---|
| New Issue | Dec 2024 | NPA 2024-14 Including Annex 6 part 2 up to amendment (41) |
| 01 | Sep 2025 | Updated it accordance with NPA 2025-14 in order to be aligned with ICAO annex 6-part II Amendment 42 |
| 02 | Nov 2026 | Updated it accordance with NPA 2026-12 in order to be aligned with ICAO annex 6-part II Amendment 43 |
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# Control of this Document

## DC.1 Introduction

DC.1.1Pursuant to Law No. (85) of the year 2025 and law No. (30) of the year 1960 and subsequent Ministerial Decisions No (3) of the year 1986, No (18) of the year 1990, and No (3) of the year 1996, based upon that Law and as reflected in the Preamble to the [Category] (KCASR), Issue 4, Rev.2, August 2019, the President of the Kuwait Civil Aviation is empowered to adopt and amend the Kuwait Civil Aviation Safety Regulations (KCASR). In accordance herewith, the following Regulation is hereby established for compliance by all persons concerned. This Regulation shall be known as KCAR 6 – Part General Aviation and any reference to this title shall mean referring to these governing the requirements to be met for the certification of air operations.

## DC.2 Authority for this Regulation

DC.2.1This KCASR 6 – Part General Aviation is issued on the authority of the President of the Kuwait Civil Aviation.

## DC.3 Applicability

DC.3.1This KCAR 6 – Part General Aviation is applicable to the aviation industry of the State of Kuwait.

## DC.4 Scope

DC.4.1KCAR 6 – Part General Aviation contains the Regulation for the air operations requirements of the General Aviation, and shows compliance with ICAO Annex 6 Part II. The AMC & GM are separated into the following parts with cross references between parts where applicable.

Part ARO Authority Regulations for Air Operations

Part ORO Organisation Regulations for Air Operations

Part DEF Definitions

Part CAT Commercial Air Transport

Part SPA Specific Approvals

Part SPO Special Operations

Part ARO Authority Regulations for General Aviation

## DC.5 Definitions

DC.5.1Terms not defined shall have the meaning given to them in the relevant legal instruments or international legal instruments in which they appear, especially as they appear in the KCASR 00 Attachment 1 and Convention and its Annexes.

# ABBREVIATIONS AND SYMBOLS

Abbreviations

| | |
|---|---|
| AC | Alternating current |
| ACAS | Airborne collision avoidance system |
| ADREP | Accident/incident reporting |
| ADRS | Aircraft data recording system |
| ADS | Automatic dependent surveillance |
| AFCS | Automatic flight control system |
| AIR | Airborne image recorder |
| AIRS | Airborne image recording system |
| AOC | Air operator certificate |
| APCH | Approach |
| APU | Auxiliary power unit |
| AR | Authorization required |
| ARINC | Aeronautical Radio, Incorporated |
| ASE | Altimetry system error |
| ATC | Air traffic control |
| ATM | Air traffic management |
| ATN | Aeronautical telecommunication network |
| ATS | Air traffic services |
| | |
| CARS | Cockpit audio recording system |
| CAT I | Category I |
| CAT II | Category II |
| CAT III | Category III |
| CFIT | Controlled flight into terrain |
| CG | Centre of gravity |
| cm | Centimetre |
| CPDLC | Controller-pilot data link communications |
| CVR | Cockpit voice recorder |
| CVS | Combined vision system |

| | |
|---|---|
| DA | Decision altitude |
| DA/H | Decision altitude/height |
| DC | Direct current |
| D-FIS | Data link-flight information services |
| DH | Decision height |
| DLR | Data link recorder |
| DLRS | Data link recording system |
| DME | Distance measuring equipment |
| DSTRK | Desired track |
| FATO | Final approach and take-off area |
| EFB | Electronic flight bag |
| EFIS | Electronic flight instrument system |
| EGT | Exhaust gas temperature |
| EICAS | Engine indication and crew alerting system |
| ELT | Emergency locator transmitter |
| ELT(AD) | Automatic deployable ELT |
| ELT(AF) | Automatic fixed ELT |
| ELT(AP) | Automatic portable ELT |
| ELT(S) | Survival ELT |
| EPR | Engine pressure ratio |
| EUROCAE | European Organisation for Civil Aviation Equipment |
| EVS | Enhanced vision system |
| FANS | Future air navigation system |
| FDR | Flight data recorder |
| FL | Flight level |
| FM | Frequency modulation |
| ft | Foot |
| ft/min | Feet per minute |

| | |
|---|---|
| g | Normal acceleration |
| GBAS | Ground-based augmentation system |
| GCAS | Ground collision avoidance system |
| GLS | GBAS landing system |
| GNSS | Global navigation satellite system |
| GPS | Global positioning system |
| GPWS | Ground proximity warning system |
| hPa | Hectopascal |
| HUD | Head-up display |
| IAOPA | International Council of Aircraft Owner and Pilot Associations |
| IBAC | International Business Aviation Council |
| IFR | Instrument flight rules |
| ILS | Instrument landing system |
| IMC | Instrument meteorological conditions |
| inHg | Inch of mercury |
| INS | Inertial navigation system |
| ISA | International standard atmosphere |
| kg | Kilogram |
| km | Kilometre |
| km/h | Kilometres per hour |
| kN | Kilonewton |
| kt | Knot |
| lbf | Pound-force |
| LDAH | Landing distance available (helicopter) |
| LDP | Landing decision point |
| LDRH | Landing distance required (helicopter) |
| LED | Light emitting diode |

| | |
|---|---|
| m | Metre |
| mb | Millibar |
| m/s | Metres per second |
| MDA | Minimum descent altitude |
| MDA/H | Minimum descent altitude/height |
| MDH | Minimum descent height |
| MEL | Minimum equipment list |
| MHz | Megahertz |
| MLS | Microwave landing system |
| MMEL | Master minimum equipment list |
| MNPS | Minimum navigation performance specification |
| MOPS | Minimum operational performance specification |
| NAV | Navigation |
| NM | Nautical mile |
| NVIS | Night vision imaging systems |

N1 Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)

N2 High pressure compressor speed (two-stage compressor); intermediate pressure compressor (three-stage compressor)

| | |
|---|---|
| N3 | High pressure compressor speed (three-stage compressor) |
| OCA | Obstacle clearance altitude |
| OCA/H | Obstacle clearance altitude/height |
| OCH | Obstacle clearance height |
| PANS | Procedures for Air Navigation Services |
| PBC | Performance-based communication |
| PBN | Performance-based navigation |
| PBS | Performance-based surveillance |
| PNR | Point of no return psi Pound per square inch |

| | |
|---|---|
| R | Rotor radius of helicopter |
| RCP | Required communication performance |
| RFFS | Rescue and firefighting service |
| ~~RNAV~~ | ~~Area navigation~~ |
| RNP | Required navigation performance |
| RNPSOR | Required navigation performance and special operational requirements |
| RSP | Required surveillance performance |
| RTCA | Radio Technical Commission for Aeronautics |
| RVR | Runway visual range |
| RVSM | Reduced vertical separation minima |
| SBAS | Satellite-based augmentation system |
| SI | International System of Units |
| SOP | Standard operating procedure |
| SVS | Synthetic vision system |
| TAWS | Terrain awareness system |
| TCAS | Traffic alert and collision avoidance system |
| TDP | Take-off decision point TIT Turbine inlet temperature |
| TLA | Thrust lever angle |
| TLA | Thrust lever angle |
| TLOF | Touchdown and lift-off area |
| TLS | Target level of safety |
| TODAH | Take-off distance available (helicopter) |
| TODRH | Take-off distance required (helicopter) |
| TVE | Total vertical error |
| UTC | Coordinated universal time |

| | |
|---|---|
| VD | Design diving speed |
| VS0 | Stalling speed or the minimum steady flight speed in the landing configuration |
| VFR | Visual flight rules |
| VMC | Visual meteorological conditions |
| VOR | VHF omnidirectional radio range |
| $V_{TOSS}$ | Take-off safety speed |
| $V_y$ | Best rate of climb speed |
| VSM | Vertical separation minima |
| WXR | Weather radar |

Symbols

| | |
|---|---|
| °C | Degrees Celsius |
| % | Per cent |

# SECTION 1 GENERAL

## CHAPTER 1.1 DEFINITIONS

Refer to KCASR 00 Attachment 1 (Definitions).

## CHAPTER 1.2 APPLICABILITY

The Standards contained in this Regulation KCASR 6 – Part General Aviation, shall be applicable to international general aviation operations with ~~aeroplanes~~ or helicopters as described in Section 2~~ and Section 3~~. Where the Standards apply only to aeroplanes or helicopters, this is clearly indicated. The Standards contained in this KCASR 6, Part II, Section 3 are applicable to international general aviation operations with large and turbojet aeroplanes only.

**Note 1**.— Standards Practices applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations are to be found in KCASR 6, Part CAT.

**Note 2**.— Standards Practices applicable to international commercial air transport operations ~~or international general aviation operations~~ with helicopters are to be found in KCASR 6, Part CAT.

~~**Note 3**.— Section 2 of KCASR 6 – Part General Aviation, applies to all international general aviation aeroplane operations, including those covered in Section 3. Section 3 adds additional requirements for large aeroplanes, turbojet aeroplanes and corporate aviation operations.~~

# SECTION 2 GENERAL AVIATION OPERATIONS

## CHAPTER 2.1 GENERAL

***Note 1.*** *While the Convention on International Civil Aviation assigns certain responsibilities to the State of Registry (Kuwait in this case), Resolution A23-13 of the Assembly acknowledges that the state of Registry might be unable to fully discharge these responsibilities in situations where registered aircraft are leased, chartered, or interchanged – particularly without crew – by an operator from another State. State of Kuwait may invoke KCASR 00 Article 20 (Bis 83) to address this issue.*

***Note 2****. In the case of international operations effected jointly with aeroplanes aircraft, not all of which are registered in the state of Kuwait, nothing in this Part prevents the State of Kuwait entering into an agreement for the joint exercise of the functions placed upon the State of Registry by the provisions of the relevant KCASR.*

***Note 3****. Unless specifically noted, all references to "aircraft" apply to aeroplanes and helicopters. Any provisions within this section that apply specifically to an aeroplane or a helicopter are annotated as such.*

***Note 4****. All references to aerodromes apply to aircraft, while references to heliports and landing locations apply only to helicopters.*

### 2.1.1 Compliance with laws, regulations and procedures

2.1.1.1 The pilot-in-command shall comply with the laws, regulations and procedures of those States in which operations are conducted.

2.1.1.2 The pilot-in-command shall be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the areas to be traversed, the aerodromes, heliports or landing locations to be used and the air navigation facilities relating thereto. The pilot-in-command shall ensure that other members of the flight crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the aeroplane.

***Note 1.*** *Compliance with more restrictive measures, not in contravention of the provisions of 2.1.1.1, may be required by the State of Registry.*

***Note 2.*** *Rules covering flight over the high seas are contained in KCASR 2*

***Note 3.*** *Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.*

2.1.1.3 The pilot-in-command shall have responsibility for operational control.

***Note****. The rights and obligations of a State with respect to the operation of ~~aeroplanes~~ aircraft registered in that State are not affected by this provision.*

2.1.1.4 If an emergency situation which endangers the safety or security of the ~~aeroplane~~ aircraft or persons necessitates the taking of action which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the Kuwait ~~DGCA~~CAA. Such reports shall be submitted as soon as possible and normally within ten days.

2.1.1.5 The pilot-in-command should have available on board the aircraft ~~aeroplane~~ the essential information concerning the search and rescue services in the area over which the aircraft ~~aeroplane~~ will be flown.

2.1.1.6 The pilot-in-command shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in KCASR 1.

**2.1.2 Dangerous goods**

2.1.2.1 General applicability

***Note 1.*** *Provisions for carriage of dangerous goods are contained in KCASR 18.*

***Note 2****. Article 35 of the Convention refers to certain classes of cargo restrictions.*

***Note 3****. Due to the differences in the type of operations carried out by helicopters, compared with aeroplanes, some additional considerations need to be made when dangerous goods are carried by helicopter, as described in Helicopter Operations in the Technical Instruction for the Safe Transport of Dangerous Goods by Air (Doc 9284), Part 7;7.1.1.*

2.1.2.2 Applicability for helicopters

**2.1.2.2.1 The provisions of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284) also apply to the acceptance for carriage, loading and carriage of dangerous goods in any general aviation helicopter.**

**2.1.2.2.2 Exceptions. The General exceptions contained in Part 1;1.1.5 of the Technical Instructions and the exceptions contained in Part 1;2.2 of the Technical Instructions also apply to any general aviation helicopter.**

**2.1.3 Use of psychoactive substances**

**Note**. Provisions concerning the use of psychoactive substances are contained in KCASR 1 Part MED.

**2.1.4 Specific approvals**

The pilot-in-command shall not conduct operations for which a specific approval is required unless such approval has been issued by the Kuwait DGCA. Specific approvals shall follow the layout and contain at least the information listed in Appendix 2.4.

# CHAPTER 2.2 FLIGHT OPERATIONS

## 2.2.1 Operating facilities

2.2.1.1 The pilot-in-command shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the ~~aeroplane~~aircraft, are adequate for the type of operation under which the flight is to be conducted.

**Note**. "Reasonable means" in this Standard is intended to denote the use, at the point of departure, of information available to the pilot-in-command either through official information published by the aeronautical information services or readily obtainable from other sources.

2.2.1.2 The pilot-in-command, in making a decision on the adequacy of facilities and services available at an aerodrome of intended operation, should assess the level of safety risk associated with the aircraft type and nature of the operation, in relation to the availability of rescue and firefighting services (RFFS).

## 2.2.2 Operational management

2.2.2.1 For aeroplanes — Operating instructions — General

An aeroplane shall not be taxied on the movement area of an aerodrome unless the person at the controls is an appropriately qualified pilot or:

a) Has been duly authorized by the owner or in the case where it is leased the lessee, or a designated agent;

b) Is fully competent to taxi the aeroplane;

c) Is qualified to use the radio if radio communications are required; and

d) Has received instruction from a competent person in respect of aerodrome layout, and where appropriate, information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

2.2.2.2 For helicopters — Operating instructions — general

A helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.

2.2.2.~~2~~ 3 ~~Aerodrome~~ Operating Minima

***Note**. Reference to operating minima in this section refers to aerodrome operating minima and heliport operating minima.*

2.2.2.~~2~~3.1 The pilot-in-command shall establish ~~aerodrome~~ operating minima in accordance with criteria specified by Kuwait ~~DGCA~~CAA, for each aerodrome, heliport or landing location to be used in operations. When establishing aerodrome operating minima, any conditions That may be prescribed in the list of specific approvals shall be observed. Such minima shall not be lower than any that may be established ~~for such aerodromes~~ by the State of the Aerodrome, except when specifically approved by that State.

***Note**. This Standard does not require the State of the Aerodrome to establish ~~aerodrome~~ operating minima.*

2.2.2.~~2~~3.1.1 Kuwait DGCA shall authorize operational credit(s) for operations with advanced aircraft. Where the operational credit relates to low visibility operations, Kuwait DGCA shall issue a specific approval. Such authorizations shall not affect the classification of the instrument approach procedure.

***Note 1**. Operational credit includes:*

*a) for the purposes of an approach ban (2.2.4.1.2) or dispatch considerations, a minimum below the ~~aerodrome~~ operating minima;*

*b) reducing or satisfying the visibility requirements; or*

*c) requiring fewer ground facilities as compensated for by airborne capabilities.*

***Note 2**. Guidance on operational credit and how to express the operational credit in the specific approvals template is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

***Note 3**. Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

2.2.2.3~~2~~.1.2 When issuing a specific approval for the operational credit, the Kuwait DGCA shall ensure that the:

a) ~~aeroplane~~ aircraft meets the appropriate airworthiness certification requirements;

b) information necessary to support effective crew tasks for the operation is appropriately available to both pilots where the number of flight crew members specified in the operations manual (or other documents associated with the certificate of airworthiness) is more than one;

c) operator/owner has carried out a safety risk assessment of the operations supported by the equipment;

d) operator/owner has established and documented normal and abnormal procedures and MEL;

e) operator/owner has established a training programme for the flight crew members and relevant personnel involved in the flight preparation;

f) operator/owner has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and

g) operator/owner has instituted appropriate procedures with respect to continuing

airworthiness (maintenance and repair) practices and programmes.

***Note 1****. Guidance on safety risk assessments is contained in the ICAO Safety Management Manual (Doc 9859).*

***Note 2****. Guidance on operational approvals is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

2.2.2.~~2~~3.1.3 For operations with operational credit with minima above those related to low visibility operations, the State of Registry shall establish criteria for the safe operation of the aircraft.~~aeroplane~~.

***Note.*** *Guidance on operational credit for operations with minima above those related to low visibility operations is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

2.2.2.~~2~~3.2 Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and

b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:

1) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

2) Category II (CAT II): a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m;

3) Category III (CAT III): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range less than 300 m or no runway visual range limitations;

***Note 1.*** *Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT III but with an RVR in the range of CAT III would be considered a CAT III operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.*

***Note 2.*** *The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach operation, the required visual reference is the runway environment.*

***Note 3.*** *Guidance on approach classification as it relates to instrument approach operations, procedures, runways and navigation systems is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

2.2.2.~~2~~3.3 The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, if necessary, cloud conditions.

***Note.*** *For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168), Volume I, Part II, Section 5.*

2.2.2.~~2~~3.4 The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.

2.2.2.~~2~~3.5 The Kuwait DGCA shall issue a specific approval for instrument approach operations in low visibility which shall only be conducted when RVR information is provided.

***Note.*** *Guidance on low visibility operations is contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

2.2.2.~~2~~3.6 For take-off in low visibility, the State of Registry shall issue a specific approval for the minimum take-off RVR.

***Note.*** *In general, visibility for take-off is defined in terms of RVR. An equivalent horizontal visibility may also be used.*

2.2.2.4 Briefings

2.2.2.4~~3~~.1 The pilot-in-command shall ensure that crew members and passengers are made familiar with the location and use of:

a) seat belts or harnesses as appropriate;

b) emergency exits;

c) life jackets, if the carriage of life jackets is prescribed;

d) oxygen dispensing equipment if the use of oxygen is anticipated; and

e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

2.2.2.~~3~~4.2 The pilot-in-command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

2.2.2.~~3~~4.3 In an emergency during flight, the pilot-in-command shall ensure that passengers are instructed in such emergency action as may be appropriate to the circumstances.

2.2.2.~~3~~4.4 The pilot-in-command shall ensure that, during take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board an aircraft ~~aeroplane~~ shall be secured in their seats by means of the seat belts or harnesses provided.

**2.2.3 Flight preparation**

2.2.3.1 A flight shall not be commenced until the pilot-in-command is satisfied that:

a) the aircraft ~~aeroplane~~ is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the aircraft~~aeroplane~~;

b) the instruments and equipment installed in the aircraft ~~aeroplane~~ are appropriate, taking into account the expected flight conditions;

c) any necessary maintenance has been performed in accordance with Chapter 2.6;

d) the mass of the aircraft ~~aeroplane~~ and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;

e) any load carried is properly distributed and safely secured; and

f) the aircraft ~~aeroplane~~ operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.

2.2.3.2 The pilot-in-command should have sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

2.2.3.3 Flight planning

Before commencing a flight, the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under the instrument flight rules, shall include:

a) A study of available current weather reports and forecasts; and

b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

***Note 1.*** *It is the practice in some States to declare, for flight planning purposes, higher minima for an aerodrome or heliport when nominated as an alternate, than for the same aerodrome or heliport when planned as that of intended landing.*

***Note 2****. The requirements for flight plans are contained in KCASR 2 — Rules of the Air and the procedures relating to flight plans and associated services are contained in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444).*

***Note 3****. Detailed guidance on the use of the FF-ICE services, including the use of a preliminary flight plan, can be found in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (Doc 9965).*

2.2.3.4 Meteorological conditions – visual flight rules

2.2.3.4.1 A flight to be conducted in accordance with VFR shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these rules.

2.2.3.5 Meteorological conditions – instrument flight rules – aeroplanes

2.2.3.4~~5~~.~~2~~ 1 A flight to be conducted in accordance with the instrument flight rules shall not:

a) take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the aerodrome operating minima for that operation; and

b) take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with

2.2.3.5, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the aerodrome operating minima for that operation.

2.2.3.45.3 2 The State of Registry shall establish criteria to be used for the estimated time of use of an aerodrome including a margin of time.

***Note**. A widely accepted time margin for "estimated time of use" is one hour before and after the earliest and latest time of arrival. Additional considerations can be found in the ICAO Flight Planning and Fuel Management (FPFM) Manual (Doc 9976).*

2.2.3.6 Meteorological conditions – instrument flight rules – helicopters

2.2.3.6.1 When an alternate is required. A flight to be conducted in accordance with IFR shall not be commenced unless the available information indicates that conditions at the heliport of intended landing and at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

***Note**. It is the practice in some States to declare, for flight planning purposes, higher minima for a heliport when nominated as an alternate than for the same heliport when planned as that of intended landing.*

2.2.3.6.2 When no alternate is required. A flight to be conducted in accordance with IFR to a heliport when no alternate heliport is required shall not be commenced unless available current meteorological

information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival, or from the actual time of departure to two hours after the estimated time of arrival, whichever is the shorter period:

a) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and

b) visibility of at least 1.5 km more than the minimum associated with the procedure.

***Note**. These are considered as minimum values where a reliable and continuous meteorological watch is maintained. When only an "area" type forecast is available these values may need to be increased accordingly.*

2.2.3.7 Flight in icing conditions

2.2.3.74.14 A flight to be operated in known or expected icing conditions shall not be commenced unless the aircraft ~~aeroplane~~ is certificated and equipped to cope with such conditions.

2.2.3.74.25 A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off unless the aircraft ~~aeroplane~~ has been inspected for icing and, if necessary, has been given appropriate de-icing/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the aircraft ~~aeroplane~~ is kept in an airworthy condition prior to take-off.

***Note**. Guidance material for aeroplanes is given in the ICAO Manual of Aircraft Ground De-icing/Anti-icing Operations (Doc 9640). Helicopter information is provided in the original equipment manufacturer (OEM) recommended practices.*

2.2.3.~~5~~ 8 Alternate aerodromes and heliports

~~Destination alternate aerodromes~~

2.2.3.8.1 For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome or heliport shall be selected and specified in the flight plans, unless:

2.2.3.8.1.1 For aeroplanes:

a) the duration of the flight from the departure aerodrome, or from the point of in-flight re-planning, to the destination aerodrome is such that, taking into account all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a reasonable certainty exists that:

1) the approach and landing may be made under visual meteorological conditions; and

2) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure; or

b) the aerodrome of intended landing is isolated and:

1) a standard instrument approach procedure is prescribed for the aerodrome of intended landing;

2) a point of no return has been determined; and

3) a flight shall not be continued past the point of no return unless available current meteorological information indicates that the following meteorological conditions will exist at the estimated time of use:

i) a cloud base of at least 300 m (1 000 ft) above the minimum associated with the instrument approach procedure; and

ii) visibility of at least 5.5 km (3 NM) or of 4 km (2 NM) more than the minimum associated with the instrument approach procedure.

***Note**. Separate runways are two or more runways at the same aerodrome configured such that if one runway is closed, operations to the other runway(s) can be conducted.*

2.2.3.8.1.2 For Helicopters:

a) the weather conditions in 2.2.3.6.2 prevail; or

b) 1) the heliport or landing location of intended landing is isolated and no alternate heliport or landing location is available; and

2) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and

3) a point of no return (PNR) is determined in case of an offshore destination.

2.2.3.8.2 For helicopters – Suitable offshore alternates may be specified subject to the following:

a) the offshore alternates shall be used only after passing a PNR. Prior to a PNR, onshore alternates shall be used;

b) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate;

c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate;

d) to the extent possible, deck availability shall be guaranteed; and

e) weather information must be reliable and accurate.

***Note**. The landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports.*

2.2.3.8.3 For helicopters – Offshore alternates should not be used when it is possible to carry enough fuel to have an onshore alternate. Offshore alternates should not be used in a hostile environment.

2.2.3.~~6~~ 9 Fuel and oil requirements

2.2.3.~~6~~9.1 A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aircraft ~~aeroplane~~ carries sufficient fuel and oil to ensure that it can safely complete the flight.

2.2.3.9.2 For aeroplanes,The amount of fuel to be carried must permit:

a) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is not required in accordance with 2.2.3.~~5~~8, or when the flight is to an isolated aerodrome, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 45 minutes at normal cruising altitude; or

b) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is required, flight to the aerodrome of intended landing, then to an alternate aerodrome, and after that, have a final reserve fuel for at least 45 minutes at normal cruising altitude; or

c) when the flight is conducted in accordance with day VFR, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 30 minutes at normal cruising altitude; or

d) when the flight is conducted in accordance with night VFR, flight to the aerodrome of intended landing and thereafter have a final reserve fuel for at least 45 minutes at normal cruising altitude.

***Note 1.** Nothing in 2.2.3.~~6~~ 9 precludes amendment of a flight plan in flight in order to re-plan the flight to another aerodrome, provided that the requirements of 2.2.3.~~6~~ 9 can be complied with from the point where the flight is re-planned.*

***Note 2**. Guidance on planning operations to isolated aerodromes is contained in the ICAO Flight Planning and Fuel Management (FPFM) Manual (Doc 9976).*

2.2.3.9.3 For helicopters — VFR operations. The fuel and oil carried in order to comply with 2.2.3.9.1 shall, in the case of VFR operations, be at least the amount to allow the helicopter to:

a) fly to the heliport or landing location to which the flight is planned;

b) have a final reserve fuel to fly thereafter for a period of 20 minutes at best-range speed; and

c) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies, as determined by the State of Registry and specified in the State regulations governing general aviation.

2.2.3.9.4 For helicopters — IFR operations. The fuel and oil carried in order to comply with 2.2.3.9.1 shall, in the case of IFR operations, be at least the amount to allow the helicopter to comply with 2.2.3.9.4.1, 2.2.3.9.4.2 or 2.2.3.9.4.3 as appropriate.

2.2.3.9.4.1 When no alternate is required, in terms of 2.2.3.6.2, to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:

a) a final reserve fuel to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport or landing location under standard temperature conditions and approach and land; and

b) an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.

2.2.3.9.4.2 When an alternate is required, in terms of 2.2.3.6.1, to fly to and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned, and thereafter:

a) fly to and execute an approach at the alternate specified in the flight plan; and

b) have a final reserve fuel to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and

d) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.

2.2.3.9.4.3 When no alternate heliport or landing location is available (that is, the heliport or landing location of intended landing is isolated and no alternate is available), to fly to the heliport or landing location to which the flight is planned and thereafter for a period as specified by the State of Registry.

2.2.3.9.5 For helicopters — In computing the fuel and oil required in 2.2.3.9.1, at least the following shall be considered:

a) meteorological conditions forecast;

b) expected air traffic control routings and traffic delays;

c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

d) the procedures for loss of pressurization, where applicable, or failure of one engine while en-route; and

e) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

*Note. Nothing in 2.2.3.9 precludes amendment of a flight plan in flight in order to replan the flight to another heliport, provided that the requirements of 2.2.3.9 can be complied with from the point where the flight has been replanned.*

2.2.3.~~6~~9.6~~2~~ The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.

2.2.3.~~7~~ 10 Refuelling with passengers on board

2.2.3.7.1 An aircraft ~~aeroplane~~ should not be refuelled when passengers are embarking, on board or disembarking (or, for helicopters, when rotors are turning) unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the aircraft ~~aeroplane~~ by the most practical and expeditious means available.

2.2.3.~~7~~10.2 When refuelling with passengers embarking, on board or disembarking, two-way communications should be maintained by the aircraft's~~aeroplane's~~ intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by 2.2.3.~~7~~10.1.

***Note 1.*** *The provisions of 2.2.3.~~7~~10.1 do not necessarily require the deployment of integral aircraft ~~aeroplane~~ stairs or the opening of emergency exits as a prerequisite to refuelling.*

***Note 2.*** *Provisions concerning aircraft refuelling are contained in KCASR 14, Volume I, and guidance on safe refuelling practices is contained in the ICAO Airport Services Manual (Doc 9137), Parts 1 and 8 and in the Heliport Manual (Doc 9261).*

***Note 3.*** *Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

2.2.3.~~8~~ 11 Oxygen supply

The pilot-in-command shall ensure that breathing oxygen is available to crew members and passengers in sufficient quantities for all flights at such altitudes where a lack of oxygen might result in impairment of the faculties of crew members or harmfully affect passengers.

*Note 1. Guidance on the carriage and use of oxygen is given in Attachment 2.A.*

*Note 2. Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text of Attachment 2.A are as follows:*

| *Absolute pressure* | *Metres* | *Feet* |
|---|---|---|
| 700 hPa | 3 000 | 10 000 |
| 620 hPa | 4 000 | 13 000 |
| 376 hPa | 7 600 | 25 000 |

**2.2.4 In-flight procedures**

2.2.4.1 ~~Aerodrome operating~~ Operating minima

2.2.4.1.1 A flight shall not be continued towards the aerodrome or heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that aerodrome or heliport or at least one destination alternate aerodrome or heliport, in compliance with the operating minima established in accordance with 2.2.2.~~2~~3.

2.2.4.1.2 An instrument approach shall not be continued below 300 m (1 000 ft) above the aerodrome or heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome or heliport operating minima.

***Note**. Criteria for the final approach segment is contained in PANS-OPS (Doc 8168), Volume II.*

2.2.4.1.3 If, after entering the final approach segment or after descending below 300 m (1 000 ft) above the aerodrome or heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an ~~aeroplane~~ aircraft shall not continue its approach-to-land beyond a point at which the limits of the aerodrome or heliport operating minima would be infringed.

***Note**. Controlling RVR means the reported values of one or more RVR reporting locations (touchdown, midpoint and stop-end) used to determine whether operating minima are or are not met. Where RVR is used, the controlling RVR is the touchdown RVR, unless otherwise specified by State criteria.*

2.2.4.2 Meteorological and operational observations by pilots

2.2.4.2.1 When meteorological conditions likely to affect the safety of other aircraft are encountered, they should be reported as soon as possible.

***Note**. The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in KCASR 3, the PANS-ATM (Doc 4444) the PANS-MET (Doc 10157) and the ICAO appropriate Regional Supplementary Procedures (Doc 7030).*

2.2.4.2.2 For aeroplanes t~~T~~he pilot-in-command should report runway braking action when the runway braking action encountered is not as good as reported.

***Note**. The procedures for making special air-reports regarding runway braking action are contained in the PANS-ATM (Doc 4444), Chapter 4, and Appendix 1.*

2.2.4.3 Hazardous flight conditions

Hazardous flight conditions encountered, other than those associated with meteorological conditions, should be reported to the appropriate aeronautical station as soon as possible. The reports so rendered should give such details as may be pertinent to the safety of other aircraft.

2.2.4.4 Aeroplane operating procedures for landing performance

An approach to land should not be continued below 300 m (1 000 ft) above aerodrome elevation unless the pilot-in-command is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

***Note 1.*** *The procedures for using runway surface condition information on board aircraft are contained in the PANS Aerodromes (Doc 9981) and in the performance section of the aeroplane flight manual; and for aeroplanes certificated in accordance with KCASR 8, in the ICAO Aeroplane Performance Manual (Doc 10064).*

***Note 2.*** *Guidance on development of aeroplane performance information for aeroplanes certificated in accordance with KCASR 8, is contained in the ICAO Aeroplane Performance Manual (Doc 10064).*

2.2.4.5 Flight crew members at duty stations

2.2.4.5.1 Take-off and landing. All flight crew members required to be on flight deck duty shall be at their stations.

2.2.4.5.2 En route. All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aircraft ~~aeroplane~~ or for physiological needs.

2.2.4.5.3 Seat belts. All flight crew members shall keep their seat belts fastened when at their stations.

2.2.4.5.4 Safety harness. When safety harnesses are provided, any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases; all other flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

***Note****. Safety harness includes shoulder strap(s) and a seat belt which may be used independently.*

2.2.4.6 Use of oxygen

All flight crew members, when engaged in performing duties essential to the safe operation of an aircraft ~~aeroplane~~ in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been prescribed in 2.2.3.~~8~~11.

2.2.4.7 Safeguarding of cabin crew and passengers in pressurized aircraft ~~aeroplanes~~ in the event of loss of pressurization, Cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurization and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.

***Note**. It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurization.*

2.2.4.8 In-flight fuel management

2.2.4.8.1 The pilot-in-command shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to an aerodrome, heliport or landing location where a safe landing can be made with the planned final reserve fuel remaining.

***Note**. The protection of final reserve fuel is intended to ensure safe landing at any aerodrome, heliport or landing location when unforeseen occurrences may not permit a safe completion of an operation as originally planned.*

2.2.4.8.2 The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, heliport or landing location the pilot calculates that any change to the existing clearance to that aerodrome, heliport or landing location, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

***Note 1**. The declaration of MINIMUM FUEL informs ATC that all planned ~~aerodrome~~ options have been reduced to a specific aerodrome, heliport or landing location of intended landing (and, for helicopters, that no precautionary landing location is available) and any change to the existing clearance, or air traffic delays, may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.*

***Note 2.** For helicopters, a precautionary landing location refers to a landing location, other than the location of intended landing, where it is expected that a safe landing can be made prior to the consumption of the planned final reserve fuel.*

2.2.4.8.3 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the calculated usable fuel estimated to be available upon landing at the nearest aerodrome, heliport or landing location where a safe landing can be made is less than the planned final reserve fuel.

***Note 1.** The planned final reserve fuel refers to the value calculated in 2.2.3.~~6~~ 9 and is the minimum amount of fuel required upon landing at any aerodrome, heliport or landing location.*

***Note 2**. For helicopters, the pilot estimates with reasonable certainty that the fuel remaining upon landing at the nearest safe landing location will be less than the final reserve fuel taking into consideration the latest information available to the pilot, the area to be overflown (i.e. with respect to the availability of precautionary landing locations), meteorological conditions and other reasonable contingencies.*

***Note ~~2~~3.** The words "MAYDAY FUEL" describe the nature of the distress conditions as required in KCASR 10, Volume II, 5.3.2.1.1, b) 3).*

2.2.4.9 Instrument approach procedures

2.2.4.9.1 One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by the State in which the aerodrome, or heliport or landing location is located, or by the State which is responsible for the heliport when located outside the territory of any State, to serve each instrument runway, FATO ~~or~~ aerodrome, heliport or landing location utilized for instrument flight operations.

2.2.4.9.2 Aircraft ~~Aeroplanes~~ operated in accordance with the instrument flight rules shall comply with

the instrument approach procedures approved by the State of the Aerodrome, or by the State which is responsible for the heliport when located outside the territory of any State ~~in which the aerodrome is located~~.

***Note 1**. See 2.2.2.~~2~~3.~~1~~ 2 for instrument approach operation classifications.*

***Note 2**. Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS, Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS, Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see 2.1.1.1).*

### 2.2.5 Duties of pilot-in-command

2.2.5.1 The pilot-in-command shall be responsible for the operation, safety and security of the aircraft ~~aeroplane~~ and the safety of all crew members, passengers and cargo on board.

2.2.5.2 The pilot-in-command shall be responsible for ensuring that a flight:

a) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of any psychoactive substance; and

b) will not be continued beyond the nearest suitable aerodrome, heliport or landing location when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen.

2.2.5.3 The pilot-in-command shall be responsible for notifying the nearest appropriate authority and Kuwait ~~DGCA~~ CAA by the quickest available means of any accident involving the aircraft~~aeroplane~~, resulting in serious injury or death of any person or substantial damage to the aircraft ~~aeroplane~~ or property.

***Note**. A definition and examples of the term "serious injury" is contained in KCASR 00 and KCASR 13.*

### 2.2.6 Cabin baggage (take-off and landing)

The pilot-in-command shall ensure that all baggage carried onto an aircraft ~~aeroplane~~ and taken into the passenger cabin is securely stowed.

### 2.2.7 Helicopter over-water flights

All helicopters on flights over water in a hostile environment in accordance with Chapter 2.4, 2.4.4.4 shall be certificated for ditching. Sea state shall be an integral part of ditching information.

## CHAPTER 2.3 AIRCRAFT ~~AEROPLANE~~ PERFORMANCE OPERATING LIMITATIONS

### 2.3.1 General

2.3.1.1 An aircraft ~~aeroplane~~ shall be operated:

a) in compliance with the terms of its airworthiness certificate or equivalent approved document;

b) within the operating limitations prescribed by the certification provided by Kuwait DGCA; and

c) if applicable, within the mass limitations imposed by compliance with the applicable noise certification Standards in KCASR 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain aerodrome, heliport or landing location or a runway where there is no noise disturbance problem, by ~~the competent authority of~~ the State ~~in which the aerodrome is situated~~of the Aerodrome..

2.3.1.2 Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the certification provided by Kuwait DGCA for visual presentation, shall be displayed in the aircraft~~aeroplane~~.

***Note.*** *The Standards of KCASR 8, apply to all helicopters intended for the carriage of passengers or cargo or mail in international air navigation.*

2.3.1.3 Where helicopters are operating to or from heliports in a congested hostile environment, the State in which the heliport is situated shall take such precautions as are necessary to control the risk associated with an engine failure.

***Note.*** *Guidance is provided in the Helicopter Code of Performance Development Manual (Doc 10110).*

2.3.1.~~3~~ 4 The pilot-in-command shall determine that aeroplane performance will permit the take-off and departure to be carried out safely.

## CHAPTER 2.4 AIRCRAFT ~~AEROPLANE~~ INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

*Note. Specifications for the provision of aircraft ~~aeroplane~~ communication and navigation equipment are contained in Chapter 2.5.*

### 2.4.1 General

In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in aircraft ~~aeroplanes~~ according to the aircraft ~~aeroplane~~ used and to the circumstances under which the flight is to be conducted. The prescribed instruments and equipment, including their installation, shall be approved or accepted ~~acceptable~~by to the State of Registry.

### 2.4.2 Aircraft ~~Aeroplanes~~ on all flights

2.4.2.1 An aircraft ~~aeroplane~~ shall be equipped with instruments which will enable the flight crew to control the flight path of the aircraft~~aeroplane~~, carry out any required procedural manoeuvres and observe the operating limitations of the aircraft ~~aeroplane~~ in the expected operating conditions.

2.4.2.2 An aircraft ~~aeroplane~~ shall be equipped with or carry on board:

a) an accessible first-aid kit;

b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aircraft~~aeroplane~~. At least one shall be located in:

1) the pilot's compartment; and

2) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew;

***Note**. Refer to 2.4.2.3 for fire extinguishing agents.*

c) 1) a seat or berth for each person over 2 year of age; and

2) a seat belt for each seat and restraining belts for each berth;

d) the following manuals, charts and information:

1) the flight manual or other documents or information concerning any operating limitations prescribed for the aircraft by the certificating authority of the State of Registry~~aeroplane~~ as required for the application of Chapter 2.3;

2) any specific approval issued by the Kuwait DGCA, if applicable, for the operation(s) to be conducted;

3) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;

4) procedures, as prescribed in KCASR 2, for pilots-in-command of intercepted aircraft;

5) visual signals for use by intercepting and intercepted aircraft, as contained in KCASR 2; and

6) the journey log book for the aircraft~~aeroplane~~;

e) where the aircraft ~~aeroplane~~ is fitted with fuses that are accessible in flight, spare electrical fuses of appropriate ratings for replacement of those fuses.

2.4.2.3 Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aircraft, ~~aeroplane~~ for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in an aircraft, ~~aeroplane~~ for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

a) meet the applicable minimum performance requirements of Kuwait DGCA; and

b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex A, Group II.

***Note**. Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 — New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.*

2.4.2.4 Aircraft ~~Aeroplanes~~ on all flights should be equipped with the ground-air signal codes for search and rescue purposes.

2.4.2.5 Aircraft ~~Aeroplanes~~ on all flights shall be equipped with a safety harness for each flight crew member seat.

***Note**. Safety harness includes shoulder strap(s) and a seat belt which may be used independently.*

2.4.2.6 Marking of break-in points

2.4.2.6.1 If areas of the fuselage suitable for break-in by rescue crews in emergency are marked on an aircraft, ~~aeroplane~~ such areas shall be marked as shown below (see F~~f~~igure ~~following~~2.4-1). The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background.

2.4.2.6.2 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.

***Note**. This Standard does not require any aircraft ~~aeroplane~~ to have break-in areas.*

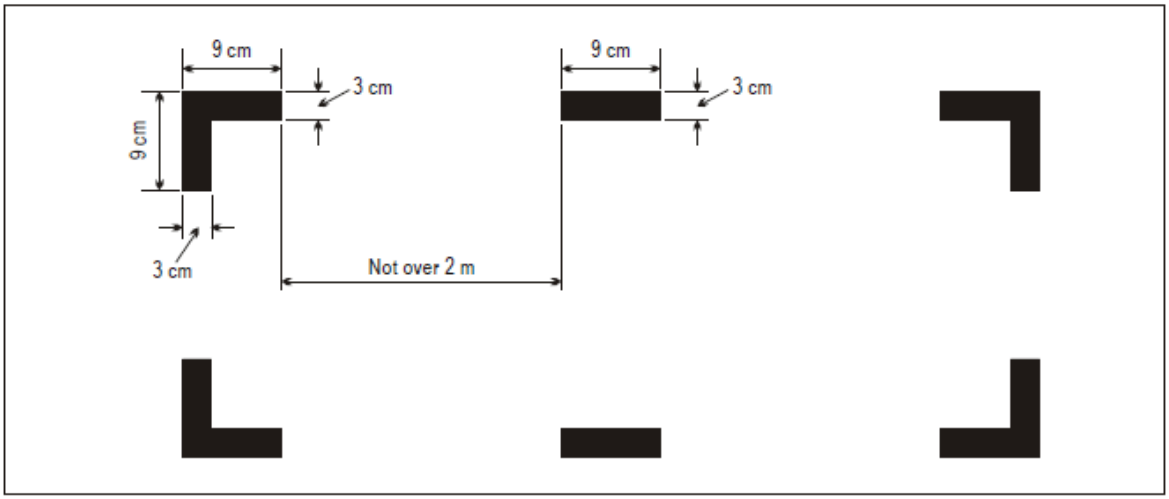



Figure 2.4-1. MARKING OF BREAK-IN POINTS (see 2.4.2.6)

**2.4.3 All aircraft ~~aeroplanes~~ operated as VFR flights**

2.4.3.1 All aircraft ~~aeroplanes~~ when operated as VFR flights shall be:

a) equipped with a means of measuring and displaying:

1) magnetic heading;

2) barometric altitude;

3) indicated airspeed;

b) equipped with, or shall carry, a means of measuring and displaying time in hours, minutes and seconds; and

c) equipped with such additional equipment as may be prescribed by the manufacturer, state of manufacturer and Kuwait DGCA.

2.4.3.2 For aeroplanes VFR flights which are operated as controlled flights should be equipped in accordance with 2.4.7.

**2.4.4 Aircraft ~~Aeroplanes~~ on flights over water**

2.4.4.1 Seaplanes

Seaplanes for all flights shall be equipped with:

a) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position readily accessible from the seat or berth;

b) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable;

c) one anchor; and

d) one sea anchor (drogue), when necessary to assist in manoeuvring.

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

2.4.4.2 Landplanes

Single-engined landplanes

All single-engined landplanes:

a) when flying en route over water beyond gliding distance from the shore; or

b) when taking off or landing at an aerodrome where, in the opinion of the pilot-in-command, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching; should carry one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

***Note**. "Landplanes" includes amphibians operated as landplanes.*

2.4.4.3 Aeroplanes on extended flights over water

2.4.4.3.1 All aeroplanes operated on extended flights over water shall be equipped with, at a minimum, one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

2.4.4.3.2 The pilot-in-command of an aeroplane operated on an extended flight over water shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching. The pilot-in-command shall take into account the operating environment and conditions such as, but not limited to, sea state and sea and air temperatures, the distance from land suitable for making an emergency landing, and the availability of search and rescue facilities. Based upon the assessment of these risks, the pilot-in-command shall, in addition to the equipment required in 2.4.4.3.1, ensure that the aeroplane is equipped with:

a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and

b) equipment for making the distress signals described in KCASR 2.

2.4.4.4 Helicopters on flights over water

2.4.4.4.1 Means of flotation

All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of flotation to ensure a safe ditching of the helicopter when:

a) engaged in offshore operations or other over-water operations, as prescribed by the State of Registry; or

b) flying at a distance from land specified by the appropriate State authority.

***Note**. When determining the distance from land referred to in 2.4.4.4.1, environmental conditions and the availability of search and rescue facilities are considered.*

2.4.4.4.2 Emergency equipment

2.4.4.4.2.1 Helicopters operating in accordance with the provisions in 2.4.4.4.1 shall be equipped with:

a) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat of the person for whose use it is provided;

b) when not precluded by consideration related to the type of helicopter used, life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken; and

c) equipment for making the pyrotechnical distress signals described in Annex 2.

2.4.4.4.2.2 When taking off or landing at a heliport where, in the opinion of the State of Registry, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in 2.4.4.4.2.1 a) shall be carried.

2.4.4.4.2.3 Each life jacket and equivalent individual flotation device, when carried in accordance with 2.4.4.4, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

2.4.4.4.2.4 On any helicopter for which the individual certificate of airworthiness is first issued on or after 1 January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of 2.4.4.4.2 should be deployable by remote control.

2.4.4.4.2.5 Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically-assisted deployment.

2.4.4.4.2.6 On any helicopter for which the individual certificate of airworthiness was first issued before 1 January 1991, the provisions of 2.4.4.4.2.4 and 2.4.4.4.2.5 should be complied with no later than 31 December 1992.

### 2.4.5 Aircraft ~~Aeroplanes~~ on flights over designated land areas

Aeroplanes, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

### 2.4.6 Aircraft ~~Aeroplanes~~ on high altitude flights

2.4.6.1 Aircraft ~~Aeroplanes~~ intended to be operated at high altitudes shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 2.2.3.11~~8~~.

2.4.6.2 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1990 Pressurized aeroplanes intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa shall be equipped with a device to provide positive

warning to the flight crew of any dangerous loss of pressurization.

2.4.6.3 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1990

Pressurized aeroplanes intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa should be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

**2.4.7 All aircraft ~~aeroplanes~~ operated in accordance with the instrument flight rules**

All aircraft ~~aeroplanes~~ when operated in accordance with the instrument flight rules, or when the aircraft ~~aeroplane~~ cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be:

a) equipped with a means of measuring and displaying:

1) magnetic heading (standby compass);

2) barometric altitude;

~~2)~~ ***Note***. *Due to the long history of misreadings, the use of drum-pointer altimeters is not recommended.*

3) indicated airspeed, with a means of preventing malfunctioning due to either condensation or icing;

4) for aeroplanes, turn and slip; for helicopters, slip;

5) for aeroplanes, aircraft attitude; for helicopters, an attitude indicator for each required pilot and one additional attitude indicator;

6) stabilized aircraft heading;

***Note***. *The requirements of 4), 5) and 6) may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the three separate instruments, are retained.*

7) whether the supply of power to the gyroscopic instruments is adequate;

8) the outside air temperature;

9) rate-of-climb and descent;

b) equipped with, or shall carry, a means of measuring and displaying time in hours, minutes and seconds; and

c) equipped with such additional instruments or equipment as may be prescribed by the appropriate authority.

**2.4.8 Aircraft ~~Aeroplanes~~ when operated at night**

2.4.8.1 Aeroplanes, when operated at night, shall be equipped with:

a) the equipment specified in 2.4.7; and

b) the lights required by KCASR 2 for aircraft in flight or operating on the movement area of an aerodrome;

***Note**. Specifications for lights meeting the requirements of KCASR 2 for navigation lights are contained in Appendix 2.1. The general characteristics of lights are specified in Annex 8.*

c) a landing light;

d) illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft ~~aeroplane~~ that are used by the flight crew;

e) lights in all passenger compartments; and

f) an independent portable light for each crew member station.

2.4.8.2 Helicopters when operated at night, shall be equipped with:

a) the lights required by Annex 2 for aircraft in flight or operating on the movement area of an aerodrome or heliport;

***Note**. Specifications for lights meeting the requirements of Annex 2 for navigation lights are contained in Appendix 2.1. The general characteristics of lights are specified in Annex 8.*

b) a landing light;

c) illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft that are used by the flight crew;

d) lights in all passenger compartments;

e) an independent portable light for each crew member station; and

f) for operations in accordance with VFR;

1) the equipment specified in 2.4.3.1;

2) an attitude indicator for each required pilot;

3) a slip indicator;

4) a means of measuring and displaying stabilized aircraft heading;

5) a means of measuring and displaying rate of climb and descent; and

6) such additional instruments and equipment as may be prescribed by the appropriate authority.

2.4.8.3 For helicopters, the landing light should be trainable, at least in the vertical plane.

**2.4.9 Aircraft ~~Aeroplanes~~ complying with the noise certification Standards in KCASR 16, Volume I**

An aircraft ~~aeroplane~~ shall carry a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

***Note 1****. The attestation may be contained in any document, carried on board, approved by the State of Registry.*

***Note 2.*** *The various noise certification Standards of Annex 16, Volume I, which are applicable to helicopters, are determined according to the date of application for a Type Certificate, or the date of acceptance of an application under an equivalent prescribed procedure by the certificating authority. Some helicopters are not required to comply with any noise certification Standard. For details, see KCASR 16, Volume I, Part II, Chapters 8 and 11.*

**2.4.10 Mach number indicator**

Aeroplanes with speed limitations expressed in terms of Mach number shall be equipped with a means of displaying Mach number.

**2.4.11 Aeroplanes required to be equipped with ground proximity warning systems (GPWS)**

2.4.11.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

2.4.11.2 All turbine-engined aeroplanes of a maximum certificated take-off mass of 5700 kg or less and authorized to carry more than five but not more than nine passengers should be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

2.4.11.3 All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers should be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

2.4.11.4 A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

2.4.11.5 A ground proximity warning system shall provide, at a minimum, warnings of at least the following circumstances:

a) excessive descent rate;

b) excessive altitude loss after take-off or go-around; and

c) unsafe terrain clearance.

2.4.11.6 A ground proximity warning system should provide, as a minimum, warnings of at least the following circumstances:

a) excessive descent rate;

b) excessive terrain closure rate;

c) excessive altitude loss after take-off or go-around;

d) unsafe terrain clearance while not in landing configuration;

1) gear not locked down;

2) flaps not in a landing position; and

e) excessive descent below the instrument glide path.

2.4.11.7 A ground proximity warning system installed in turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers for which the individual certificate of airworthiness was first issued after 1 January 2011 shall provide, as a minimum, warnings of at least the following circumstances:

a) excessive descent rate;

b) excessive terrain closure rate;

c) excessive altitude loss after take-off or go-around;

d) unsafe terrain clearance while not in landing configuration;

1) gear not locked down;

2) flaps not in a landing position; and

e) excessive descent below the instrument glide path.

**2.4.12 Emergency locator transmitter (ELT)**

For aeroplanes:

2.4.12.1 All aeroplanes should carry an automatic ELT.

2.4.12.2 Except as provided for in 2.4.12.3, all aeroplanes shall be equipped with at least one ELT of any type.

2.4.12.3 All aeroplanes for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least one automatic ELT.

2.4.12.4 ELT equipment carried to satisfy the requirements of 2.4.12.1, 2.4.12.2 and 2.4.12.3 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

***Note**. The judicious choice of numbers of ELTs, their type and placement on aircraft, and associated floatable life-support systems, will ensure the greatest chance of ELT activation in the event of an accident for aircraft operating over water or land, including areas especially difficult for search and rescue. Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.*

For helicopters:

2.4.12.5 From 1 July 2008, all helicopters operating in performance Classes 1 and 2 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 2.4.4.4.1 a), with at least one automatic ELT and one ELT(S) in a raft or life jacket.

2.4.12.6 From 1 July 2008, all helicopters operating in performance Class 3 shall be equipped with at

least one automatic ELT and, when operating on flights over water as described in 2.4.4.4.1 b), with at least one automatic ELT and one ELT(S) in a raft or life jacket.

2.4.12.7 ELT equipment carried to satisfy the requirements of 2.4.12.5 and 2.4.12.6 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

**2.4.13 Aircraft ~~Aeroplanes~~ required to be equipped with a pressure-altitude reporting transponder**

2.4.13.1 Aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of KCASR 10, Volume IV.

2.4.13.2 Unless exempted by Kuwait DGCA, aeroplanes operating as VFR flights shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provision of KCASR 10, Volume IV.

2.4.13.3 Unless exempted by the appropriate authorities, all helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of KCASR 10, Volume IV.

2.4.13.4 All helicopters should be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of KCASR 10, Volume IV .

***Note**. These provisions are intended to support the effectiveness of ACAS as well as to improve the effectiveness of air* traffic services. *The intent is also for aircraft not equipped with pressure-altitude reporting transponders to be operated so as not to share airspace used by aircraft equipped with airborne collision avoidance systems. To this end, exemptions from the carriage requirement for pressure-altitude reporting transponders could be given by designating airspace where such carriage is not required.*

**2.4.14 Microphones**

2.4.14.1 For aeroplanes ~~W~~when operating under the instrument flight rules all flight crew members required to be on flight deck duty should communicate through boom or throat microphones below the transition level/altitude.

2.4.14.2 For helicopters, all flight crew members required to be on flight deck duty should communicate through boom or throat microphones.

**2.4.15 Aircraft ~~Aeroplanes~~ equipped with automatic landing systems, a head-up display (HUD) or equivalent displays, enhanced vision systems (EVS), synthetic vision systems (SVS) and/or combined vision systems (CVS)**

~~synthetic vision systems (SVS) and/or combined vision systems (CVS)~~ Notwithstanding Chapter 2.2, 2.2.2.3~~2~~.1.1 to 2.2.2.3~~2~~.1.3, where aircraft ~~aeroplanes~~ are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, criteria for the use of such systems for the safe operation of an aircraft ~~aeroplane~~ shall be established by the State of Registry.

***Note 1.** Information regarding automatic landing systems, a HUD or equivalent displays, EVS, SVS OR CVS, is*

*contained in the ICAO Manual of All-Weather Operations (Doc 9365).*

*Note 2. An automatic landing system for a helicopter is an automatic approach system using airborne systems that provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.*

### 2.4.16 Flight recorders

***Note 1.*** *Crash-protected flight recorders comprise one or more of the following:*

*— a flight data recorder (FDR),*

*— a cockpit voice recorder (CVR),*

*— an airborne image recorder (AIR),*

*— a data link recorder (DLR).*

*As per Appendix 2.3, image and data link information may be recorded on either the CVR or the FDR.*

*Note 2. For helicopters, combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements in this Annex.*

***Note 32.*** *Lightweight flight recorders comprise one or more of the following:*

*— an aircraft data recording system (ADRS),*

*— a cockpit audio recording system (CARS),*

*— an airborne image recording system (AIRS),*

*— a data link recording system (DLRS).*

*As per Appendix 2.3, image and data link information may be recorded on either the CARS or the ADRS.*

***Note 43****. Detailed requirements on flight recorders are contained in Appendix 2.3.*

***Note 54.*** *For aeroplanes for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.*

***Note 65****. For aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

***Note 76.*** *Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

***Note 87****. Section 3, Chapter 3.3, contains requirements for States regarding the use of voice, image and/or data recordings and transcripts.*

2.4.16.1 Aeroplanes, Flight data recorders and aircraft data recording systems

***Note****. Parameters to be recorded are listed in Tables A2.3-1 and A2.3-3 4 of Appendix 2.3.*

2.4.16.1.1 Applicability

2.4.16.1.1.1 All turbine-engined aeroplanes with a seating configuration of more than five passenger seats and a maximum certificated take-off mass of 5 700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 should be equipped with:

a) an FDR which should record at least the first 16 parameters in Table A2.3-1 of Appendix 2.3; or

b) a Class C AIR or AIRS which should record at least the flight path and speed parameters displayed to the pilot(s), as defined in 2.2.2 of Appendix 2.3; or

c) an ADRS which should record at least the first 7 parameters listed in Table A2.3-~~3~~ 4 of Appendix 2.3.

***Note 1.*** *AIR or AIRS classification is defined in 4.1 of Appendix 2.3.*

***Note 2.*** *"The application for type certification that is submitted to a Contracting State" refers to the date of application of the original "Type Certificate" for the aeroplane type, not the date of certification of particular aeroplane variants or derivative models.*

2.4.16.1.1.2 All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table A2.3-1 of Appendix 2.3.

2.4.16.1.1.3 All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023 should be equipped with an FDR capable of recording at least the 82 parameters listed in Table A2.3-1 of Appendix 2.3.

2.4.16.1.2 Recording technology

FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

2.4.16.1.3 Duration

All FDRs shall retain the information recorded during at least the last 25 hours of their operation.

2.4.16.2 Aeroplanes, Cockpit voice recorders and cockpit audio recording systems

2.4.16.2.1 Applicability

All turbine-engined aeroplanes with a seating configuration of more than five passenger seats and a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 and required to be operated by more than one pilot should be equipped with either a CVR or a CARS.

2.4.16.2.2 Recording technology

CVRs and CARS shall not use magnetic tape or wire.

2.4.16.2.3 Duration

2.4.16.2.3.1 All CVRs shall retain the information recorded during at least the last 2 hours of their

operation.

2.4.16.2.3.2 All aeroplanes that are required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1 January 2025, shall be equipped with a CARS which shall retain the information recorded during at least the last two hours of their operation.

2.4.16.3 Aeroplanes, Data link recorders

2.4.16.3.1 Applicability

2.4.16.3.1.1 All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3 and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder.

2.4.16.3.1.2 All aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to install and use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3, shall record the data link communications messages on a crash-protected flight recorder, unless the installed data link communications equipment is compliant with a type certificate issued or aircraft modification first approved prior to 1 January 2016.

***Note 1.*** *Refer to Table 3.C-4 in Attachment 3.C for examples of data link communication recording requirements.*

***Note 2.*** *A Class B AIR could be a means for recording data link communications applications messages to and from the aeroplanes where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.*

***Note 3.*** *The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (e.g. structural, wiring).*

2.4.16.3.1.3 All aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3 should record the data link communications messages on a crash-protected flight recorder.

2.4.16.3.2 Duration

The minimum recording duration shall be equal to the duration of the CVR.

2.4.16.3.3 Correlation

Data link recording shall be able to be correlated to the recorded cockpit audio.

2.4.16.4 Aeroplanes, Flight recorders — general

2.4.16.4.1 Construction and installation

Flight recorders shall 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. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

2.4.16.4.2 Operation

2.4.16.4.2.1 Flight recorders shall not be switched off during flight time.

2.4.16.4.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with Annex 13.

***Note 1**. The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

***Note 2.** The pilot-in-command's responsibilities regarding the retention of flight recorder records are contained in 2.4.16.4.3.*

2.4.16.4.3 Flight recorder records

The pilot-in-command, and/or the owner/operator, shall ensure, to the extent possible, in the event the aeroplane becomes

involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with KCASR 13.

2.4.16.4.4 Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

***Note**. Procedures for the inspections of the flight recorder systems are given in Appendix 2.3.*

2.4.16.4.5 Flight recorder electronic documentation

The documentation requirement concerning FDR and ADRS parameters provided by operators or owners to accident investigation authorities should be in electronic format and take account of industry specifications.

***Note**. Industry specifications for documentation concerning flight recorder parameters may be found in ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.*

2.4.16.5 Helicopters — Flight data recorders and aircraft data recording systems

***Note**. Parameters to be recorded are listed in Table A2.3-2 of Appendix 2.3.*

2.4.16.5.1 Applicability

2.4.16.5.1.1 All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with an FDR which shall record at least the first 48 parameters listed in Table A2.3-2 of Appendix 2.3.

2.4.16.5.1.2 All helicopters of a maximum certificated take-off mass of over 7 000 kg, or having a passenger seating configuration of more than 19, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, shall be equipped with an FDR which shall record at least the first 30 parameters listed in Table A2.3-2 of Appendix 2.3.

2.4.16.5.1.3 All helicopters of a maximum certificated take-off mass of over 3 175 kg up to and including 7 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with an FDR which should record at least the first 15 parameters listed in Table A2.3-2 of Appendix 2.3.

2.4.16.5.2 Recording technology

FDRs shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

2.4.16.5.3 Duration

All FDRs shall retain the information recorded during at least the last 10 hours of their operation.

2.4.16.6 Helicopters — Cockpit voice recorders and cockpit audio recording systems

2.4.16.6.1 Applicability

2.4.16.6.1.1 All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least the main rotor speed shall be recorded on the CVR.

2.4.16.6.1.2 All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least the main rotor speed should be recorded on the CVR.

2.4.16.6.2 Recording technology

CVRs shall not use magnetic tape or wire.

2.4.16.6.3 Duration

All helicopters required to be equipped with a CVR shall be equipped with a CVR which shall retain the information recorded during at least the last two hours of its operation.

2.4.16.7 Helicopters — Data link recorders

2.4.16.7.1 Applicability

2.4.16.7.1.1 All helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3 and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder.

2.4.16.7.1.2 All helicopters for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to install and use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3, shall record the data link communications messages on a crash-protected flight recorder, unless the data link communications equipment is compliant with a type certificate issued or aircraft modification first approved prior to 1 January 2016.

***Note 1.*** *Refer to Table 3.C-4 in Attachment 3.C for examples of data link communication recording requirements.*

***Note 2**. A Class B AIR could be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.*

***Note 3.** The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (that is, structural, wiring).*

2.4.16.7.1.3 All helicopters for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to in 5.1.2 of Appendix 2.3, should record the data link communications messages on a crash-protected flight recorder.

2.4.16.7.2 Duration

The minimum recording duration shall be equal to the duration of the CVR.

2.4.16.7.3 Correlation

Data link recording shall be able to be correlated to the recorded cockpit audio.

2.4.16.8 Helicopters — Flight recorders — general

2.4.16.8.1 Construction and installation

Flight recorders shall 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. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

2.4.16.8.2 Operation

2.4.16.8.2.1 Flight recorders shall not be switched off during flight time.

2.4.16.8.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with Annex 13.

***Note 1.** The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

***Note 2**. The operator or owner's responsibilities regarding the retention of flight recorder records are contained in 2.4.16.8.3*

2.4.16.8.3 Flight recorder records

The pilot-in-command, and/or the owner or operator, shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with KCASR 13.

2.4.16.8.4 Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

***Note**. Procedures for the inspections of the flight recorder systems are given in Appendix 2.3.*

2.4.16.8.5 Flight recorders electronic documentation

The documentation requirement concerning FDR parameters provided by the operator or owner to accident investigation authorities should be in electronic format and take account of industry specifications.

***Note**. Industry specification for documentation concerning flight recorder parameters may be found in ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.*

**2.4.17 Electronic flight bags (EFBs)**

***Note**. Guidance on EFB equipment, functions and specific approval is contained in the ICAO Manual on Electronic Flight Bags (EFBs) (Doc 10020).*

2.4.17.1 EFB equipment

Where portable EFBs are used on board an aircraft~~aeroplane~~, the pilot-in-command and/or the operator/owner shall ensure that they do not affect the performance of the aircraft ~~aeroplane~~ systems, equipment or the ability to operate the aircraft~~aeroplane~~.

2.4.17.2 EFB functions

2.4.17.2.1 Where EFBs are used on board an aircraft ~~aeroplane~~ the pilot-in-command and/or the owner/operator shall:

a) assess the safety risk(s) associated with each EFB function;
b) establish the procedures for the use of, and training requirements for, the device and each EFB function; and
c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

***Note.** Guidance on safety risk assessments is contained in the ICAO Safety Management Manual (SMM) (Doc 9859) and KCASR 19.*

2.4.17.2.2 The State of Registry shall issue a specific approval for the operational use of EFB functions to be used for the safe operation of aircraft~~aeroplanes~~.

~~the safe operation of aeroplanes.~~

2.4.17.3 EFB specific approval

When issuing a specific approval for the use of EFBs, Kuwait DGCA shall ensure that:

a) the EFB equipment and its associated installation hardware, including interaction with aeroplane systems if applicable, meet the appropriate airworthiness certification requirements;
b) the operator/owner has assessed the risks associated with the operations supported by the EFB function(s);
c) the operator/owner has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);
d) the operator/owner has established and documented procedures for the management of the EFB function(s) including any databases it may use; and

e) the operator/owner has established and documented the procedures for the use of, and training requirements for, the EFB function(s).

***Note**. Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).*

**2.4.18 Aircraft ~~Aeroplane~~ operated under an KCASR 00 Article 20 (83 bis) agreement**

***Note**. Guidance concerning the transfer of responsibilities by the State of Registry to the State of the principal location of a general aviation operator in accordance with Article 83 bis is contained in the Manual on the Implementation of Article 83 bis of the Convention on International Civil Aviation (Doc 10059).*

2.4.18.1 An aircraft~~aeroplane~~, when operating under an Article 83 bis agreement entered into between the State of Registry and the State of the principal location of a general aviation operator, shall carry a certified true copy of the agreement summary, in either an electronic or hard copy format. When the summary is issued in a language other than English, an English translation shall be included.

***Note**. Guidance regarding the agreement summary is contained in the ICAO Doc 10059.*

2.4.18.2 The agreement summary of an Article 83 bis agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred under the agreement by the State of Registry to the State of the principal location of a general aviation operator, when conducting surveillance activities such as ramp checks.

***Note.** Guidance for the civil aviation safety inspector conducting an inspection of an aircraft ~~aeroplane~~ operated under an Article 83 bis agreement is contained in the ICAO Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).*

2.4.18.3 The agreement summary shall be transmitted to ICAO together with the Article 83 bis agreement for registration with the ICAO Council by the State of Registry or the State of the principal location of a general aviation operator.

***Note**. The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council contains the list of all aircraft affected by the agreement. However, the certified true copy to be carried on board, as per 2.4.18.1, will need to list only the specific aircraft carrying the copy.*

2.4.18.4 The agreement summary should contain the information in Appendix 2.5 for the specific aircraft and should follow the layout of Appendix 2.5, paragraph 2.

# CHAPTER 2.5 AIRCRAFT ~~AEROPLANE~~ COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

## 2.5.1 Communication equipment

2.5.1.1 An aircraft ~~aeroplane~~ to be operated in accordance with the instrument flight rules or at night shall be provided with radio communication equipment. Such equipment shall be capable of conducting two-way communication with those aeronautical stations and on those frequencies prescribed by the appropriate authority.

***Note**. The requirements of 2.5.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.*

2.5.1.2 When compliance with 2.5.1.1 requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

2.5.1.3 An aircraft ~~aeroplane~~ to be operated in accordance with VFR, but as a controlled flight, shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

2.5.1.4 An aircraft ~~aeroplane~~ to be operated on a flight to which the provisions of 2.4.4.3.1, 2.4.4.4 or 2.4.5 apply shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

2.5.1.5 For aeroplanes, ~~T~~the radio communication equipment required in accordance with 2.5.1.1 to 2.5.1.4 shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

2.5.1.6 For helicopters, the radio communication equipment required in accordance with 2.5.1.1 to 2.5.1.4 should provide for communication on the aeronautical emergency frequency 121.5 MHz.

2.5.1.~~6~~ 7 For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aircraft ~~aeroplane~~ shall, in addition to the requirements specified in 2.5.1.1 to 2.5.1.5:

a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s);

b) have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aircraft ~~aeroplane~~ documentation approved by the State of Design or State of Registry; and

c) where the aircraft ~~aeroplane~~ is operated in accordance with a MEL, have information relevant to the aircraft ~~aeroplane~~ RCP specification capabilities included in the MEL.

***Note**. Information on the performance-based communication and surveillance (PBCS) concept and*

*guidance material on its implementation are contained in the ICAO Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).*

2.5.1.~~7~~ 8 The State of Registry shall establish criteria for operations where an RCP specification for PBC has been prescribed.

2.5.1.~~8~~ 9 In establishing criteria for operations where an RCP specification for PBC has been prescribed, the State of Registry shall require that the operator/owner establish:

a) normal and abnormal procedures, including contingency procedures;

b) flight crew qualification and proficiency requirements, in accordance with the appropriate RCP specifications;

c) a training programme for relevant personnel consistent with the intended operations; and

d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

2.5.1.~~9~~ 10 The State of Registry shall ensure that, in respect of those aircraft ~~aeroplanes~~ mentioned in 2.5.1.7~~6~~, adequate provisions exist for:

a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with KCASR 11, Chapter 3, 3.3.5.2; and

b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specification(s).

**2.5.2 Navigation equipment**

2.5.2.1 An aircraft ~~aeroplane~~ shall be provided with navigation equipment which will enable it to proceed:

a) in accordance with its flight plan; and

b) in accordance with the requirements of air traffic services; except when, if not so precluded by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to landmarks.

2.5.2.2 For operations where a navigation specification for performance-based navigation (PBN) has been prescribed, an aircraft ~~aeroplane~~ shall, in addition to the requirements specified in 2.5.2.1:

a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and

b) have information relevant to the aircraft ~~aeroplane~~ navigation specification capabilities listed in the flight manual or other aircraft ~~aeroplane~~ documentation approved by the State of Design or State of Registry; and

c) where the aircraft ~~aeroplane~~ is operated in accordance with a MEL, have information relevant to the aircraft ~~aeroplane~~ navigation specification capabilities included in the MEL.

***Note**. Guidance on aircraft ~~aeroplane~~ documentation is contained in the ICAO Performance-based Navigation (PBN) Manual (Doc 9613).*

2.5.2.3 The State of Registry shall establish criteria for operations where a navigation specification for PBN has been prescribed.

2.5.2.4 In establishing criteria for operations where a navigation specification for PBN has been prescribed, the State of Registry shall require that the operator/owner establish:

a) normal and abnormal procedures including contingency procedures;

b) flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications;

c) training for relevant personnel consistent with the intended operations; and

d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with the appropriate navigation specifications.

***Note 1.** Guidance on safety risks and mitigations for PBN operations, in accordance with Annex 19, are contained in the ICAO Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997).*

***Note 2.** Electronic navigation data management is an integral part of normal and abnormal procedures.*

2.5.2.5 The State of Registry shall issue a specific approval for operations based on PBN authorization required (AR) navigation specifications.

***Note**. Guidance on specific approvals for PBN authorization required (AR) navigation specifications is contained in the ICAO Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997).*

2.5.2.6 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specifications (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

b) has been authorized by the State of Registry for the MNPS operations concerned.

**Note.** The prescribed minimum navigation performance specifications and the procedures governing their application are published in the ICAO Regional Supplementary Procedures (Doc 7030).

2.5.2.7 For aeroplanes, ~~F~~for flights in defined portions of airspace where, based on Regional Air Navigation Agreement, a reduced vertical separation minimum (RVSM) of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive:

a) the aeroplane shall be provided with equipment which is capable of:

1) indicating to the flight crew the flight level being 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 ±90 m (300 ft); and

4) automatically reporting pressure-altitude;

b) the State of Registry shall issue a specific approval for RVSM operations.

2.5.2.8 Prior to granting the RVSM specific approval required in accordance with 2.5.2.7 b), the State shall be satisfied that:

a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Appendix 2.2;

b) the owner/operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and

c) the owner/operator has instituted appropriate flight crew procedures for operations in RVSM airspace.

***Note**. An RVSM specific approval is valid globally on the understanding that any operating procedures specific to a given region will be stated in the operations manual or appropriate crew guidance.*

2.5.2.9 The State of Registry shall ensure that, in respect of those aeroplanes mentioned in 2.5.2.7, adequate provisions exist for:

a) receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with Annex 11, 3.3.5.1; and

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

2.5.2.10 The State of Registry that has issued an RVSM specific approval to an owner/operator shall establish a requirement which ensures that a minimum of two aeroplanes of each aircraft type grouping of the owner/operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If an owner/operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

***Note**. Monitoring data from any regional monitoring programme established in accordance with Annex 11, 3.3.5.2, may be used to satisfy the requirement.*

2.5.2.11 All States that are responsible for airspace where RVSM has been implemented, or that have issued RVSM specific approvals to owners/operators within their State, shall establish provisions and procedures which ensure that appropriate action will be taken in respect of aircraft and owners/operators found to be operating in RVSM airspace without a valid RVSM specific approval.

***Note 1.** These provisions and procedures need to address both the situation where the aircraft in question was operating without a specific approval in the airspace of the State, and the situation where an owner/operator for which the State has regulatory oversight responsibility is found to be operating without the required specific approval in the airspace of another State.*

***Note 2.** Guidance material relating to the specific approval for operation in RVSM airspace is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc 9574).*

2.5.2.12 The aircraft ~~aeroplane~~ shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the

remaining equipment will enable the aircraft ~~aeroplane~~ to navigate in accordance with 2.5.2.1 and where applicable 2.5.2.2, 2.5.2.6 and 2.5.2.7.

***Note 1**. This requirement may be met by means other than the duplication of equipment.*

***Note 2**. Guidance material relating to aircraft equipment necessary for flight in airspace where a 300 m (1 000 ft) VSM is applied above FL 290 is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc 9574).*

2.5.2.13 On flights in which it is intended to land in instrument meteorological conditions, an aircraft ~~aeroplane~~ shall be provided with ~~radio~~ navigation equipment capable of receiving signals providing guidance to a point from which a visual landing can be affected. This equipment shall be capable of providing such guidance for each aerodrome, heliport or landing location at which it is intended to land in instrument meteorological conditions and for any designated alternate aerodromes or heliports.

**2.5.3 Surveillance equipment**

2.5.3.1 An aircraft ~~aeroplane~~ shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

2.5.3.2 For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), an aircraft ~~aeroplane~~ shall, in addition to the requirements specified in 2.5.3.1:

a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

b) have information relevant to the aircraft ~~aeroplane~~ RSP specification capabilities listed in the flight manual or other aircraft ~~aeroplane~~ documentation approved by the State of Design or State of Registry; and

c) where the aircraft ~~aeroplane~~ is operated in accordance with a MEL, have information relevant to the aircraft ~~aeroplane~~ RSP specification capabilities included in the MEL.

***Note 1.** Information on surveillance equipment is contained in the ICAO Aeronautical Surveillance Manual (Doc 9924).*

***Note 2**. Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) ICAO Manual (ICAO Doc 9869).*

2.5.3.3 The Kuwait DGCA shall establish criteria for operations where an RSP specification for PBS has been prescribed.

2.5.3.4 In establishing criteria for operations where an RSP specification for PBS has been prescribed, the Kuwait DGCA shall require that the operator/owner establish:

a) normal and abnormal procedures, including contingency procedures;

b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

c) a training programme for relevant personnel consistent with the intended operations; and

d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

2.5.3.5 The Kuwait DGCA shall ensure that, in respect of those aircraft ~~aeroplanes~~ mentioned in 2.5.3.2, adequate provisions exist for:

a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with KCASR 11, Chapter 3, 3.3.5.2; and

b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification(s).

# CHAPTER 2.6 AIRCRAFT ~~AEROPLANE~~ CONTINUING AIRWORTHINESS

***Note 1.*** *For the purpose of this chapter "aeroplane" includes: engines, propellers, components, accessories, instruments, equipment and apparatus including emergency equipment.*

***Note 2****. For the purpose of this chapter "helicopter" includes: engines, power transmissions, rotors, components, accessories, instruments, equipment and apparatus including emergency equipment.*

***Note ~~2~~3****. Guidance on continuing airworthiness requirements is contained in the ICAO Airworthiness Manual (Doc 9760).*

***Note ~~3~~4****. Kuwait ~~DGCA~~ CAA should conduct a risk assessment when approving a maintenance programme not based on the type certificate holder's maintenance recommendations.*

## 2.6.1 Owner's continuing airworthiness responsibilities

2.6.1.1 The owner of an aircraft~~aeroplane~~, or in the case where it is leased, the lessee, shall ensure that, in accordance with procedures acceptable to the Kuwait ~~DGCA~~CAA:

a) the aircraft ~~aeroplane~~ is maintained in an airworthy condition;

b) the operational and emergency equipment necessary for an intended flight is serviceable; and

c) the certificate of airworthiness of the aircraft~~aeroplane~~ remains valid.

2.6.1.2 The owner or the lessee shall not operate an aircraft ~~aeroplane~~ unless maintenance on the aircraft~~aeroplane~~, including any associated engine, propeller or rotor and part, is carried out:

a) by an organization complying with KCASR 8 part 145 or Annex 8 Part II, Chapter 6 as applicable that is either approved by the Kuwait ~~DGCA~~ CAA or is approved by another Contracting State and is accepted by the Kuwait ~~DGCA~~CAA; or

b) by a person or organization in accordance with procedures that are authorized by the Kuwait ~~DGCA~~CAA; and there is a maintenance release in relation to the maintenance carried out.

2.6.1.3 The owner or the lessee shall ensure that the maintenance of the aircraft ~~aeroplane~~ is performed in accordance with a maintenance programme acceptable to Kuwait ~~DGCA~~CAA.

## 2.6.2 Continuing airworthiness records

2.6.2.1 The owner of an aircraft~~aeroplane~~, or in the case where it is leased, the lessee, shall ensure that the following records are kept for the periods mentioned in 2.6.2.2:

a) the total time in service (hours, calendar time and cycles, as appropriate) of the aircraft ~~aeroplane~~ and all life-limited components;

b) the current status of compliance with all applicable mandatory continuing airworthiness information;

c) appropriate details of modifications and repairs;

d) the time in service (hours, calendar time and cycles, as appropriate) since the last overhaul

of the aircraft ~~aeroplane~~ or its components subject to a mandatory overhaul life;

e) the current status of the ~~aeroplane~~aircraft's compliance with the maintenance programme; and

f) the detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

2.6.2.2 The records in 2.6.2.1 a) to e) shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service and the records in 2.6.2.1 f) for a minimum period of one year after the signing of the maintenance release.

2.6.2.3 In the event of a temporary change of owner or lessee, the records shall be made available to the new owner or lessee. In the event of any permanent change of owner or lessee, the records shall be transferred to the new owner or lessee.

***Note 1**. Continuing airworthiness records or related documents, other than a valid certificate of airworthiness, need not be carried in the aircraft ~~aeroplane~~ during international flights.*

***Note 2**. In the context of 2.6.2.3, a judgement on what should be considered as a temporary change of owner or lessee will need to be made by the State of Registry in the light of the need to exercise control over the records, which will depend on access to them and the opportunity to update them.*

2.6.2.4 Records kept and transferred in accordance with 2.6.2 shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

***Note 1.** The form and format of the records may include, for example, paper records, film records, electronic records or any combination thereof.*

***Note 2**. Guidance regarding electronic aircraft continuing airworthiness records is included in the Airworthiness Manual (ICAO Doc 9760).*

### 2.6.3 Continuing airworthiness information – for helicopters

The owner of a helicopter over 3 175 kg maximum certificated take-off mass, or in the case where it is leased, the lessee, shall, as required by the Kuwait CAA, to ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness is transmitted as required by KCASR 8.

### 2.6.~~3~~ 4 Modifications and repairs

All modifications and repairs shall comply with airworthiness requirements acceptable to the Kuwait DGCA. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

### 2.6.~~4~~ 5 Maintenance release

2.6.~~4~~5.1 When maintenance is carried out by an approved maintenance organization, the maintenance release shall be issued by the approved maintenance organization in accordance with the provisions of KCASR 8 Part 145 or Annex 8, Part II, 6.8 as applicable.

2.6.~~4~~5.2 When maintenance is not carried out by an approved maintenance organization, the

maintenance release shall be completed and signed by a person appropriately licensed in accordance with KCASR 1 to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures acceptable to the Kuwait DGCA.

2.6.~~4~~5.3 When maintenance is not carried out by an approved maintenance organization, the maintenance release shall include the following:

a) basic details of the maintenance performed;

b) the date such maintenance was completed; and

c) the identity of the authorized person or persons signing the release.

# CHAPTER 2.7 AIRCRAFT ~~AEROPLANE~~ FLIGHT CREW

## 2.7.1 Composition of the flight crew

The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

## 2.7.2 Qualifications

2.7.2.1 The pilot-in-command shall:

a) ensure that each flight crew member holds a valid licence issued by the Kuwait DGCA, or if issued by another Contracting State, rendered valid by the Kuwait DGCA;

b) ensure that flight crew members are properly rated; and

c) be satisfied that flight crew members have maintained competency.

2.7.2.2 The pilot-in-command of an aeroplane equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collision.

***Note 1.*** *Procedures for the use of ACAS II equipment are specified in the Procedures for ICAO Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume I — Flight Procedures. ACAS II Training Guidelines for Pilots are provided in PANS-OPS, Volume I, Attachment A to Part III, Section 3, Chapter 3.*

***Note 2.*** *Appropriate training, to the satisfaction of the Kuwait DGCA, to competency in the use of ACAS II equipment and the avoidance of collisions may be evidenced, for example, by:*

a) possession of a type rating for an aeroplane equipped with ACAS II, where the operation and use of ACAS II are included in the training syllabus for the type rating; or

b) possession of a document issued by a training organization or person approved by the Kuwait DGCA to conduct training for pilots in the use of ACAS II, indicating that the holder has been trained in accordance with the guidelines referred to in Note 1; or

c) if Accepted by Kuwait DGCA, a comprehensive pre-flight briefing by a pilot who has been trained in the use of ACAS II in accordance with the guidelines referred to in Note 1.

# CHAPTER 2.8 MANUALS, LOGS AND RECORDS

***Note**. The following documents are associated with this Regulation but are not included in this chapter: Continuing airworthiness records — see 2.6.2.*

## 2.8.1 Flight manual

***Note**. The ~~aeroplane~~ flight manual contains the information specified in KCASR 8.*

The ~~aeroplane~~ flight manual shall be updated by implementing changes made mandatory by the Kuwait DGCA.

## 2.8.2 Journey log book

2.8.2.1 A journey log book shall be maintained for every aircraft ~~aeroplane~~ engaged in international air navigation in which shall be entered particulars of the aircraft ~~aeroplane~~, its crew and each journey.

2.8.2.2 The aeroplane journey log should contain the following items:

a) aircraft ~~aeroplane~~ nationality and registration;

b) date;

c) crew member names and duty assignments;

d) departure and arrival points and times;

e) purpose of flight;

f) observations regarding the flight; and

g) signature of the pilot-in-command.

## 2.8.3 Records of emergency and survival equipment carried

The owner of the aeroplane, or in the case where it is leased, the lessee, shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board the aeroplane engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

# CHAPTER 2.9 SECURITY

## 2.9.1 Security of aircraft

The pilot-in-command shall be responsible for the security of the aircraft during its operation.

## 2.9.2 Reporting acts of unlawful interference

Following an act of unlawful interference, the pilot-in-command shall submit a report of such an act to the designated local authority and Kuwait DGCA.

***Note**. In the context of this chapter, the word "security" is used in the sense of prevention of acts of unlawful interference against civil aviation.*

# APPENDIX 2.1 LIGHTS TO BE DISPLAYED BY AIRCRAFT~~AEROPLANES~~

(Section 2, Chapter 2.4, 2.4.8, refers)

## 1. TERMINOLOGY

When the following terms are used in this Appendix, they have the following meanings:

**Angles of coverage.**

a) Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.

b) Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.

c) Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aircraft ~~aeroplane~~, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.

d) Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aircraft~~aeroplane~~, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis. Horizontal plane. The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane.

**Horizontal plane.** The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aircraft

**Longitudinal axis of the ~~aeroplane~~aircraft.** A selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the aircraft~~aeroplane~~.

**Making way**. An aeroplane on the surface of the water is “making way” when it is under way and has a velocity relative to the water.

**Under command**. An aircraft ~~aeroplane~~ on the surface of the water is “under command” when it is able to execute manoeuvres as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

**Under way**. An aircraft ~~aeroplane~~ on the surface of the water is “under way” when it is not aground or moored to the ground or to any fixed object on the land or in the water.

**Vertical planes**. Planes perpendicular to the horizontal plane.

**Visible**. Visible on a dark night with a clear atmosphere.

## 2. NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

***Note**. The lights specified herein are intended to meet the requirements of Annex 2 for navigation lights.*

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

a) a red light projected above and below the horizontal plane through angle of coverage L;

b) a green light projected above and below the horizontal plane through angle of coverage R;

c) a white light projected above and below the horizontal plane rearward through angle of coverage A.

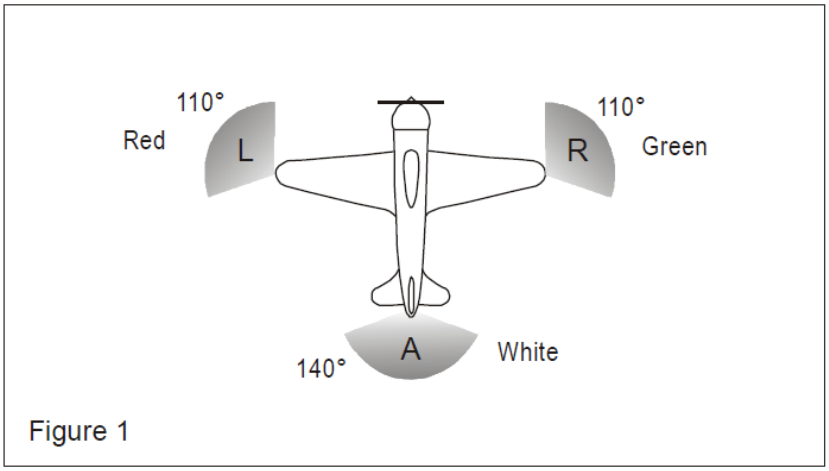



Figure 1

## 3. LIGHTS TO BE DISPLAYED ON THE WATER

### 3.1 General

*Note. The lights specified herein are intended to meet the requirements of Annex 2 for lights to be displayed by aircraft ~~aeroplanes~~ on the water.*

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following

circumstances:

a) when under way;

b) when towing another vessel or aeroplane;

c) when being towed;

d) when not under command and not making way;

e) when making way but not under command;

f) when at anchor;

g) when aground.

The lights required by aircraft ~~aeroplanes~~ in each case are described below.

### 3.2 When under way

As illustrated in Figure 2, the following appearing as steady, unobstructed lights:

a) a red light projected above and below the horizontal through angle of coverage L;

b) a green light projected above and below the horizontal through angle of coverage R;

c) a white light projected above and below the horizontal through angle of coverage A; and

d) a white light projected through angle of coverage F.

The lights described in a), b) and c) should be visible at a distance of at least 3.7 km (2 NM). The light described in d) should be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

### 3.3 When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

a) the lights described in 3.2;

b) a second light having the same characteristics as the light described in 3.2 d) and mounted in a vertical line at least 2 m above or below it; and

c) a yellow light having otherwise the same characteristics as the light described in 3.2 c) and mounted in a vertical line at least 2 m above it.

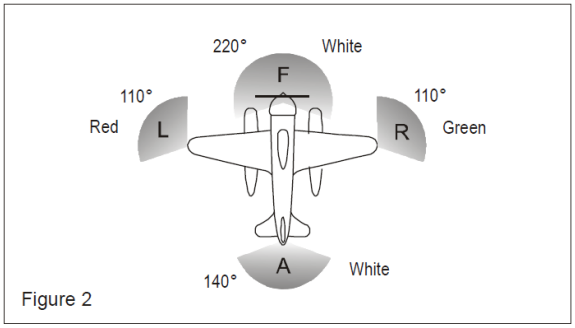


Figure 2

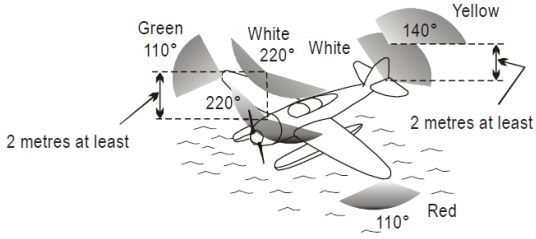


Figure 3

### 3.4 When being towed

The lights described in 3.2 a), b) and c) appearing as steady, unobstructed lights.

### 3.5 When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

### 3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 a), b) and c).

***Note**. The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aircraft ~~aeroplane~~ showing them is not under command and cannot therefore get out of the way. They are not signals of aircraft ~~aeroplanes~~ in distress and requiring assistance.*

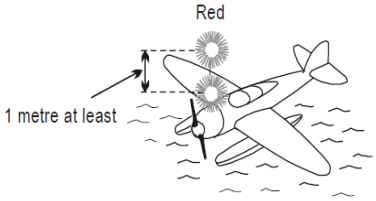


Figure 4

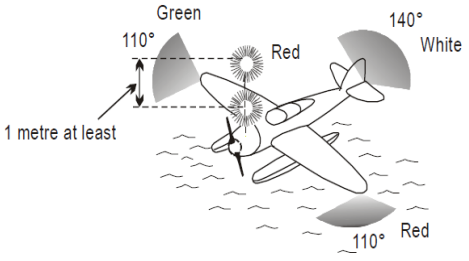


Figure 5

### 3.7 When at anchor

a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).

b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).

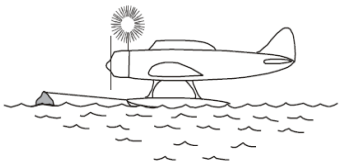


Figure 6

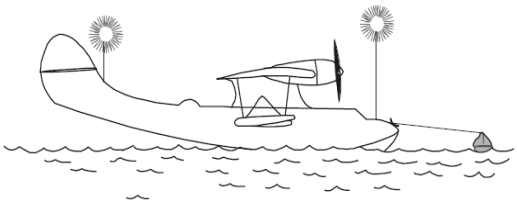
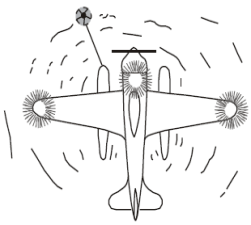


Figure 7

c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).

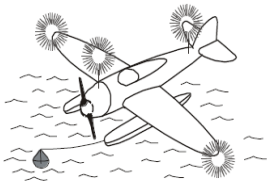
### 3.8 When aground

The lights prescribed in 3.7 and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon.



Less than 50 metres in length; 50 metres or more in span

Figure 8



50 metres or more in length; 50 metres or more in span

Figure 9

# APPENDIX 2.2 ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE

(Section 2, Chapter 2.5, 2.5.2.8, refers)

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80 ft) in magnitude and shall have a standard deviation no greater than $28 – 0.013z2$ for $0 \leq z \leq 25$ when z is the magnitude of the mean TVE in metres, or $92 – 0.004z2$ for $0 \leq z \leq 80$ where z is in feet. In addition, the components of TVE shall have the following characteristics:

   a) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude;

   b) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft); and

   c) the differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

2. In respect of aeroplanes for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aeroplanes encompassed by paragraph 1, the height-keeping performance capability shall be such that the components of the TVE of the aeroplane have the following characteristics:

   a) the ASE of the aeroplane shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and

   b) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

## APPENDIX 2.3 FLIGHT RECORDERS

(Section 2, Chapter 2.4, 2.4.16, refers)

The material in this Appendix concerns flight recorders intended for installation in *aircraft* ~~aeroplanes~~ engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following:

— a flight data recorder (FDR),

— a cockpit voice recorder (CVR),

— an airborne image recorder (AIR),

— a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following:

— an aircraft data recording system (ADRS),

— a cockpit audio recording system (CARS),

— an airborne image recording system (AIRS),

— a data link recording system (DLRS).

When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS.

### 1. GENERAL REQUIREMENTS

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange colour.

1.2 Non-deployable crash-protected flight recorder containers shall:

a) carry reflective material to facilitate their location; and

b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kilohertz (kHz). At the earliest practical date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

1.3 Automatic deployable flight recorder containers shall:

a) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;

b) carry reflective material to facilitate their location; and

c) have an integrated automatically activated ELT.

1.4 The flight recorder systems shall be installed so that:

a) the probability of damage to the recordings is minimized;

b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and

d) for aircraft ~~aeroplanes~~ for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

***Note**. The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.*

1.5 The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

1.6 The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

1.7 The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

1.8 Means shall be provided for an accurate time correlation between the flight recorder systems recordings.

1.9 The flight recorder system manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recorder systems:

a) manufacturer's operating instructions, equipment limitations and installation procedures;

b) parameter origin or source and equations which relate counts to units of measurement;

c) manufacturer's test reports; and

d) detailed information to ensure the continued serviceability of the flight recorder system.

1.10 The holder of the airworthiness approval for the installation design of the flight recorder system shall make available the relevant continuing airworthiness information to the operator of the aircraft ~~aeroplane~~ to be incorporated in the continuing airworthiness maintenance programme. This continuing airworthiness information shall cover in detail all the tasks required to ensure the continued serviceability of the flight recorder system.

***Note 1**. The flight recorder system is composed of the flight recorder as well as any dedicated sensors, hardware and software that provide information required in this Appendix.*

***Note 2.** Conditions related to the continued serviceability of a flight recorder system are defined in section 6 of this appendix. The ICAO Manual on Flight Recorder System Maintenance (FRSM) (ICAO Doc 10104) provides guidance on maintenance tasks associated with flight recorder systems.*

## 2. FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEM (ADRS)

### 2.1 Start and stop logic

The FDR or ADRS shall start to record prior to the aircraft ~~aeroplane~~ moving under its own power and record continuously until the termination of the flight when the aircraft ~~aeroplane~~ is no longer capable of moving under its own power.

### 2.2 Parameters to be recorded

2.2.1 The parameters that satisfy the requirements for FDRs are listed in Table A2.3-1 for aeroplanes and Table A2.3-2 for helicopters. The number of parameters to be recorded shall depend on aircraft ~~aeroplane~~ complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

2.2.2 If further FDR 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;

3) warnings and alerts; and

4) the identity of displayed pages for emergency procedures and checklists;

b) additional engine parameters (EPR, N1, fuel flow, etc.); and

~~b~~c) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.

2.2.2.3 The parameters that satisfy the recommendations for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) are to be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:

| *For aeroplanes* | *For helicopters* |
|---|---|
| — Pressure altitude | — Pressure altitude |
| — Indicated airspeed or calibrated airspeed | — Indicated airspeed |
| — Heading (primary flight crew reference) | — Outside air temperature |
| — Pitch attitude | — Heading |
| — Roll attitude | — Heading |
| — Engine thrust/power | — Lateral acceleration |

| | |
|---|---|
| — Landing gear status* | — Longitudinal acceleration (body axis) |
| — Total or outside air temperature* | — Time or relative time count |
| — Time* | — Navigation data*: drift angle, wind speed, wind direction, latitude/longitude |
| — Navigation data*: Drift angle, wind speed, wind direction, latitude/longitude | — Radio altitude* |
| — Radio altitude* | |

2.2.4 The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table A2.3-~~3~~4 for aeroplanes, and A2.3-5 for helicopters.

2.2.5 If further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A2.3-~~3~~4 for aeroplanes, and A2.3-5 for helicopters shall be considered.

**2.3 Additional information**

2.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

2.3.2 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

**3. COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)**

**3.1 Start and stop logic**

The CVR or CARS shall start to record prior to the aircraft ~~aeroplane~~ moving under its own power and record continuously until the termination of the flight when the aircraft ~~aeroplane~~ is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

**3.2 Signals to be recorded**

3.2.1 The CVR shall record simultaneously on four separate channels, or more, at least the following:

a) voice communication transmitted from or received in the aircraft ~~aeroplane~~ by radio;

b) aural environment on the flight deck;

c) voice communication of flight crew members on the flight deck using the aircraft's ~~aeroplane's~~ interphone system, if installed;

d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; ~~and~~

e) for aeroplanes, digital communications with ATS, unless recorded by the FDR; and~~.~~

f) for helicopters, voice communication of flight crew members using the passenger address system, if installed.

3.2.2 The preferred CVR audio allocation should be as follows:

a) pilot-in-command audio panel;

b) co-pilot audio panel;

c) additional flight crew positions and time reference; and

d) cockpit area microphone.

3.2.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

a) voice communication transmitted from or received in the aircraft ~~aeroplane~~ by radio;

b) aural environment on the flight deck; and

c) voice communication of flight crew members on the flight deck using the aircraft's ~~aeroplane's~~ interphone system, if installed.

3.2.4 The preferred CARS audio allocation should be as follows:

a) voice communication; and

b) aural environment on the flight deck.

## 4. AIRBORNE IMAGE RECORDER (AIR) AND AIRBORNE IMAGE RECORDING SYSTEM (AIRS)

### 4.1 Start and stop logic

The AIR or AIRS shall start to record prior to the aircraft ~~aeroplane~~ moving under its own power and record continuously until the termination of the flight when the aircraft ~~aeroplane~~ is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

### 4.2 Classes

4.2.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

***Note 1.*** *To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

***Note 2****. There are no provisions for Class A AIR or AIRS in this document.*

4.2.2 A Class B AIR or AIRS captures data link message displays.

4.2.3 A Class C AIR or AIRS captures instruments and control panels.

***Note****. A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.*

## 5. DATA LINK RECORDER (DLR)

### 5.1 Applications to be recorded

5.1.1 Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable,

the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

***Note**. Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.*

5.1.2 Messages applying to the applications listed in Table A2.3-~~2~~ 3 shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

## 6. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

6.1 Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

6.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

6.3 Recording inspections shall be carried out as follows:

a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

b) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable;

f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards; and

g) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.

6.4 A flight recorder system shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

6.5 A report of the recording inspection shall be made available on request to regulatory authorities for monitoring purposes.

6.6 Calibration of the FDR system:

a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every five years. The recalibration shall determine any discrepancies in the engineering conversion routines for the mandatory parameters, and to ensure that parameters are being recorded within the calibration tolerances; and

b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every two years.

## Table A2.3-1 Parameter characteristics for flight data recorders – Aeroplanes

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure altitude | | −300 m (−1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed or calibrated airspeed | | 95 km/h (50 kt) to 1.2 V_D | 1 | ±5% ±3% | 1 kt (0.5 kt recommended) |
| 4 | Heading (primary flight crew reference) | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration | | −3 g to +6 g | 0.125 | ±1% of maximum range excluding datum error of ±5% | 0.004 g |
| 6 | Pitch attitude | | ±75° or usable range whichever is greater | 0.25 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.25 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | | |
| 9 | Power on each engine (Note 3) | | Full range | 1 (per engine) | ±2% | 0.2% of full range or the resolution required to operate the aircraft |
| 10* | Trailing edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| | | | | | | required to operate the aircraft |
| 11* | Leading edge flap and cockpit control selection | | Full range or each discrete position | 2 | ±5% or as pilot's indicator | 0.5% of full range or the resolution required to operate the aircraft |
| 12* | Thrust reverser position | | Stowed, in transit, and reverse | 1 (per engine) | | |
| 13* | Ground spoiler/speed brake selection (selection and position) | | Full range or each discrete position | 1 | ±2% unless higher accuracy uniquely required | 0.2% of full range |
| 14 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 15* | Autopilot/auto throttle/AFCS mode and engagement status | | A suitable combination of discretes | 1 | | |
| 16 | Longitudinal acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 17 | Lateral acceleration (Note 3) | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) (Notes 4 and 8) | Application for type certification submitted before 1 January 2016 | Full range | 0.25 | ±2° unless higher accuracy uniquely required | 0.2% of full range or as installed |
| 18 | Pilot input and/or control surface position-primary controls (pitch, roll, yaw) | Application for type certification submitted on or after 1 January | Full range | 0.125 | ±2° unless higher accuracy uniquely | 0.2% of full range or as |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| | (Notes 4 and 8) | 2016 | | | required | installed |
| 19 | Pitch trim position | | Full range | 1 | ±3% unless higher accuracy uniquely required | 0.3% of full range or as installed |
| 20* | Radio altitude | | −6 m to 750 m (−20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft); 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 21* | Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 22* | Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation) | | Signal range | 1 | ±3% | 0.3% of full range |
| 23 | Marker beacon passage | | Discrete | 1 | | |
| 24 | Master warning | | Discrete | 1 | | |
| 25 | Each NAV receiver frequency selection (Note 5) | | Full range | 4 | As installed | |
| 26* | DME 1 and 2 distance (includes distance to runway threshold (GLS) and distance to missed approach point (IRNAV/IAN)) (Notes 5 and 6) | | 0–370 km (0–200 NM) | 4 | As installed | 1 852 m (1 NM) |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| 27 | Air/ground status | | Discrete | 1 | | |
| 28* | GPWS/TAWS/GCAS status (terrain display mode selection including pop-up display status, terrain alerts, cautions and warnings, advisories, and on/off switch position) | | Discrete | 1 | | |
| 29* | Angle of attack | | Full range | 0.5 | As installed | 0.3% of full range |
| 30* | Hydraulics, each system (low pressure) | | Discrete | 2 | | 0.5% of full range |
| 31* | Navigation data (latitude/longitude, ground speed and drift angle) (Note 7) | | As installed | 1 | As installed | |
| 32* | Landing gear and gear selector position | | Discrete | 4 | As installed | |
| 33* | Groundspeed | | As installed | 1 | Data should be obtained from the most accurate system | 1 kt |
| 34 | Brakes (left and right brake pressure, left and right brake pedal position) | | Maximum metered brake range, discretes or full range | 1 | ±5% | 2% of full range |
| 35* | Additional engine parameters (EPR, N1, indicated vibration level, N2, EGT, fuel flow, fuel cut-off lever position, N3 engine fuel metering valve position) | Engine fuel metering valve position: application for type certification submitted on or after 1 January 2023 | As installed | Each engine each second | As installed | 2% of full range |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| 36* | TCAS/ACAS (traffic alert and collision avoidance system) | | Discrete(s) | 1 | As installed | |
| 37* | Wind shear warning | | Discrete | 1 | As installed | |
| 38* | Selected barometric setting (pilot, co-pilot) | | As installed | 64 | As installed | 0.1 mb (0.~~01~~03 in-Hg) |
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 44* | Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN)) | | | 1 | As installed | As installed |
| 45* | Selected decision height | | As installed | 64 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot, | | Discrete(s) | 4 | As installed | |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| | co-pilot) | | | | | |
| 47* | Multi-function/engine/alerts display format | | Discrete(s) | 4 | As installed | |
| 48* | AC electrical bus status | | Discrete(s) | 4 | As installed | |
| 49* | DC electrical bus status | | Discrete(s) | 4 | As installed | |
| 50* | Engine bleed valve position | | Discrete(s) | 4 | As installed | |
| 51* | APU bleed valve position | | Discrete(s) | 4 | As installed | |
| 52* | Computer failure | | Discrete(s) | 4 | As installed | |
| 53* | Engine thrust command | | As installed | 2 | As installed | 2% of full range |
| 54* | Engine thrust target | | As installed | 4 | As installed | 2% of full range |
| 55* | Computed centre of gravity | | As installed | 64 | As installed | 1% of full range |
| 56* | Fuel quantity in CG trim tank | | As installed | 64 | As installed | 1% of full range |
| 57* | Head-up display in use | | As installed | 4 | As installed | |
| 58* | Para-visual display on/off | | As installed | 1 | As installed | |
| 59* | Operational stall protection, stick shaker and pusher activation | | As installed | 1 | As installed | |
| 60* | Primary navigation system reference (GNSS, INS, VOR/DME, MLS, | | As installed | 4 | As installed | |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| | Loran C, localizer glide slope) | | | | | |
| 61* | Ice detection | | As installed | 4 | As installed | |
| 62* | Engine warning each engine vibration | | As installed | 1 | As installed | |
| 63* | Engine warning each engine over temperature | | As installed | 1 | As installed | |
| 64* | Engine warning each engine oil pressure low | | As installed | 1 | As installed | |
| 65* | Engine warning each engine over speed | | As installed | 1 | As installed | |
| 66* | Yaw trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 67* | Roll trim surface position | | Full range | 2 | ±3% unless higher accuracy uniquely required | 0.3% of full range |
| 68* | Yaw or sideslip angle | | Full range | 1 | ±5% | 0.5° |
| 69* | De-icing and/or anti-icing systems selection | | Discrete(s) | 4 | | |
| 70* | Hydraulic pressure (each system) | | Full range | 2 | ±5% | 100 psi |
| 71* | Loss of cabin pressure | | Discrete | 1 | | |
| 72* | Cockpit trim control input position, Pitch | | Full range | 1 | ±5% | 0.2% of full range or as installed |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| 73* | Cockpit trim control input position, Roll | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 74* | Cockpit trim control input position, Yaw | | Full range | 1 | ±5% | 0.2% of full range or as installed |
| 75 | All cockpit flight control input forces (control wheel, control column, rudder pedal) | | Full range (±311 N (±70 lbf), ±378 N (±85 lbf), ±734 N (±165 lbf)) | 1 | ±5% | 0.2% of full range or as installed |
| 76* | Event marker | | Discrete | 1 | | |
| 77* | Date | | 365 days | 64 | | |
| 78* | Actual navigation performance or estimated position error or estimated position uncertainty | | As installed | 4 | As installed | |
| 79* | Cabin pressure altitude | Application for type certification submitted on or after 1 January 2023 | As installed (0 ft to 40 000 ft recommended) | 1 | As installed | 100 ft |
| 80* | Aeroplane computed weight | Application for type certification submitted on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 81* | Flight director command (left flight director pitch command, left flight director roll command, right flight director pitch command, right flight director roll command) | Application for type certification submitted on or after 1 January 2023 | Full range | 1 | ±2° | 0.5° |
| 82* | Vertical speed | Application for type | As installed | 0.25 | As installed (32 | 16 ft/min |

| Serial | Parameter | Applicability | Measurement Range | Max Sampling Interval (s) | Accuracy Limits | Recording Resolution |
|---|---|---|---|---|---|---|
| | | certification submitted on or after 1 January 2023 | | | ft/min recommended) | |

***Notes***

*1. Vs0: 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 control systems in which movement of a control surface will back drive the pilot's control, "or" applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot's control, "and" applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.*

*5. If signal available in digital form.*

*6. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.*

*7. If signals readily available.*

*8. It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording intervals, accuracy limits or recording resolution guidance description detailed in this Appendix*

**Table A2.3-2. Description of applications for data link recorders – Helicopters**

| Serial Number | Parameter | Applicability | Measurement Range | Maximum Sampling & Recording Interval (s) | Accuracy Limits (sensor input compared to FDR readout) | Recording Resolution |
|---|---|---|---|---|---|---|
| 1 | Time (UTC when available, otherwise relative time count or GNSS time sync) | | 24 hours | 4 | ±0.125%/h | 1 s |
| 2 | Pressure altitude | | −300 m (−1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft) | 1 | ±30 m to ±200 m (±100 ft to ±700 ft) | 1.5 m (5 ft) |
| 3 | Indicated airspeed | | As the installed pilot display measuring system | 1 | ±3% | 1 kt |
| 4 | Heading | | 360° | 1 | ±2° | 0.5° |
| 5 | Normal acceleration | | −3 g to +6 g | 0.125 | ±0.09 g excluding a datum error of ±0.045 g | 0.004 g |
| 6 | Pitch attitude | | ±75° or 100% of useable range whichever is greater | 0.5 | ±2° | 0.5° |
| 7 | Roll attitude | | ±180° | 0.5 | ±2° | 0.5° |
| 8 | Radio transmission keying | | On-off (one discrete) | 1 | — | — |
| 9 | Power on each engine | | Full range | 1 (per engine) | ±2% | 0.1% of full range |
| 10 | Main rotor:<br>Main rotor speed<br>Rotor brake | | 50–130%<br>Discrete | 0.5<br>1 | ±2%<br>— | 0.3% of full range<br>— |
| 11 | Pilot input and/or control surface position — primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal) | | Full range | 0.5 (0.25 recommended) | ±2% unless higher accuracy uniquely required | 0.5% of operating range |
| 12 | Hydraulics, each system (low pressure and selection) | | Discrete | 1 | — | — |
| 13 | Outside air temperature | | Sensor range | 2 | ±2°C | 0.3°C |
| 14* | Autopilot/autothrottle/AFCS mode and engagement status | | A suitable combination of discretes | 1 | — | — |
| 15* | Stability augmentation system engagement | | Discrete | 1 | — | — |
| 16* | Main gearbox oil pressure | | As installed | 1 | As installed | 6.895 kN/m² (1 psi) |
| 17* | Main gearbox oil temperature | | As installed | 2 | As installed | 1°C |

| Serial Number | Parameter | Applicability | Measurement Range | Maximum Sampling & Recording Interval (s) | Accuracy Limits (sensor input compared to FDR readout) | Recording Resolution |
|---|---|---|---|---|---|---|
| 18 | Yaw rate | | ±400°/second | 0.25 | ±1.5% maximum range excluding datum error of ±5% | ±2°/s |
| 19* | Sling load force | | 0 to 200% of certified load | 0.5 | ±3% of maximum range | 0.5% for maximum certified load |
| 20 | Longitudinal acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 21 | Lateral acceleration | | ±1 g | 0.25 | ±0.015 g excluding a datum error of ±0.05 g | 0.004 g |
| 22* | Radio altitude | | −6 m to 750 m (−20 ft to 2 500 ft) | 1 | ±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft) | 0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft) |
| 23* | Vertical beam deviation | | Signal range | 1 | ±3% | 0.3% of full range |
| 24* | Horizontal beam deviation | | Signal range | 1 | ±3% | 0.3% of full range |
| 25 | Marker beacon passage | | Discrete | 1 | — | — |
| 26 | Warnings | | Discrete(s) | 1 | — | — |
| 27 | Each navigation receiver frequency selection | | Sufficient to determine selected frequency | 4 | As installed | — |
| 28* | DME 1 and 2 distances | | 0–370 km (0–200 NM) | 4 | As installed | 1 852 m (1 NM) |
| 29* | Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction) | | As installed | 2 | As installed | As installed |
| 30* | Landing gear and gear selector position | | Discrete | 4 | — | — |
| 31* | Engine exhaust gas temperature (T4) | | As installed | 1 | As installed | — |
| 32* | Turbine inlet temperature (TIT/ITT) | | As installed | 1 | As installed | — |
| 33* | Fuel contents | | As installed | 4 | As installed | — |
| 34* | Altitude rate | | As installed | 1 | As installed | — |
| 35* | Ice detection | | As installed | 4 | As installed | — |
| 36* | Helicopter health and usage monitor system | | As installed | — | As installed | — |
| 37 | Engine control modes | | Discrete | 1 | — | — |
| 38* | Selected barometric setting (pilot and copilot) | | As installed | 64 (4 recommended) | As installed | 0.1 mb (0.003 in Hg) |

| Serial Number | Parameter | Applicability | Measurement Range | Maximum Sampling & Recording Interval (s) | Accuracy Limits (sensor input compared to FDR readout) | Recording Resolution |
|---|---|---|---|---|---|---|
| 39* | Selected altitude (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 40* | Selected speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 41* | Selected Mach (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 42* | Selected vertical speed (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 43* | Selected heading (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 44* | Selected flight path (all pilot selectable modes of operation) | | As installed | 1 | As installed | Sufficient to determine crew selection |
| 45* | Selected decision height | | As installed | 4 | As installed | Sufficient to determine crew selection |
| 46* | EFIS display format (pilot and co-pilot) | | Discrete(s) | 4 | — | — |
| 47* | Multi-function/engine/alerts display format | | Discrete(s) | 4 | — | — |
| 48* | Event marker | | Discrete | 1 | — | — |
| 49* | GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) and (operational status) | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s) | 1 | As installed | — |
| 50* | TCAS/ACAS (traffic alert and collision avoidance system) and (operational status) | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Discrete(s) | 1 | As installed | — |
| 51* | Primary flight controls – pilot input forces | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | Full range | 0.125 (0.0625 recommended) | ±3% unless higher accuracy is uniquely required | 0.5% of operating range |

| Serial Number | Parameter | Applicability | Measurement Range | Maximum Sampling & Recording Interval (s) | Accuracy Limits (sensor input compared to FDR readout) | Recording Resolution |
|---|---|---|---|---|---|---|
| 52* | Computed centre of gravity | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |
| 53* | Helicopter computed weight | Application for type certification is submitted to a Contracting State on or after 1 January 2023 | As installed | 64 | As installed | 1% of full range |

**Table A2.3-~~2~~3. Description of applications for data link recorders**

| No. | Application type | Application description | Recording content |
|---|---|---|---|
| 1 | Data link initiation | This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM), respectively. | C |
| 2 | Controller-pilot communication | This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances. | C |
| 3 | Addressed surveillance | This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | C |
| 4 | Flight information | This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services. | C |
| 5 | Aircraft broadcast surveillance | This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the aircraft ~~aeroplane~~ are reported within the message they shall be recorded unless data from the same source are recorded on the FDR. | M* |
| 6 | Aeronautical operational control data | This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control). | M* |

***Key:***

***C****: Complete contents recorded.*

***M****: Information that enables correlation to any associated records stored separately from the aeroplane.*

****: Applications that are to be recorded only as far as is practicable given the architecture of the system.*

## Table A2.3-4. Parameter characteristics for aircraft data recording systems – Aeroplanes

| No. | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| 1a | Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | Heading is preferred; if not available, yaw rate shall be recorded |
| 1b | Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2a | Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | Pitch attitude is preferred; if not available, pitch rate shall be recorded |
| 2b | Pitch rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3a | Roll attitude | ±180° | 0.25 | ±2° | 0.5° | If not available, roll rate shall be recorded |
| 3b | Roll rate | 300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4a | Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available |
| 4b | Latitude/Longitude | Latitude: ±90°<br>Longitude: ±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| 4c | Altitude | −300 m (−1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft) | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |
| 4d | Ground speed | 0–1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |
| 4e | Track | 0–360° | 2 (1 if available) | As installed (±2° recommended) | 0.5° | |

| No. | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| 4f | Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | −3 g to +6 g (*) | 0.25 (0.125 if available) | As installed (±0.09 g excluding datum error of ±0.45 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g (*) | 0.25 (0.125 if available) | As installed (±0.015 g excluding datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (~~3.44~~1.02 in-Hg) to 310.2 mb (~~31.02~~9.16 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.~~1~~ 03 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended) | 0.1 mb (0.~~01~~ 03 in-Hg) or 1.5 m (5 ft) | |
| 9 | Outside air temperature (or total air temperature) | −50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Engine RPM | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | |

| No. | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| 12 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 13 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 15 | Manifold pressure | Full range | Each engine each second | As installed | 0.2% of full range | |
| 16 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | Sufficient parameters (e.g., EPR/N1 or torque/Np) shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided. |
| 17 | Engine gas generator speed (Ng) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 18 | Free power turbine speed (Nf) | 0–150% | Each engine each second | As installed | 0.2% of full range | |
| 19 | Coolant temperature | Full range | 1 | As installed (±5°C recommended) | 1°C | |
| 20 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 21 | Cylinder head temperature | Full range | Each cylinder each second | As installed | 2% of full range | |
| 22 | Flaps position | Full range or each discrete position | 2 | As installed | 0.5° | |
| 23 | Primary flight control | Full range | 0.25 | As installed | 0.2% of full range | |

| No. | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| | surface position | | | | | |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |
| 28 | Landing gear position | Each discrete position* | Each gear every 2 seconds | As installed | — | *Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

## Table A2.3-5. Parameter characteristics for aircraft data recording systems – Helicopters

| N° | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| 1 a) | Heading:<br>Heading (Magnetic or True) | ±180° | 1 | ±2° | 0.5° | *Heading is preferred; if not available, yaw rate shall be recorded |
| 1 b) | Heading:<br>Yaw rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 2 a) | Pitch:<br>Pitch attitude | ±90° | 0.25 | ±2° | 0.5° | *Pitch attitude is preferred; if not available, pitch rate shall be recorded |
| 2 b) | Pitch:<br>Pitch rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 3 a) | Roll:<br>Roll attitude | ±180° | 0.25 | ±2° | 0.5° | *Roll attitude is preferred; if not available, roll rate shall be recorded |
| 3 b) | Roll:<br>Roll rate | ±300°/s | 0.25 | ±1% + drift of 360°/h | 2°/s | |
| 4 a) | Positioning system:<br>Time | 24 hours | 1 | ±0.5 s | 0.1 s | UTC time preferred where available |
| 4 b) | Positioning system:<br>Latitude/Longitude | Latitude: ±90°<br>Longitude: ±180° | 2 (1 if available) | As installed (0.00015° recommended) | 0.00005° | |
| 4 c) | Positioning system:<br>Altitude | −300 m (−1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft) | 2 (1 if available) | As installed (±15 m (±50 ft) recommended) | 1.5 m (5 ft) | |
| 4 d) | Positioning system:<br>Ground speed | 0–1 000 kt | 2 (1 if available) | As installed (±5 kt recommended) | 1 kt | |
| 4 e) | Positioning system:<br>Track | 0–360° | 2 (1 if available) | As installed (±2° recommended) | 0.5° | |
| 4 f) | Positioning system:<br>Estimated error | Available range | 2 (1 if available) | As installed | As installed | Shall be recorded if readily available |
| 5 | Normal acceleration | −3 g to +6 g | 0.25 (0.125 if available) | As installed (±0.09 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 6 | Longitudinal acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 7 | Lateral acceleration | ±1 g | 0.25 (0.125 if available) | As installed (±0.015 g excluding a datum error of ±0.05 g recommended) | 0.004 g | |
| 8 | External static pressure (or pressure altitude) | 34.4 mb (1.02 in-Hg) to 310.2 mb (9.16 in-Hg) or available sensor range | 1 | As installed (±1 mb (0.3 in-Hg) or ±30 m (±100 ft) to | 0.1 mb (0.003 in-Hg) or 1.5 m (5 ft) | |

| N° | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| | | | | ±210 m (±700 ft) recommended) | | |
| 9 | Outside air temperature (or total air temperature) | −50° to +90°C or available sensor range | 2 | As installed (±2°C recommended) | 1°C | |
| 10 | Indicated air speed | As the installed pilot display measuring system or available sensor range | 1 | As installed (±3% recommended) | 1 kt (0.5 kt recommended) | |
| 11 | Main rotor speed (Nr) | 50% to 130% or available sensor range | 0.5 | As installed | 0.3% of full range | |
| 12 | Engine RPM (*) | Full range including overspeed condition | Each engine each second | As installed | 0.2% of full range | *For piston-engined helicopters |
| 13 | Engine oil pressure | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 14 | Engine oil temperature | Full range | Each engine each second | As installed (5% of full range recommended) | 2% of full range | |
| 15 | Fuel flow or pressure | Full range | Each engine each second | As installed | 2% of full range | |
| 16 | Manifold pressure (*) | Full range | Each engine each second | As installed | 0.2% of full range | *For piston-engined helicopters |
| 17 | Engine thrust/power/torque parameters required to determine propulsive thrust/power* | Full range | Each engine each second | As installed | 0.1% of full range | *Sufficient parameters (e.g., EPR/N1 or torque/Np) shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine-engined helicopters. |
| 18 | Engine gas generator speed (Ng) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 19 | Free power turbine speed (Nf) (*) | 0–150% | Each engine each second | As installed | 0.2% of full range | *Only for turbine-engined helicopters |
| 20 | Collective pitch | Full range | 0.5 | As installed | 0.1% of full range | |
| 21 | Coolant temperature (*) | Full range | 1 | As installed (±5°C recommended) | 1°C | *Only for piston-engined helicopters |
| 22 | Main voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 23 | Cylinder head temperature (*) | Full range | Each cylinder each second | As installed | 2% of full range | *Only for piston-engined helicopters |
| 24 | Fuel quantity | Full range | 4 | As installed | 1% of full range | |
| 25 | Exhaust gas temperature | Full range | Each engine each second | As installed | 2% of full range | |
| 26 | Emergency voltage | Full range | Each engine each second | As installed | 1 Volt | |
| 27 | Trim surface position | Full range or each discrete position | 1 | As installed | 0.3% of full range | |

| N° | Parameter Name | Minimum Recording Range | Maximum Recording Interval (s) | Minimum Recording Accuracy | Minimum Recording Resolution | Remarks |
|---|---|---|---|---|---|---|
| 28 | Landing gear position | Each discrete position* | Each gear every two seconds | As installed | — | *Where available, record up-and-locked and down-and-locked position |
| 29 | Novel/unique aircraft features | As required | As required | As required | As required | |

# APPENDIX 2.4 GENERAL AVIATION SPECIFIC APPROVALS

(Section 2, Chapter 2.1, 2.1.4, refers)

## 1. PURPOSE AND SCOPE

1.1 Specific approvals shall have a standardized format which contains the minimum information required in the specific approval template.

***Note**. When the operations to be conducted require a specific approval, a copy of the document(s) needs to be carried on board (see 2.4.2.2).*

## 2. SPECIFIC APPROVAL TEMPLATE

| SPECIFIC APPROVAL | | | | |
|---|---|---|---|---|
| **ISSUING AUTHORITY and CONTACT DETAILS**[1] | | | | |
| Issuing Authority[1] _____<br>Address _____<br>Signature: _____ Date[2]: _____<br>Telephone: _____ Fax: _____ Email: _____ | | | | |
| **OWNER/OPERATOR** | | | | |
| Name[3]: _____ Address: _____<br>Telephone: _____ Fax: _____ Email: _____ | | | | |
| Aircraft model[4] and registration marks: | | | | |
| **SPECIFIC APPROVAL** | **YES** | **NO** | **DESCRIPTION**[5] | **REMARKS** |
| Low visibility operations | | | | |
| Approach and landing | □ | □ | CAT[6]: _____ RVR: _____ m<br>DH: _____ ft | |
| Take-off | □ | □ | RVR[7]: _____ m | |
| Operational credit(s) | □ | □ | [8] | |
| RVSM | □ | □ | | |
| AR navigation specifications for PBN operations | □ | □ | [9] | |
| EFB | □ | □ | [10] | |
| Other [11] | □ | □ | | |

***Notes.***

*1. Civil Aviation Authority name and contact details, including the telephone country code and email if available.*

*2. Issuance date of the specific approval (dd-mm-yyyy) and signature of the authority representative.*

*3. Owner or operator's name and address.*

*4. Insert the aircraft ~~aeroplane~~ make, model and series, or master series, if a series has been designated. The CAST/ICAO taxonomy is available at: http://www.intlaviationstandards.org/.*

*5. List in this column the most permissive criteria for each specific approval (with appropriate criteria).*

*6. Insert the applicable precision approach category (CAT II, III). Insert the minimum RVR in metres and decision height in feet. One line is used per listed approach category.*

*7. Insert the approved minimum take-off RVR in metres, or the equivalent horizontal visibility if RVR is not used. One line per approval may be used if different approvals are granted.*

*8. List the airborne capabilities (e.g. automatic landing, HUD, EVS, SVS, CVS) and associated operational credit(s) granted.*

*9. Performance-based navigation (PBN): one line is used for each PBN AR navigation specification approval (e.g. RNP AR APCH), with appropriate limitations listed in the "Description" column.*

*10. List the EFB functions used for the safe operation of aircraft ~~aeroplanes~~ and any applicable limitations*

*11. Other specific approvals or data can be entered here, using one line (or one multi-line block) per approval (e.g. specific approach operations approval).*

# APPENDIX 2.5 ARTICLE 83 bis AGREEMENT SUMMARY

(Chapter 2.4, 2.4.18.4, refers)

***Note**. Chapter 2.4, 2.4.18.1, requires a certified true copy of the agreement summary to be carried on board.*

## 1. PURPOSE AND SCOPE

The Article 83 bis agreement summary should contain the information in the template at paragraph 2, in a standardized format.

## 2. ARTICLE 83 bis AGRE EMENT SUMMARY

| ARTICLE 83 *bis* AGREEMENT SUMMARY | | | |
|---|---|---|---|
| Title of the Agreement: | | | |
| State of Registry: | | Focal point: | |
| State of the principal location of a general aviation operator: | | Focal point: | |
| Date of signature: | By State of Registry[1]:<br>By State of the principal location of a general aviation operator[1]: | | |
| Duration: | Start Date[1]: | End Date (if applicable)[2]: | |
| Languages of the Agreement | | | |
| ICAO Registration No.: | | | |
| Umbrella Agreement (if any) with ICAO Registration number: | | | |

| **Convention on International Civil Aviation** | **ICAO Annexes affected by the transfer of responsibility in respect of certain functions and duties to the State of the principal location of a general aviation operator** | | |
|---|---|---|---|
| Article 12: Rules of the air | Annex 2, all chapters | Yes □<br>No □ | |
| Article 30 a): Aircraft radio equipment | Radio Station Licence | Yes □<br>No □ | |
| Articles 30 b) and 32 a): Licenses of personnel | Annex 1, Chapters 1, 2, 3 and 6; and<br>Annex 6, Part I, Radio Operator; or<br>Annex 6, Part II (qualifications and/or flight crew member licensing); or<br>Annex 6, Part III, Section II (composition of the flight crew) (radio operator~~); or~~<br>~~Annex 6, Part III, Section III (qualifications)~~ | Yes □<br>No □ | Annex 6: [Specify Part and paragraph][3] |
| Article 31: Certificates of Airworthiness | Annex 6<br>Part I or Part III, Section II | Yes □<br>No □ | [Specify Part and chapters][3] |
| | Annex 6<br>Part II~~ or Part III, Section III~~ | Yes □<br>No □ | [Specify Part and chapters][3] |
| | Annex 8<br>Part II, Chapters 3 and 4 | Yes □<br>No □ | [Specify chapters][3] |

| **Aircraft affected by the transfer of responsibilities to the State of the principal location of a general aviation operator** | | | | |
|---|---|---|---|---|
| Aircraft make, | Nationality and | Serial | AOC No. | Dates of transfer of responsibilities |

| model, series | registration marks | No. | (Commercial air transport) | | |
|---|---|---|---|---|---|
| | | | | From[1] | To (if applicable)[2] |
| | | | | | |

***Notes.***

*1. dd/mm/yyyy.*
*2. dd/mm/yyyy or N/A if not applicable.*
*3. Square brackets indicate information that needs to be provided.*

[Specify Chapter][3]

# ATTACHMENT 2.A CARRIAGE AND USE OF OXYGEN

Supplementary to 2.2.3.~~8~~11

**INTRODUCTION**

The performance of crew members and the well-being of passengers during flights at such altitudes where a lack of oxygen might result in impairment of faculties are of major concern. Research conducted in altitude chambers or by exposure to mountain elevations indicates that human tolerance could be related to the altitude concerned and the exposure time. The subject is dealt with in detail in the ICAO Manual of Civil Aviation Medicine (Doc 8984). In light of the above and to further assist the pilotin- command in providing the oxygen supply intended by 2.2.3.~~8~~ 11 of this ~~Annex~~KCASR Part, the following guidelines, which take into account the requirements already established in Annex 6, Part I, are considered relevant.

**1. OXYGEN SUPPLY**

1.1 A flight to be operated at altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa should not be commenced unless sufficient stored breathing oxygen is carried to supply:

a) all crew members and at least 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and

b) all crew members and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

1.2 A flight to be operated with a pressurized aircraft ~~aeroplane~~ should not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aircraft ~~aeroplane~~ is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

**2. USE OF OXYGEN**

2.1 All flight crew members, when engaged in performing duties essential to the safe operation of an aircraft ~~aeroplane~~ in flight, should use breathing oxygen continuously whenever the circumstances prevail for which its supply has been indicated to be necessary in 1.1 or 1.2.

2.2 All flight crew members of pressurized aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa should have available at the flight duty station a quick donning type of mask which will readily supply oxygen upon demand.

***Note**. Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text are as follows:*

| *Absolute pressure* | *Metres* | *Feet* |
|---|---|---|

| | | |
|---|---|---|
| *700 hPa* | *3000* | *10000* |
| *620 hPa* | *4000* | *13000* |
| *376 hPa* | *7000* | *25000* |

# ATTACHMENT 2.B GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

Supplementary to Chapter 2, 2.4.16

## INTRODUCTION

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, new and revised requirements were introduced concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, were complex.

The tables below summarize the current flight recorders carriage requirements.

**Table A2.C-1. SARPs for the recording of flight parameters, Aeroplanes**

| Date | Maximum certificated take-off mass (MCTOM) |
|---|---|
| | 5 700 kg and below |
| | All turbine-engined aeroplanes with more than five passengers – first certificate of airworthiness |
| **2016 onwards** | 2.4.16.1.1.1 |

**Table A2.C-2. SARPs for the recording of flight parameters – Helicopters**

| Date | Maximum certificated take-off mass (MCTOM) | |
|---|---|---|
| | Seating configuration of more than 19 passengers or over 7 000 kg | Over 3 175 kg |
| | All helicopters first certificate of airworthiness | All helicopters first certificate of airworthiness |
| **1989 onwards** | 2.4.16.5.1.2 | 2.4.16.5.1.3 |
| **2016 onwards** | 2.4.16.5.1.1 | 2.4.16.5.1.1 |

**Table A2.C-~~2~~3. CVR/CARS installation SARPs, Aeroplanes**

| Date | Maximum certificated take-off mass (MCTOM) |
|---|---|
| | 5 700 kg and below |
| | All turbine-engined aeroplanes with more than five passengers required to be operated by more than one pilot – first certificate of airworthiness |
| **2016 onwards** | 2.4.16.2.1 |

**Table A2.C-4. CVR/CARS installation SARPs, Helicopters**

| Date | Maximum certificated take-off mass (MCTOM) | |
|---|---|---|
| | Over 7 000 kg | Over 3 175 kg |
| | All helicopters | All helicopters first certificate of airworthiness |
| **1987 onwards** | 2.4.16.6.1.1 | 2.4.16.6.1.2 |

# ICAO ANNEX 6 — PART II SECTION 3 LARGE AND TURBOJET AEROPLANES

## CHAPTER 3.1 APPLICABILITY

3.1.1 The following operations shall be subject to the Standards and Recommended Practices of Section 2, and those of Section 3:

International general aviation operations with:

a) aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; or

b) aeroplanes equipped with one or more turbojet engines.

3.1.2 An operation involving an aeroplane with a seating configuration of more than 9 passenger seats should be conducted in accordance with Section 3.

***Note.*** *The applicability of 3.1 does not preclude a general aviation operator from satisfying the requirements of Section 3 where it may be to the operator's advantage.*

## CHAPTER 3.2 CORPORATE AVIATION OPERATIONS

A corporate aviation operation involving three or more aircraft that are operated by pilots employed for the purpose of flying the aircraft should be conducted in accordance with Section 3.

***Note.*** *The term "aircraft" is used to indicate that a corporate aviation operation using a mix of aeroplanes and helicopters is subject to this Recommendation as long as at least one aeroplane is involved.*

## CHAPTER 3.3 GENERAL

### 3.3.1 Compliance with laws, regulations and procedures

3.3.1.1 The operator shall ensure that all employees know that they must comply with the laws, regulations and procedures of those States in which operations are conducted.

***Note****. Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.*

3.3.1.2 The operator shall ensure that all pilots are familiar with the laws, regulations and procedures, pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating thereto. The operator shall ensure that other members of the flight crew are familiar with such of these laws, regulations

and procedures as are pertinent to the performance of their respective duties in the operation of the aeroplane.

3.3.1.3 The pilot-in-command is responsible for operational control. The operator shall describe the operational control system in the operations manual and identify the roles and responsibilities of those involved with the system.

***Note**. The rights and obligations of a State in respect to the operation of aeroplanes registered in that State are not affected by this provision.*

3.3.1.4 The operator shall ensure that the pilot-in-command has available on board the aeroplane all the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

***Note**. This information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate.*

3.3.1.5 The operator shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in Annex 1.

**3.3.2 Safety management**

***Note**. Annex 19 includes safety management provisions for international general aviation operators of large or turbojet aeroplanes. Further guidance is contained in the ICAO Safety Management Manual (SMM) (Doc 9859).*

3.3.2.1 Until 22 November 2028, States shall not allow the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are:

a) related to a safety-related event identified in the context of a safety management system; are restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by Annex 19;

b) sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by Annex 19; or

c) used for inspections of flight recorder systems as provided in Section 7 of Appendix 2.3.

***Note**. Provisions on the protection of safety data, safety information and related sources are contained in Appendix 3 to Annex 19. When an investigation under Annex 13 is instituted, investigation records are subject to the protections accorded by Annex 13.*

3.3.2.2 Until 22 November 2028, States shall not allow the use of recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are subject to the protections accorded by Annex 19 and are:

a) used by the operator for airworthiness or maintenance purposes;

b) sought for use in proceedings not related to an event involving an accident or incident investigation;

c) de-identified; or

d) disclosed under secure procedures.

***Note**. Provisions on the protection of safety data, safety information and related sources are contained in Appendix 3 to Annex 19.*

**3.3.3 PROTECTION OF RECORDINGS AND TRANSCRIPTS Applicable as of 23 November 2028.**

3.3.3.1 States shall not allow the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are:

a) used in the investigation of an accident or incident instituted under Annex 13;

b) related to used in the assessment of a safety-related event identified in the context of a safety management system; are, in which case such use is restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by Annex 19;

c) sought for use in criminal proceedings not related to an event involving an Annex 13 accident or incident investigation and are subject to the protections accorded by Annex 19, in which case such use is restricted to the relevant portions disclosed under authoritative safeguards; or

d) used for inspections of flight recorder systems as provided in Section 76 of Appendix 2.3.

***Note 1.** When an investigation under Annex 13 is instituted, the protection accorded to accident and investigation records, including recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS, is determined in accordance with Annex 13. Provisions on the protection of safety data, and safety information collected for purposes of maintaining or improving safety, and as well as related sources are contained in Appendix 3 to Annex 19. When an investigation under Annex 13 is instituted, investigation records are subject to the protections accorded by Annex 13.*

***Note 2**. Authoritative safeguards include legal limitations or restrictions such as protective orders, closed proceedings, in-camera review, and de-identification of data for the use or disclosure of safety information in criminal proceedings.*

3.3.3.2 States shall not allow the use of recordings or transcripts of FDR, ADRS, Class B and C AIR, and Class B and C AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are subject to the protections accorded

by Annex 19 and are:

a) used in the investigation of an accident or incident instituted under Annex 13;

b) used by the operator for airworthiness or maintenance purposes; or

c) sought for use in proceedings not related to an event involving an accident or incident investigation;

***Note**. Provisions on the protection of safety data, and safety information collected for purposes of maintaining or improving safety, and as well as related sources are contained in Appendix 3 to Annex 19*

**CHAPTER 3.4 FLIGHT OPERATIONS**

**3.4.1 Operating facilities**

3.4.1.1 The operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the aeroplane, are adequate for the type of operation under which the flight is to be conducted.

***Note**. "Reasonable means" in this Standard is intended to denote the use, at the point of departure, of information available to the operator either through official information published by the aeronautical information services or readily obtainable from other sources.*

3.4.1.2 The operator, in making a decision on the adequacy of facilities and services available at an aerodrome of intended operation, shall assess the level of safety risk associated with the aircraft type and nature of the operation, in relation to the availability of rescue and firefighting services (RFFS).

**3.4.2 Operational management**

3.4.2.1 Operator notification

3.4.2.1.1 If the operator has an operating base in a State other than the State of Registry, the operator shall notify the State in which the operating base is located.

3.4.2.1.2 Upon notification in accordance with 3.4.2.1.1, safety and security oversight shall be coordinated between the State in which the operating base is located and the State of Registry.

3.4.2.2 Operations manual

The operator shall provide, for the use and guidance of personnel concerned, an operations manual containing all the instructions and information necessary for operations personnel to perform their

duties. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be issued to all personnel that are required to use this manual.

***Note 1**. States may reference accepted and recognized industry codes of practice as the basis for the development of an operations manual.*

***Note 2**. Attachment 3.A contains guidance on the organization and content of an operations manual.*

3.4.2.3 Operating instructions — general

3.4.2.3.1 The operator shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

3.4.2.3.2 The operator should issue operating instructions and provide information on aeroplane climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. This information should be included in the operations manual.

3.4.2.4 In-flight simulation of emergency situations

The operator shall ensure that when passengers are being carried, no emergency or abnormal situations shall be simulated.

3.4.2.5 Checklists

Checklists shall be used by flight crews prior to, during and after all phases of operations, and in emergencies, to ensure compliance with the operating procedures contained in the aircraft operating manual and the aeroplane flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual. The design and utilization of checklists shall observe Human Factors principles.

***Note**. Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

3.4.2.6 Minimum flight altitudes

The operator shall specify, for flights which are to be conducted in accordance with the instrument flight rules, the method of establishing terrain clearance altitudes.

3.4.2.7 Aerodrome operating minima

The operator shall establish aerodrome operating minima, in accordance with criteria specified by the State of Registry, for each aerodrome to be used in operations. When establishing aerodrome operating minima, any conditions that may be prescribed in the list of specific approvals shall be observed. Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that

State.

***Note**. This Standard does not require the State of the Aerodrome to establish aerodrome operating minima.*

3.4.2.8 Fatigue management programme

The operator shall establish and implement a fatigue management programme that ensures that all operator personnel involved in the operation and maintenance of aircraft do not carry out their duties when fatigued. The programme shall address flight and duty times and be included in the operations manual.

***Note**. Guidance on fatigue management programmes can be found in Manual for the Oversight of Fatigue Management Approaches (Doc 9966).~~the Fatigue Management Manual for General Aviation (ICAO Doc 10033)~~.*

3.4.2.9 Passengers

3.4.2.9.1 The operator shall ensure that passengers are made familiar with the location and use of:

a) seat belts;

b) emergency exits;

c) life jackets, if the carriage of life jackets is prescribed;

d) oxygen dispensing equipment, if the provision of oxygen for the use of passengers is prescribed; and

e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

3.4.2.9.2 The operator shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

3.4.2.9.3 The operator shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

3.4.2.9.4 The operator shall ensure that during take-off and landing and whenever considered necessary, by reason of turbulence or any emergency occurring during flight, all passengers on board an aeroplane are secured in their seats by means of the seat belts or harnesses provided.

3.4.3 Flight preparation

3.4.3.1 The operator shall develop procedures to ensure that a flight is not commenced unless:

a) the aeroplane is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the aeroplane;

b) the instruments and equipment installed in the aeroplane are appropriate, taking into

account the expected flight conditions;

c) any necessary maintenance has been performed in accordance with Chapter 3.8;

d) the mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;

e) any load carried is properly distributed and safely secured; and

f) the aeroplane operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.

3.4.3.2 The operator should make available sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

3.4.3.3 Operational flight planning the operator shall specify flight planning procedures to provide for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned. These procedures shall be included in the operations manual.

***Note 1****. It is the practice in some States to declare, for flight planning purposes, higher minima for an aerodrome nominated as an alternate, than for the same aerodrome planned as that of intended landing.*

***Note 2****. The requirements for flight plans are contained in Annex 2 — Rules of the Air and the procedures relating to flight plans and associated services are contained in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444).*

***Note 3****. Detailed guidance on the use of the FF-ICE services, including the use of a preliminary flight plan, can be found in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (Doc 9965).*

3.4.3.4 Alternate aerodromes

3.4.3.4.1 Take-off alternate aerodrome

3.4.3.4.1.1 A take-off alternate aerodrome shall be selected and specified in the flight plan if either the meteorological conditions at the aerodrome of departure are below the applicable aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons.

3.4.3.4.1.2 The take-off alternate aerodrome shall be located within the following flight time from the aerodrome of departure:

a) for aeroplanes with two engines, one hour of flight time at a one-engine-inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

b) for aeroplanes with three or more engines two hours of flight time at an all engines operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass.

3.4.3.4.1.3 For an aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the applicable aerodrome operating minima for that operation.

### 3.4.3 Flight preparation

3.4.3.5 Fuel requirements

3.4.3.5.1 An aeroplane shall carry a sufficient amount of usable fuel to complete the planned flight safely and to allow for deviations from the planned operation.

3.4.3.5.2 The amount of usable fuel to be carried shall, as a minimum, be based on:

a) fuel consumption data:

1) provided by the aeroplane manufacturer; or

2) if available, current aeroplane-specific data derived from a fuel consumption monitoring system; and

b) the operating conditions for the planned flight including:

1) anticipated aeroplane mass;

2) NOTAMs;~~Notices to Airmen~~;

3) current meteorological reports or a combination of current reports and forecasts;

4) air traffic services procedures, restrictions and anticipated delays; and

5) the effects of deferred maintenance items and/or configuration deviations.

***Note.*** *Where no specific fuel consumption data exist for the precise conditions of the flight, the aircraft may be operated in accordance with estimated fuel consumption data.*

3.4.3.5.3 The pre-flight calculation of usable fuel required shall include:

a) taxi fuel, which shall be the amount of fuel expected to be consumed before take-off taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;

b) trip fuel, which shall be the amount of fuel required to enable the aeroplane to fly from take-off until landing at the destination aerodrome taking into account the operating conditions of 3.4.3.5.2 b);

c) contingency fuel, which shall be the amount of fuel required to compensate for unforeseen factors. It shall be not less than five per cent of the planned trip fuel;

***Note**. Unforeseen factors are those which could have an influence on the fuel consumption to the destination aerodrome, such as deviations of an individual aeroplane from the expected fuel consumption data, deviations from forecast meteorological conditions, extended delays and deviations from planned routings and/or cruising levels.*

d) destination alternate fuel, which shall be:

1) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:

i) perform a missed approach at the destination aerodrome;

ii) climb to the expected cruising altitude;

iii) fly the expected routing;

iv) descend to the point where the expected approach is initiated; and

v) conduct the approach and landing at the destination alternate aerodrome; or

2) where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 450 m (1 500 ft) above destination aerodrome elevation in standard conditions; or

3) where the aerodrome of intended landing is an isolated aerodrome:

i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 per cent of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less;

or

ii) for a turbine-engined aeroplane, the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel;

e) final reserve fuel, which shall be the amount of fuel on arrival at the destination alternate aerodrome, or the destination aerodrome when no destination alternate aerodrome is required:

1) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes; or

2) for a turbine-engined aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions;

f) additional fuel, which shall be the supplementary amount of fuel required to enable the aircraft to descend as necessary and proceed to land at an alternate aerodrome in the event of engine failure or loss of pressurization based on the assumption that such a failure occurs at the most critical point along the route;

g) discretionary fuel, which shall be the extra amount of fuel to be carried at the discretion of the pilot-in-command.

3.4.3.5.4 Operators should determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure.

3.4.3.5.5 The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.

***Note**. Nothing in 3.4.3.5 precludes the in-flight amendment of a flight plan to re-plan that flight to another aerodrome, provided that the requirements of 3.4.3.5 can be complied with from the point where the flight is re-planned.*

3.4.3.6 In-flight fuel management

3.4.3.6.1 The operator shall establish policies and procedures to ensure that in-flight fuel checks and fuel management are performed.

3.4.3.6.2 The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

***Note**. The protection of final reserve fuel is intended to ensure a safe landing at any aerodrome when unforeseen occurrences may not permit safe completion of an operation as originally planned. Guidance on flight planning including the circumstances that may require re-analysis, adjustment and/or re-planning of the planned operation before take-off or enroute, is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

3.4.3.6.3 The pilot-in-command shall request delay information from ATC when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.

3.4.3.6.4 The pilot-in-command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than the planned final reserve fuel.

***Note**. The declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.*

3.4.3.6.5 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY, MAYDAY, MAYDAY FUEL when the calculated usable fuel estimated to be available upon landing

at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

***Note 1.*** *The planned final reserve fuel refers to the value calculated in 3.4.3.5.3 e) and is the minimum amount of fuel required upon landing at any aerodrome.*

***Note 2.*** *The words "MAYDAY FUEL" describe the nature of the distress conditions as required in Annex 10, Volume II, 5.3.2.1.1, b) 3).*

3.4.3.7 Additional requirements for operations beyond 60 minutes to an en-route alternate aerodrome

When conducting operations beyond 60 minutes from a point on a route to an en-route alternate aerodrome operators should ensure that:

a) en-route alternate aerodromes are identified; and

b) the pilot-in-command has access to current information on the identified en-route alternate aerodromes, including operational status and meteorological conditions.

3.4.3.8 Refuelling with passengers on board

3.4.3.8.1 An aeroplane shall not be refuelled when passengers are embarking, on board or disembarking unless it is properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

3.4.3.8.2 When refuelling with passengers embarking, on board or disembarking, two-way communication shall be maintained by the aeroplane's intercommunication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the aeroplane.

***Note 1****. The provisions of 3.4.3.~~5~~8.1 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refuelling.*

***Note 2.*** *Provisions concerning aircraft refuelling are contained in Annex 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services Manual (ICAO Doc 9137), Parts 1 and 8.*

***Note 3.*** *Additional precautions are required when refuelling with fuels other than aviation kerosene or when refuelling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

3.4.3.9 Oxygen supply

3.4.3.9.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620

hPa; and

b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

3.4.3.9.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

**3.4.4 In-flight procedures**

3.4.4.1 Instrument approaches

In the aircraft operating manual recommended in 3.6.1.2 the operator should include operating procedures for conducting instrument approaches.

3.4.4.2 Use of oxygen

3.4.4.2.1 All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 3.4.3.9.1 or 3.4.3.9.2.

3.4.4.2.2 All flight crew members of pressurized aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which will readily supply oxygen upon demand.

3.4.4.3 Aeroplane operating procedures for noise abatement

3.4.4.3.1 Aeroplane operating procedures for noise abatement should comply with the provisions of PANS-OPS (Doc 8168), Volume I.

3.4.4.3.2 Noise abatement procedures specified by the operator for any one aeroplane type should be the same for all aerodromes.

***Note**. A single procedure may not satisfy the requirements at some aerodromes.*

3.4.4.4 Aeroplane operating procedures for rates of climb and descent

Unless otherwise specified in an air traffic control instruction, to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at or approaching adjacent

altitudes or flight levels, pilots should consider using appropriate procedures to ensure that a rate of climb or descent of less than 8 m/s or 1 500 ft/min (depending on the instrumentation available) is achieved throughout the last 300 m (1 000 ft) of climb or descent to the assigned altitude or flight level, when made aware of another aircraft at or approaching an adjacent altitude or flight level.

***Note.*** *Material concerning the development of these procedures is contained in PANS-OPS (Doc 8168), Volume I, Part III, Section 3, Chapter 3.*

3.4.4.5 Aeroplane operating procedures for landing performance

An approach to land shall not be continued below 300 m (1 000 ft) above aerodrome elevation unless the pilot-in-command is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

***Note 1.*** *The procedures for using runway surface condition information on board aircraft are contained in the PANS Aerodromes (Doc 9981) and in the performance section of the aeroplane flight manual; for aeroplanes certificated in accordance with Annex 8, Part IIIB, in the Aeroplane Performance Manual (ICAO Doc 10064).*

***Note 2****. Guidance on development of aeroplane performance information for aeroplanes certificated in accordance with Annex 8, Part IIIB is contained in the Aeroplane Performance Manual (ICAO Doc 10064).*

**3.4.5 Duties of pilot-in-command**

3.4.5.1 The pilot-in-command shall ensure that the checklists specified in 3.4.2.5 are complied with in detail.

3.4.5.2 The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property. In the event that the pilot-in-command is incapacitated the operator shall take the forgoing action.

***Note****. A definition of the term "serious injury" is contained in Annex 13.*

3.4.5.3 The pilot-in-command shall be responsible for reporting all known or suspected defects in the aeroplane, to the operator, at the termination of the flight.

3.4.5.4 The pilot-in-command shall be responsible for the journey log book or the general declaration containing the information listed in 2.8.2.

***Note****. By virtue of Resolution A10-36 of the Tenth Session of the Assembly (Caracas, June–July 1956) "the General Declaration, [described in Annex 9] when prepared so as to contain all the information required by Article 34 [of the Convention on International Civil Aviation] with respect to the journey log book, may be considered by Contracting States to be an acceptable form of journey* log book".

3.4.6 Cabin baggage (take-off and landing)

The operator shall specify procedures to ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.

## CHAPTER 3.5 AEROPLANE PERFORMANCE OPERATING LIMITATIONS

### 3.5.1 General

For aeroplanes for which Parts IIIA and IIIB of Annex 8 are not applicable because of the exemption provided for in Article 41 of the Convention, the State of Registry should ensure that the level of performance specified in 3.5.2 should be met as far as practicable.

3.5.2 Applicable to aeroplanes certificated in accordance with Parts IIIA and IIIB of ICAO Annex 8 as applicable.

3.5.2.1 The Standards contained in 3.5.2.2 to 3.5.2.9 inclusive are applicable to the aeroplanes to which Parts IIIA and IIIB of Annex 8 are applicable.

***Note**. The Standards of Annex 8 — Airworthiness of Aircraft, Parts IIIA and IIIB, apply to all aeroplanes of over 5 700 kg maximum certificated take-off mass intended for the carriage of passengers or cargo or mail in international air navigation.*

3.5.2.2 An aeroplane shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual.

3.5.2.3 The State of Registry shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under all expected operating conditions, including those not covered specifically by the provisions of this chapter.

3.5.2.4 A flight shall not be commenced unless the performance information provided in the flight manual indicates that the Standards of 3.5.2.5 to 3.5.2.9 can be complied with for the flight to be undertaken.

3.5.2.5 In applying the Standards of this chapter, account shall be taken of all factors that significantly affect the performance of the aeroplane (such as: mass, operating procedures, the pressure altitude appropriate to the elevation of the aerodrome, runway slope, the ambient temperature, wind, and surface conditions of the runway at the expected time of use, i.e. presence of slush, water and/or ice, for landplanes, water surface condition for seaplanes). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.

***Note**. Guidelines for using runway surface condition information on board aircraft in accordance with ~~2.2.4.4~~3.4.4.5 are contained in the PANS-Aerodromes (ICAO Doc 9981) and in the Aeroplane Performance*

*Manual (ICAO Doc 10064).*

3.5.2.6 Mass limitations

a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which 3.5.2.7 is complied with, or the mass at which 3.5.2.8 and 3.5.2.9 are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying 3.5.2.8 and 3.5.2.9 and, in respect of alternate aerodromes, 3.5.2.6 c) and 3.5.2.9.

b) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the flight manual for the pressure altitude appropriate to the elevation of the aerodrome, and if used as a parameter to determine the maximum take-off mass, any other local atmospheric condition.

c) In no case shall the estimated mass for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the maximum landing mass specified in the flight manual for the pressure altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the maximum landing mass, any other local atmospheric condition.

d) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which compliance has been demonstrated with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the State in which the aerodrome is situated.

3.5.2.7 Take-off. The aeroplane shall be able, in the event of a critical engine failing at any point in the take-off, either to discontinue the take-off and stop within either the accelerate-stop distance available or the runway available, or to continue the take-off and clear all obstacles along the flight path by an adequate margin until the aeroplane is in a position to comply with 3.5.2.8.

***Note**. "An adequate margin" referred to in this provision is illustrated by the appropriate examples included in the ICAO Aeroplane Performance Manual (ICAO Doc 10064).*

3.5.2.7.1 In determining the length of the runway available, account shall be taken of the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

3.5.2.8 En route — one engine inoperative. The aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions therefrom, to continue the flight to an aerodrome at which the Standard of 3.5.2.9 can be met, without flying

below the minimum obstacle clearance altitude at any point.

3.5.2.9 Landing. The aeroplane shall, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, be able to land, with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

***Note**. Guidance on appropriate margins for the "at time of landing assessment" are contained in the ICAO Aeroplane Performance Manual (Doc 10064).*

## CHAPTER 3.6 AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

***Note**. Specifications for the provision of aeroplane communication and navigation equipment are contained in Chapter 3.7.*

### 3.6.1 General

3.6.1.1 Where a master minimum equipment list (MMEL) is established for the aircraft type, the operator shall include in the operations manual a minimum equipment list (MEL) approved by the State of Registry of the aeroplane which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

***Note**. Attachment 3.B contains guidance on the minimum equipment list.*

3.6.1.2 The operator should provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual should be consistent with the aircraft flight manual and checklists to be used. The design of the manual should observe Human Factors principles.

***Note**. Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

### 3.6.2 Aeroplanes on all flights

3.6.2.1 In addition to the requirements contained in 2.4.2.2, an aeroplane shall be equipped with:

a) accessible and adequate medical supplies appropriate to the number of passengers the aeroplane is authorized to carry;

b) Medical supplies should comprise one or more first-aid kits.

***Note**. Guidance on the types, number, location and contents of the medical supplies is given in Annex 6*

c) a safety harness for each flight crew 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;

d) The safety harness for each pilot seat should incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls.

***Note**. Safety harness includes shoulder straps and a seat belt which may be used independently.*

e) means of ensuring that the following information and instructions are conveyed to passengers:

1) when seat belts are to be fastened;

2) when and how oxygen equipment is to be used if the carriage of oxygen is required;

3) restrictions on smoking;

4) location and use of life jackets or equivalent individual flotation devices where their carriage is required;

5) location of emergency equipment; and

6) location and method of opening emergency exits.

3.6.2.2 An aeroplane shall carry:

a) the operations manual prescribed in 3.4.2.2, or those parts of it that pertain to flight operations;

b) the flight manual for the aeroplane, or other documents containing performance data required for the application of Chapter 3.5 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and

c) the checklists to which 3.4.2.5 refers.

**3.6.3 Flight recorders**

3.6.3.1 Flight data recorders

3.6.3.1.1 Applicability

3.6.3.1.1.1 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2005 shall be equipped with an FDR which shall record at least 78 parameters listed in Table A2.3-1 of Appendix 2.3.

3.6.3.1.1.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 32 parameters listed in Table A2.3-

1 of Appendix 2.3.

3.6.3.1.1.3 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with an FDR which should record at least the first 16 parameters listed in Table A2.3-1 of Appendix 2.3.

3.6.3.2 Cockpit voice recorders

3.6.3.2.1 Applicability

3.6.3.2.1.1 All turbine-engined aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with a CVR.

3.6.3.2.1.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR.

3.6.3.2.1.3 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1987, should be equipped with a CVR.

3.6.3.2.2 Duration

3.6.3.2.2.1 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2022 shall be equipped with a CVR capable of retaining the information recorded during at least the last 25 hours of its operation.

3.6.3.3 Combination recorders

All aeroplanes of a maximum certificated take-off mass over 5 700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders (FDR/CVR).

3.6~~.3~~.4 Aeroplanes on long-range over-water flights

3.6~~.3~~.4.1 The operator of an aeroplane operated on an extended flight over water shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching. The operator shall take into account the operating environment and conditions such as, but not limited to, sea state and sea and air temperatures, the distance from land suitable for making an emergency landing, and the availability of search and rescue facilities. Based upon the assessment of these risks, the operator shall, in addition to the equipment required in 2.4.4.3, ensure that the aeroplane is appropriately equipped with:

a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to

facilitate their ready use in emergency, provided with such lifesaving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and

b) equipment for making the distress signals described in Annex 2.

3.6.~~3~~.4.2 Each life jacket and equivalent individual flotation device, when carried in accordance with 2.4.4.3, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of 2.4.4.3.1 is met by the provision of individual flotation devices other than life jackets.

3.6.~~3~~.5 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1990.

3.6.~~3~~.5.1 Pressurized aeroplanes intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

3.6.~~3~~.5.2 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 3.4.3.9.1.

3.6.~~3~~.5.3 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 3.4.3.9.2.

**3.6.4 Aeroplanes in icing conditions**

Aeroplanes shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

**3.6.5 Aeroplanes operated in accordance with the instrument flight rules**

3.6.5.1 In addition to the requirements contained in 2.4.7, aeroplanes when operated in accordance with the instrument flight rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with two independent altitude measuring and display systems.

3.6.5.2 Aeroplanes over 5 700 kg — Emergency power supply for electrically operated attitude indicating instruments

3.6.5.2.1 Aeroplanes of a maximum certificated take-off mass of over 5 700 kg newly introduced into service after 1 January 1975 shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for

a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the pilot-in-command. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

3.6.5.2.2 Aircraft with advanced cockpit automation systems (glass cockpits) should have system redundancy that provides the flight crew with attitude, heading, airspeed and altitude indications in case of failure of the primary system or display.

3.6.5.2.3 Instruments that are used by any one pilot shall be so arranged as to permit the pilot to see their indications readily from his or her station, with the minimum practicable deviation from the position and line of vision normally assumed when looking forward along the flight path.

**3.6.6 Pressurized aeroplanes when carrying passengers — weather-detecting equipment**

Pressurized aeroplanes when carrying passengers shall be equipped with operative weather-detecting equipment capable of detecting thunderstorms whenever such aeroplanes are being operated in areas where such conditions may be expected to exist along the route either at night or under instrument meteorological conditions.

**3.6.7 Aeroplanes operated above 15 000 m (49 000 ft) — radiation indicator**

Aeroplanes intended to be primarily operated above 15 000 m (49 000 ft) should carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit of the equipment shall be readily visible to a flight crew member.

***Note**. The equipment is calibrated on the basis of assumptions acceptable to the appropriate national authorities.*

**3.6.~~8~~ 10 Aeroplanes carrying passengers — cabin crew seats**

3.6.8.1 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1981 Aeroplanes shall be equipped with a forward or rearward facing seat (within 15 degrees of the longitudinal axis of the aeroplane), fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 3.12.1 in respect of emergency evacuation.

3.6.~~8~~10.2 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1981

3.6.~~8~~10.2.1 Aeroplanes should be equipped with a forward or rearward facing seat (within 15 degrees of the longitudinal axis of the aeroplane), fitted with a safety harness for the use of each

cabin crew member required to satisfy the intent of 3.12.1 in respect of emergency evacuation.

***Note.*** *Safety harness includes shoulder straps and a seat belt which may be used independently. 3.6.8.2.2 Cabin crew seats provided in accordance with 3.6.8.1 or 3.6.8.2.1 shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.*

**3.6.~~9~~ 11 Aeroplanes required to be equipped with an airborne collision avoidance system (ACAS)**

3.6.~~9~~11.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg, or authorized to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 24 November 2005, should be equipped with an airborne collision avoidance system (ACAS II).

3.6.~~9~~11.2 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg, or authorized to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 1 January 2007, shall be equipped with an airborne collision avoidance system (ACAS II).

3.6.~~9~~11.3 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg but not exceeding 15 000 kg, or authorized to carry more than 19 passengers, for which the individual airworthiness certificate is first issued after 1 January 2008, should be equipped with an airborne collision avoidance system (ACAS II).

**3.6.~~10~~ 12 Aeroplanes required to be equipped with a pressure-altitude reporting transponder**

Aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.

***Note****. This provision is intended to improve the effectiveness of air traffic services as well as airborne collision avoidance systems.*

**3.6.13 Turbine aeroplane - Runway overrun awareness and alerting system (ROASS)**

All turbine-engined aeroplanes 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 1 January 2030, should be equipped with a runway overrun awareness and alerting system (ROAAS).

*Note 1. An example of relevant guidance material related to ROAAS may be found in EUROCAE ED-250, Minimum Operation Performance Specification (MOPS) for Runway Overrun Awareness and Alerting System (ROAAS).*

*Note 2. Operator requirements for the use of a ROAAS are contained in PANS-OPS, Volume III, Section 11.*

**3.6.~~11~~ 14 Microphones**

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

## CHAPTER 3.7 AEROPLANE COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

### 3.7.1 Communication equipment

In addition to the requirements of 2.5.1.1 to 2.5.1.5, an aeroplane shall be provided with radio communication equipment capable of:

a) conducting two-way communication for aerodrome control purposes;

b) receiving meteorological information at any time during flight; and

c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

***Note**. The requirements of 3.7.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.*

### 3.7.2 Installation

The equipment installation shall be such that the failure of any single unit required for communications, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communications, navigation or surveillance purposes.

### 3.7.3 Electronic navigation data management

3.7.3.1 The operator of an aeroplane shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the State of Registry has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment. The State of Registry shall ensure that the operator continues to monitor both the process and products.

***Note**. Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.*

3.7.3.2 The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aeroplanes.

## CHAPTER 3.8 AEROPLANE CONTINUING AIRWORTHINESS

### 3.8.1 Operator's continuing airworthiness responsibilities

3.8.1.1 The operator shall comply with the requirements of 2.6.1.

3.8.1.2 The operator should ensure that all maintenance personnel receive initial and continuation training acceptable to the State of Registry and appropriate to their assigned tasks and responsibilities. This should include Human Factors and coordination with other maintenance personnel and flight crew.

***Note**. Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

### 3.8.2 Operator's maintenance control manual

The operator should provide a maintenance control manual, as specified in 3.11.1, for the use and guidance of maintenance and operations personnel. The design of the manual should observe Human Factors principles.

***Note 1.** Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

***Note 2.** States may provide guidance material as outlined in 3.11.2 or reference accepted industry codes of practice.*

### 3.8.3 Maintenance programme

3.8.3.1 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, acceptable to the State of Registry, containing the information required by 3.11.2. The design and application of the operator's maintenance programme shall observe Human Factors principles.

***Note**. Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

3.8.3.2 Copies of all amendments to the maintenance programme shall be furnished promptly to all organizations or persons to whom the maintenance programme has been issued.

### 3.8.4 Continuing airworthiness information

The operator of an aeroplane of a maximum certificated take-off mass in excess of 5 700 kg shall, as prescribed by the State of Registry, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness, is transmitted as required by Annex 8, Part II, 4.2.~~3~~ 4.1 f) and 4.2.~~4~~ 5 as applicable.

### 3.8.5 Maintenance release

3.8.5.1 When maintenance is carried out by an approved maintenance organization, the maintenance release shall be issued by the approved maintenance organization in accordance with the provisions of Annex 8, Part II, 6.8 as applicable.

3.8.5.2 When a maintenance is not carried out by an approved maintenance organization, the maintenance release shall be completed and signed by a person appropriately licensed in accordance with Annex 1 to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the Kuwait DGCA.

3.8.5.3 When maintenance is not carried out by an approved maintenance organization, the maintenance release shall include the following:

a) basic details of the maintenance performed;

b) the date such maintenance was completed; and

c) the identity of the person or persons signing the release.

## CHAPTER 3.9 AEROPLANE FLIGHT CREW

### 3.9.1 Composition of the flight crew

3.9.1.1 Designation of pilot-in-command for each flight the operator shall designate a pilot to act as pilot-in-command.

3.9.1.2 Flight engineer

When a separate flight engineer's station is incorporated in the design of an aeroplane, the flight crew shall include at least one flight engineer especially assigned to that station, unless the duties associated with that station can be satisfactorily performed by another flight crew member, holding a flight engineer licence, without interference with regular duties.

### 3.9.2 Flight crew member emergency duties

The operator shall, for each type of aeroplane, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Recurrent training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the aeroplane.

### 3.9.3 Flight crew member training programmes

3.9.3.1 The operator shall establish and maintain a training programme that is designed to ensure that a person who receives training acquires and maintains the competency to perform assigned duties, including skills related to human performance.

3.9.3.2 Ground and flight training programmes shall be established, either through internal programmes or through a training services provider, and shall include or make reference to a syllabus for those training programmes in the company operations manual.

3.9.3.3 The training programme shall include training to competency for all equipment installed.

3.9.3.4 Flight simulators should be used to the maximum extent practicable for initial and annual recurrent training.

### 3.9.4 Qualifications

3.9.4.1 Flight crew member licensing

3.9.4.1.1 The operator shall:

a) ensure that each flight crew member assigned to duty holds a valid licence issued by the State of Registry, or if issued by another Contracting State, rendered valid by the State of Registry;

b) ensure that flight crew members are properly rated; and

c) be satisfied that flight crew members are competent to carry out assigned duties.

3.9.4.1.2 The operator of an aeroplane equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collisions.

***Note 1**. Procedures for the use of ACAS II equipment are specified in the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume I — Flight Procedures. ACAS II Training Guidelines for Pilots are provided in PANS-OPS, Volume I, Attachment A to Part III, Section 3, Chapter 3.*

***Note 2**. Appropriate training, to the satisfaction of the State, to competency in the use of ACAS II equipment and the avoidance of collisions may be evidenced, for example, by:*

*a) possession of a type rating for an aeroplane equipped with ACAS II, where the operation and use of ACAS II are included in the training syllabus for the type rating; or*

*b) possession of a document issued by a training organization or person approved by the State to conduct training for pilots in the use of ACAS II, indicating that the holder has been trained in accordance with the guidelines referred to in Note 1; or*

*c) a comprehensive pre-flight briefing by a pilot who has been trained in the use of ACAS II in accordance with the guidelines referred to in Note 1.*

3.9.4.2 Recent experience — pilot-in-command

The operator shall not assign a pilot to act as pilot-in-command of an aeroplane unless that pilot has made at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

3.9.4.3 Recent experience — co-pilot

The operator shall not assign a co-pilot to operate at the flight controls of an aeroplane during take-off and landing unless that pilot has made at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

3.9.4.4 Pilot proficiency checks

The operator shall ensure that piloting technique and the ability to execute emergency procedures is checked periodically in such a way as to demonstrate the pilot's competence. Where the operation may be conducted under the instrument flight rules, the operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or a representative of the State issuing the pilot licence.

***Note**. The periodicity of the checks referred to in 3.9.4.4 is dependent upon the complexity of both the aeroplane and the operation.*

## CHAPTER 3.10 FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

The operator should ensure that any person assigned as a flight operations officer/flight dispatcher is trained and maintains familiarization with all features of the operation which are pertinent to their duties, including knowledge and skills related to Human Factors.

## CHAPTER 3.11 MANUALS, LOGS AND RECORDS

***Note**. The following document is associated with this Annex but is not included in this chapter:*

Operational flight plan — see 3.4.3.3.

### 3.11.1 Operator's maintenance control manual

The operator's maintenance control manual provided in accordance with 3.8.2, which may be issued in separate parts, should be developed according to industry codes of practice or to the State of Registry's guidance material, and should at a minimum contain information about:

a) the means for complying with the procedures required by 3.8.1.1;

b) the means of recording the names and duties of the person or persons required by 3.8.1.1;

c) the maintenance programme required by 3.8.3.1;

d) the methods used for the completion and retention of the operator's continuing airworthiness records required by 3.8.5;

e) the procedures for complying with the service information reporting requirements of or Annex 8, Part II, 4.2.3 f) and 4.2.4 as applicable;

f) the procedures for implementing action resulting from mandatory continuing airworthiness information;

g) a system of analysis and continued monitoring of the performance and efficiency of the maintenance programme, in order to correct any deficiency in that programme;

h) the aircraft types and models to which the manual applies;

i) the procedures for ensuring that unserviceability affecting airworthiness are recorded and rectified; and

j) procedures for advising the Kuwait DGCA of significant in-service occurrences.

### 3.11.2 Maintenance programme

3.11.2.1 A maintenance programme for each aeroplane as required by 3.8.3 shall contain the following information:

a) maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the aeroplane;

b) when applicable, a continuing structural integrity programme

c) procedures for changing or deviating from a) and b) above as approved by Kuwait DGCA; and

d) when applicable and approved by the Kuwait DGCA, condition monitoring and reliability programme descriptions for aircraft systems, components and engines.

3.11.2.2 Maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance programme, shall be identified as such.

3.11.2.3 The maintenance programme should be based on maintenance programme information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience.

**3.11.3 Flight recorder records**

The owner of the aeroplane, or in the case where it is leased, the lessee, shall ensure, to the extent possible, in the event the aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Annex 13.

## CHAPTER 3.12 CABIN CREW

### 3.12.1 Assignment of emergency duties

The requirement for cabin crew for each type of aeroplane shall be determined by the operator, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the aeroplane, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of aeroplane.

### 3.12.2 Cabin crew at emergency evacuation stations

When cabin crew are required by a State authority, each cabin crew member assigned to emergency evacuation duties shall occupy a seat provided in accordance with 3.6.~~8~~ 10 during take-off and landing and whenever the pilot-in-command so directs.

### 3.12.3 Protection of cabin crew during flight

Each cabin crew member shall be seated with seat belt or, when provided, safety harness fastened during take-off and landing and whenever the pilot-in-command so directs.

### 3.12.4 Training

3.12.4.1 The operator shall ensure that a training programme is completed by all persons before being assigned as a cabin crew member.

3.12.4.2 The operator should establish and maintain a cabin crew training programme that is designed to ensure that persons who receive training acquire the competency to perform their assigned duties and includes or makes reference to a syllabus for the training programme in the company operations manual. The training programme should include Human Factors training.

***Note**. Guidance material on the application of Human Factors principles can be found in the Cabin Crew Safety Training Manual (ICAO Doc 10002).*

## CHAPTER 3.13 SECURITY

### 3.13.1 Security programme

Kuwait DGCA should ensure that each entity conducting general aviation operations, including corporate operator aviation operations, using aircraft with a maximum take-off mass greater than 5 700 kg, establishes, implements and maintains a written operator security programme that meets the requirements of the national civil aviation security programme of the State of Kuwait.

## ATTACHMENT 3.A COMPANY OPERATIONS MANUAL

Supplementary to 3.4.2.2

The following is the suggested content of a company operations manual. It may be issued in separate parts corresponding to specific aspects of an operation. It should include the instructions and information necessary to enable the personnel concerned to perform their duties safely and shall contain at least the following information:

a) table of contents;

b) amendment control page and list of effective pages, unless the entire document is reissued with each amendment and the document has an effective date on it;

c) duties, responsibilities and succession of management and operating personnel;

d) operator safety management system;

e) operational control system;

f) MEL procedures (where applicable);

g) normal flight operations;

h) standard operating procedures (SOPs);

i) weather limitations;

j) flight and duty time limitations;

k) emergency operations;

l) accident/incident considerations;

m) personnel qualifications and training;

n) record keeping;

o) a description of the maintenance control system;

p) security procedures (where applicable);

q) performance operating limitations;

r) use/protection of FDR/CVR records (where applicable);

s) handling of dangerous goods; and

t) use of automatic landing systems, a HUD or equivalent displays and EVS, SVS or CVS equipment as applicable.

# ATTACHMENT 3.B MINIMUM EQUIPMENT LIST (MEL)

Supplementary to 3.6.1.1

1. If deviations from the requirements of States in the certification of aircraft were not permitted, an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2. The State should indicate through approval of a minimum equipment list those systems and items of equipment that may be inoperative for certain flight conditions with the intent that no flight can be conducted with inoperative systems and equipment other than those specified.

3. A minimum equipment list, approved by the State of Registry, is therefore necessary for each aircraft, based on the master minimum equipment list established for the aircraft type by the organization responsible for the type design in conjunction with the State of Design.

4. The State of Registry should require the operator to prepare a minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.

5. The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.

6. Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without

determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.

7. The exposure to additional failures during continued operation with inoperative systems or equipment should also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements of the State of Registry unless the appropriate airworthiness authority or the flight manual provides otherwise.

8. Systems or equipment accepted as inoperative for a flight should be placarded where appropriate and all such items should be noted in the aircraft technical log to inform the flight

crew and maintenance personnel of the inoperative system or equipment.

9. For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to deactivate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.

10. The responsibilities of the pilot-in-command in accepting an aeroplane for operation with deficiencies in accordance with a minimum equipment list are specified in 2.2.3.1.

# ATTACHMENT 3.C GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

*Supplementary to Section 2, Chapter 2.4, 2.4.16 and Section 3, Chapter 3.6, 3.6.3*

## 1. INTRODUCTION

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, new and revised requirements were introduced concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, were complex.

The tables below summarize the current flight recorders carriage requirements.

**Table 3.C-1. SARPs for the recording of flight parameters**

| Date | Maximum certificated take-off mass (MCTOM) | | | |
|---|---|---|---|---|
| | Over 27000 Kg | | Over 5700 Kg | |
| | All aeroplanes new type certificate | All aeroplanes first certificate of airworthiness | All aeroplanes new type certificate | All aeroplanes first certificate of airworthiness |
| **1989 →** | | 3.6.3.1.1.2 | | 3.6.3.1.1.3 |
| **2005 →** | | 3.6.3.1.1.1 | | 3.6.3.1.1.1 |
| **2016 →** | | Table A2.3-1 (Some parameters are sampled at an increased frequency) | | |
| **2023 →** | 2.4.16.1.1.2 | 2.4.16.1.1.3 | 2.4.16.1.1.2 | 2.4.16.1.1.3 |

**Table 3.C-2. CVR/CARS installation SARPs**

| Date | Maximum certificated take-off mass (MCTOM) | | |
|---|---|---|---|
| | Over 27000 Kg | Over 5700 Kg | |
| | All aeroplanes first certificate of airworthiness | All aeroplanes first certificate of airworthiness | All turbine-engined aeroplanes operated by more than one pilot new type certificate |
| **1987 →** | 3.6.3.2.1.2 | 3.6.3.2.1.3 | |
| **2016 →** | | | 3.6.3.2.1.1 |
| **2021 →** | 3.6.3.2.2.1 | | |

**Table 3.C-3. Combination recorder installation SARPs**

| Maximum certificated take-off mass (MCTOM) |
|---|
| Over 5 700 kg |
| All aeroplanes requiring an FDR and a CVR |
| 3.6.3.3 |

**Table 3.C-4. Data link communications (DLC) recording installation clarification**

| Rows | Date individual certificate of airworthiness was first issued | Date aircraft type certificate issued or modification for DLC equipment first approved | Date of activation for use of DLC equipment | DLC recording required | SARPs reference |
|---|---|---|---|---|---|
| **1** | On or after 1 January 2016 | On or after 1 January 2016 | On or after 1 January 2016 | Yes | 3.6.3.1.1 |
| **2** | On or after 1 January 2016 | Before 1 January 2016 | On or after 1 January 2016 | Yes | 3.6.3.1.1 |

| | | | | | |
|---|---|---|---|---|---|
| **3** | Before 1 January 2016 | On or after 1 January 2016 | On or after 1 January 2016 | Yes | 3.6.3.1.2 |
| **4** | Before 1 January 2016 | Before 1 January 2016 | Before 1 January 2016 | No | 3.6.3.1.2 |
| **5** | Before 1 January 2016 | Before 1 January 2016 | On or after 1 January 2016 | Not required but recommended | 3.6.3.1.2<br>2.6.3.1.3 |

## 2. TABLE HEADINGS

2.1 Date individual certificate of airworthiness was first issued is self-explanatory.

2.2 Date aircraft type certificate issued or modification for DLC equipment first approved is the date that allows the installation of DLC equipment on the aircraft and refers to the airworthiness approval of the installation of aircraft components such as the structural and wiring provisions with which the DLC equipment needs to be compliant. These airworthiness approvals are usually in a form of a type certificate, a supplemental type certificate or an amended type certificate.

2.2.1 It is not uncommon for original customers of an aircraft that have airworthiness approvals related to DLC capability, to choose not to install the DLC equipment or choose not to have it activated even if the aircraft is prepared for it.

2.3 Date of activation for use of DLC equipment refers to the date that a DLC application referred to in 5.1.2 of Appendix

2.3 was first activated for use.

2.3.1 Datalink communication (DLC) equipment as used in these provisions, refer to the physical unit(s) (e.g. box(es)) that was approved to a minimum performance standard issued by a certification authority (e.g. TSO or ETSO).

2.3.2 The activation of DLC functions refer to approved software activation of DLC functions or software updates.

2.4 DLC recording required refers to the requirement to record DLC messages in accordance with provisions 2.4.16.3.1.1, 2.4.16.3.1.2 and 2.4.16.3.1.3.

## 3. GENERAL

3.1 It is the date on which the CVR capabilities of the aircraft were approved that determines the DLC recording requirement. The date in which the DLC equipment was approved to a minimum performance standard is not relevant for CVR recording requirement purposes.

3.2 For the DLC equipment to be compliant with an airworthiness approval, it needs to be able to use, without modification, the installed aircraft components that are necessary to provide the DLC function such as the:

a) datalink router (e.g. hosted in the communications management unit);

b) radios (e.g. VHF, HF datalink, SATCOM) and related antennas.

3.3 Approved software updates to installed equipment or software activation of functions normally do not alter the DLC equipment compliance with the rest of the aircraft systems.

## 4. EXAMPLES

4.1 For rows 1 and 2:

— The recording requirement is driven by Standard 2.4.16.3.1.1 which is based on when the individual certificate of airworthiness was first issued. Any subsequent airworthiness modifications related to DLC capability do not exempt the aircraft from the requirement to record DLC messages.

4.2 For rows 3 to 5 — General:

— The recording requirement is driven by Standard 2.4.16.3.1.2 and is based on whether or not the aircraft has an airworthiness approval for DLC capabilities and the date of its issue.

— Since there was no requirement to record DLC messages prior to 1 January 2016, airworthiness approvals related to DLC capability issued before that date did not necessarily include this function.

4.3 For row 3:

— The recording requirement applies regardless of when the certificate of airworthiness was issued, because an airworthiness approval related to DLC capability was issued on or after 1 January 2016. The date of installation of the equipment would typically be after the airworthiness approval.

4.4 For row 4:

— The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The

date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

4.5 For row 5:

— The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

— Notwithstanding the above, if the installation of the DLC equipment is on or after 1 January 2016, DLC messages should be recorded in accordance with Recommendation 2.4.16.3.1.3.

# ATTACHMENT 3.D AUTHORIZATIONS

An authorization entitles an operator, owner or pilot-in-command to undertake the authorized operations. Authorizations can take the form of specific approvals, approvals or acceptances.

## 1. SPECIFIC APPROVAL ACTIONS

1.1 The term "specific approval" indicates a formal action on the part of the State which results in an addition to the specific approval template.

1.2 The following provisions make explicit reference to the need for a specific approval:

a) operational credits for operations with advanced aircraft, when used for low visibility operations [2.2.2.~~2~~3.1.1];

b) low visibility operations [2.2.2.~~2~~3.5, 2.2.2.~~2~~3.6];

c) electronic flight bags [2.4.17.2.2];

d) AR navigation specifications for PBN operations [2.5.2.5]; and

e) reduced vertical separation minima [2.5.2.7 b)].

1.3 The specific approval template is provided in Appendix 2.4

## 2. APPROVAL ACTIONS

The term "approval" indicates a more formal action on the part of the State with respect to a certification matter than does the term "acceptance". Some States require the Director of the Civil Aviation Authority (CAA) or a designated lower-level CAA official to issue a formal written instrument for every "approval" action taken. Other States allow a variety of documents to be issued as evidence of an approval. The approval document issued and the matter addressed by the approval will depend on the delegated authority of the official. In such States, authority to sign routine approvals is delegated to technical inspectors. More complex or significant approvals are normally issued by higher-level officials.

## 3. PROVISIONS THAT REQUIRE AN APPROVAL

The following provisions require or encourage approval by specified States. The approval of the State of Registry is required in all of the certification actions listed below that are not preceded by an asterisk. Certification actions listed below that are preceded by one or more asterisks require approval by the State of Registry (single asterisk or "*"), or by the State of Design (double asterisk or "**"). However, the State of Registry should take the necessary steps to ensure that operators for which it is responsible comply with any applicable approvals issued by the State of Design, in addition to its own requirements.

***Note**. Items that require a specific approval are not included here. Refer to 1.2 of this attachment for a list of*

*these provisions.*

a) *Configuration deviation list (CDL) (Definitions);

b) *Master minimum equipment list (MMEL) (Definitions);

c) Aircraft-specific minimum equipment list (MEL) (3.6.1.1);

d) Performance-based navigation operations (other than RNP-AR) (2.5.2.3));

e) MNPS operations (2.5.2.6 b));

f) Procedures for electronic navigation data management (3.7.3); and

g) **Mandatory maintenance tasks and intervals (3.11.2.2).

**END**