



GOVERNMENT OF INDIA
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPP SAFDURJUNG AIRPORT, NEW DELHI

CIVIL AVIATION REQUIREMENTS
SECTION 8 – AIRCRAFT
OPERATIONS SERIES 'O' PART III
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Subject: Operation of General Aviation Aeroplanes

1. INTRODUCTION

1.1 This CAR lays down provisions for an aircraft operation other than commercial air transport operation or an aerial work operation for aeroplanes registered in India and engaged in general aviation and lays down the minimum operational, equipment and instrument requirements.

1.2 This CAR has been issued under the provision of Rule 29 and Rule 133A of the Aircraft Rules 1937, for adoption of the minimum operational, equipment and instrument requirement of ICAO as per Annex 6 Part II.

1.3 This CAR is issued in supersession of CAR Section 2 Series 'O' Part III, Issue II, dated 15th July 1999.

2. APPLICABILITY

2.1 The provisions of CAR are applicable to Indian registered aeroplanes engaged in general aviation which include aeroplanes to general Aviation such as certified in private or passenger category for *state governments*, corporate business houses, individual owner(s) or when such aeroplanes are not engaged in commercial air transport operations and aerial work.

2.2 The *Section 2* of this CAR is applicable to all the general aviation operations of aeroplanes and *Section 3* adds additional requirements when general aviation operations are conducted with the following:

- a) aeroplanes with a maximum certificated take-off mass exceeding 5700 kg; or
- b) aeroplanes equipped with one or more turbine engines; or
- c) aeroplanes with a seating configuration of more than 9 passengers seats.

The above applicability does not preclude a general aviation operator from satisfying the requirements of section "3" where it may be to the operator's advantage or in the interest of safety.

Rev.2, 1st June 2012

SECTION - 1

DEFINITIONS AND ABBREVIATIONS

Acts of unlawful interference. These are acts or attempted acts such as to jeopardize the safety of civil aviation and air transport, i.e.:

- unlawful seizure of aircraft in flight,
- unlawful seizure of aircraft on the ground,
- hostage-taking on board an aircraft or on aerodromes,
- forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility,
- introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes,
- communication of false information as to jeopardize the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.

Aerial work. An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, **and such.**

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome Operating Minima. The limits of usability of an aerodrome for:

- a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of operation;
- c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and
- d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

Aeroplane. A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Airworthy. The status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.

Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing. Alternate aerodromes include the following:

- *Take-off alternate.* An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.
- *En-route alternate.* An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en-route.
- *Destination alternate.* An alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note: The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.

- **Altimetry system error (ASE).** The difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude *Non-precision approach and landing operations*. An instrument approach and landing which utilizes lateral guidance but does not utilize vertical guidance.
- *Approach and landing operations with vertical guidance.* An instrument approach and landing which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.
- *Precision approach and landing operations.* An instrument approach and landing using precision lateral and vertical guidance with minima as determined by the category of operation.

Approach and landing operations using instrument approach procedures. Instrument approach and landing operations are classified as follows:

- Note.-Lateral and vertical guidance refers to the guidance provided either by:*
- a) a ground-based navigation aid; or
 - b) computer generated navigation data.

Categories of precision approach and landing operations:

- Category I (CAT I) operation. A precision instrument approach and landing with:
 - a) a decision height not lower than 60 m (200 ft); and
 - b) either a visibility not less than 800 m or a runway visual range not less than 550 m.
- Category II (CAT II) operation. A precision instrument approach and landing with:
 - a) a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft); and
 - b) a runway visual range not less than 300 m.
- Category IIIA (CAT IIIA) operation. A precision instrument approach and landing with:
 - a) a decision height lower than 30 m (100 ft) or no decision height; and
 - b) a runway visual range not less than 175 m.
- Category IIIB (CAT IIIB) operation. A precision instrument approach and landing with:
 - a) a decision height lower than 15 m (50 ft) or no decision height; and
 - b) a runway visual range less than 200 m but not less than 50 m.
- Category IIIC (CAT IIIC) operation. A precision instrument approach and landing with no decision height and no runway visual range limitations.

Note.— Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach and landing 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 IIIA but with an R VR in the range of CAT IIIB would be considered a CAT IIIB operation or an operation with a DH in the range of CAT II but with an R VR in the range of CAT I would be considered a CAT II operation).

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or spaced-based navigation aids or within the limits of the capability of self contained aids, or a combination of these.

Note. — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

Cabin crew member. A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in command of the aircraft, but who shall not act as a flight crew member.

Commercial air transport operation. An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

Continuing airworthiness. The set of processes by which all aircraft comply with the applicable airworthiness requirements and remain in a condition for safe operation throughout their operating life.

Corporate aviation operation. The non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot(s) employed to fly the aircraft.

Combined vision system (CVS). A system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Note. — Dangerous goods are classified in accordance with “Carriage of Dangerous Goods” Rules, 2003.

Decision altitude (DA) or decision height (DH). A specified altitude or height in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1. — Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

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 Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

Note 3. — For convenience where both expressions are used they may be written in the form “decision altitude/height” and abbreviated “DA/H”.

Emergency locator transmitter (ELT). A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT

Rev.3, 13th Nov 2014

CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III

SECTION 8
6TH JAN 2011

may be any of the following

- *Automatic fixed ELT (ELT(AF)).* An automatically activated ELT which is permanently attached to an aircraft.
- *Automatic portable ELT (ELT(AP)).* An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.
- *Automatic deployable ELT (ELT(AD)).* An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.
- *Survival ELT (ELT(S)).* An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

Engine. A unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable).

Extended flight over water. A flight operated over water at a distance of more than 93 km (50 NM), or 30 minutes at normal cruising speed, whichever is the lesser, away from land suitable for making an emergency landing.

Electronic flight bag (EFB). An electronic information system, comprised of equipment and applications, for flight crew which allows for storing, updating, displaying and processing of EFB functions to support flight operations or duties.

Enhanced vision system (EVS). A system to display electronic real-time images of the external scene achieved through the use of image sensors.

Note.— EVS does not include night vision imaging systems (NVIS).

Flight crew member. A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight manual. A manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

Flight recorder. Any type of recorder installed in the aircraft for the purpose of complimenting accident/incident investigation.

Flight simulation training device. Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated

- *A flight procedures trainer, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;*
- *A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.*

Flight time - Aeroplanes. The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Note - Flight time as here defined is synonymous with the term "block to block" time or "chock to chock" time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.

General aviation operation. An aircraft operation other than a commercial air transport operation or an aerial work operation.

Head-up display (HUD). A display system that presents flight information into the pilot's forward external field of view.

Instrument meteorological conditions (IMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note:-specified minima for visual Meteorological conditions are contained in CAR, Section -4, Series 'E' part -I

Isolated aerodrome. A destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

Large aeroplane. An aeroplane of a maximum certificated take-off mass of over 5700 kg.

Maintenance. The performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

Maintenance programme. A document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

Maintenance release. A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, either in accordance with the approved data and the procedures described in the maintenance organization's procedures manual or under an equivalent system.

Meteorological information. Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

Minimum descent altitude (MDA) or minimum descent height (MDH). A specified altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

Note 1.— Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 7 ft (2 m) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

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 the required visual reference is the runway environment.

Note 3:- For convenience when both expressions are used they may be written in the form "minimum descent altitude/height" and abbreviated "MDA/H".

Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

- **Required navigation performance (RNP specification).** A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.
- **Area navigation (RNAV specification).** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note 1. — The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II contains detailed guidance on navigation specifications and CAR Ser 2 Sec O pt XII. Performance Based Navigation (PBN) – Aircraft Airworthiness, Operational and Flight Crew Training Requirements for Required Navigation Performance (RNP)/ Area Navigation (RNAV).

Note 2. — The term RNP as previously defined as “a statement of the navigation performance, necessary for operation within a defined airspace”, has been removed from this CAR as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this CAR is now solely used in the context of navigation

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES ‘O’ PART III**

**SECTION 8
6TH JAN 2011**

specifications that require performance monitoring and alerting, e.g. RNP4 refers to the aircraft and operating requirements, including a 4NM lateral performance with on board performance monitoring and alerting that are detailed in PBN Manual (Doc 9613).

Night. The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by DGCA.

Note. — Civil twilight ends in the evening when the centre of the sun’s disc is 6 degrees below the horizon and begins in the morning when the centre of the sun’s disc is 6 degrees below the horizon.

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH). The lowest altitude or lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable used in establishing compliance with appropriate obstacle clearance criteria.

Note 1— Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 7 feet (2 meter) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

Note 2— For convenience when both expressions are used they may be written in the form “obstacle clearance altitude/height” and abbreviated “OCA/H”.

Operating base. The location from which operational control is exercised.

Note. — An operating base is normally the location where personnel involved in the operation of the aeroplane work and the records associated with the operation are located. An operating base has a degree of permanency beyond that of a regular point of call.

Operational control. The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

Operational flight plan. The operator’s plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

Operations manual. A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

Note. — In the context of this CAR, the operator is not engaged in the transport of passengers, cargo or mail for remuneration or hire

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Pilot-in-command. The pilot designated by the operator or the owner as being in command and charged with the safe conduct of a flight.

Psychoactive substances. Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psycho stimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

Point of no return. The last possible geographic point at which an aeroplane can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

RCP type. A label (e.g. RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity.

Repair. The restoration of an aeronautical product to an airworthy condition to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type, after it has been damaged or subjected to wear. **Required communication performance (RCP).** A statement of the performance requirements for operational communication in support of specific ATM functions.

Required navigation performance (RNP). A statement of the navigation performance necessary for operation within a defined airspace.

Note. — Navigation performance and requirements are defined for a particular RNP type and/or application.

Runway visual range (RVR). The range over which the pilot of an aircraft on the center line of runway can see the runway surface markings or the lights delineating the runway or identifying its center line.

Safety management system. A systematic approach to managing safety,

including the necessary organizational structures, accountabilities, policies and procedures.

State of Registry. The State on whose register the aircraft is entered.

State of the Aerodrome. The State in whose territory the aerodrome is located.

Synthetic vision system (SVS). A system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

Target level of safety (TLS). A generic term representing the level of risk which is considered acceptable in particular circumstances.

Total vertical error (TVE). The vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

Visual meteorological conditions (VMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

Note. — The specified minima are contained in CAR, Section 4, Series 'E Part I.

Section-2

The requirements detailed in this section are applicable to all general aviation operation of aeroplanes.

Note. — The above applicability does not preclude a general aviation operator from satisfying the requirements of Section "3" where it may be to the operator's advantage or in the interest of safety.

2.1 GENERAL

2.1.1 Compliance with laws, regulations and procedures

The pilot-in-command shall 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, Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS, Volume II.

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 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

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

2.1.1.4 If an emergency situation which endangers the safety of the aeroplane or persons

necessitates the taking of action which involves a violation of regulations or procedures, the pilot-in-command / operator shall notify the nearest Air Safety office of DGCA without delay in accordance with the procedure as prescribed in CAR, Section 5, Series 'C', Part-I. In the event such emergency situation occurs outside India, the pilot-in-command shall notify the appropriate local authority without delay and if required by the State in which the incident occurs, the pilot-in-command shall also submit a report of the occurrence on any such violation to the appropriate authority of such State. The pilot-in-command shall submit a copy of the occurrence to the DGCA marked attention of Director of Air Safety (Hqrs) with a copy endorsed to the Regional Air Safety Office where the aeroplane is normally based. Such reports shall be submitted within 48hours.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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

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 Annex 1.

2.1.2 Dangerous goods

Note.— Provisions for carriage of dangerous goods are contained in the Aircraft (Carriage of Dangerous Goods) Rules, 2003.

2.1.3 Use of psychoactive substances

Note. — Provisions concerning the use of psychoactive substances are contained in Rule 24 of the Aircraft Rules, 1937.

2.2 FLIGHT OPERATION

2.2.1 Operating facilities

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, are adequate for the type of operation under which the flight is to be conducted.

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

2.2.2 Operational management

2.2.2.1 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 telephone if radio communications are required or a person qualified to use R.T. is on board; 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

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

2.2.2.2 Aerodrome operating minima

2.2.2.2.1 The pilot-in-command shall establish aerodrome operating minima in accordance with

criteria specified by the State of Registry, for each aerodrome to be used in operations. 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.

2.2.2.2.1.1 The State of Registry may approve operational credit(s) for operations with aeroplanes

equipped with HUD or equivalent displays, EVS, SVS or CVS. Such approvals 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), a minima 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 for aircraft equipped with a HUD or equivalent displays,

EVS, SVS and CVS is contained in Attachment 2.B and in the 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 Manual of All-Weather Operations (Doc 9365).

2.2.2.3 Passengers

2.2.2.3.1 The pilot-in-command 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 use of oxygen is anticipated; and
- e) other emergency equipment provided for individual use, including passenger emergency briefing cards

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

2.2.2.3.2 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.

2.2.2.3.3 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 In all such cases where cabin crew is carried 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 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 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 para 2.6;
- 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.

2.2.3.2 The pilot-in-command shall 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.

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

**SECTION 8
6TH JAN 2011**

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

Note.— The requirements for flight plans are contained in ICAO Annex 2— Rules of the Air and Procedures for Air Navigation Services — Air Traffic Management PANS-ATM, Doc 4444).

2.2.3.4 Metrological conditions

2.2.3.4.1 A flight to be conducted in accordance with the visual flight rules 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 the visual flight rules will, at the appropriate time, be such as to render compliance with these rules .

2.2.3.4.2 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.

2.2.3.4.3 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 Flight Planning and Fuel Management Manual (Doc 9976).

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

Note.— Guidance material is given in the Manual of Aircraft Ground

2.2.3.5 Alternate aerodromes

2.2.3.5.1 Destination alternate aerodromes

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

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

Rev.3, 13th Nov 2014

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

**SECTION 8
6TH JAN 2011**

- 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 estimate time of use:
 - i) a cloud base of at least 300 m (1000 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

2.2.3.6 Fuel and oil requirements

2.2.3.6.1 A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aeroplane carries sufficient fuel and oil to ensure that it can safely complete the flight. 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 2.2.3.5.1, flight to the aerodrome of intended landing, and after that, 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 from the aerodrome of intended landing to an alternate aerodrome, and

- after that, for at least 45 minutes at normal cruising altitude; or
- c) when the flight is conducted in accordance with the visual flight rules by day, flight to the aerodrome of intended landing, and after that, for at least 30 minutes at normal cruising altitude; or
- d) when the flight is conducted in accordance with the visual flight rules by night, flight to the aerodrome of intended landing and thereafter for at least 45 minutes at normal cruising altitude.

Note 1.— Nothing in 2.2.3.6 precludes amendment of a flight plan in flight in order to replan the flight to another aerodrome, provided that the requirements of 2.2.3.6 can be complied with from the point where the flight is replanned.

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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

2.2.3.6.2 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 Refuelling with passengers on board

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

2.2.3.7.2 When refuelling with passengers embarking, on board or disembarking, two-way communications should be maintained by the aeroplane's intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by 2.2.3.7.1

Note. — Provisions concerning aircraft refuelling and safe refuelling practices are contained in Rule 25A of the Aircraft Rules, 1937.

2.2.3.8 Oxygen supply

The pilot-in-command during the pre-flight 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 Appendix-1.

Note 2. — Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text of Appendix-1 are as follows:

Absolute pressure	Meters	Feet
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700 hPa	3000	10000
620 hPa	4000	13000
376 hPa	7600	25000

2.2.4 In-flight procedures

2.2.4.1 Aerodrome operating minima

2.2.4.1.1 A flight shall not be continued towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with 2.2.2.2.

Rev.3, 13th Nov 2014

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

SECTION 8
6TH JAN 2011

2.2.4.1.2 An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (1000ft) above the aerodrome in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.

2.2.4.1.3 If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1000 ft) above the aerodrome in case of non precision approach, 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 shall not continue its approach-to-land beyond a point at which the limits of the aerodrome operating minima would be infringed

Note.— Controlling RVR means the reported values of one or more RVR reporting locations (touchdown, mid-point 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 DGCA.

2.2.4.2 Weather reporting by pilots

When weather 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 ICAO Annex 3, the PANS-ATM (Doc 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).

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 Flight crew members at duty stations

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

2.2.4.4.2 *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 aeroplane or for physiological needs.

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

2.2.4.4.4 *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 seatbelt must remain fastened.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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

2.2.4.5 Use of oxygen

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 prescribed in 2.2.3.8.

2.2.4.6 Safeguarding of cabin crew and passengers in pressurized 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

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

2.2.4.7 In-flight fuel management

2.2.4.7.1 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 where a safe landing can be made with the planned final reserve fuel remaining.

2.2.4.7.2 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, the pilot calculates that any change to the existing clearance to that aerodrome, or other air traffic delays, 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, 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.

2.2.4.7.3 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 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 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, b) 3.

2.2.4.8 Instrument approach procedures

2.2.4.8.1 One or more instrument approach procedures designed in accordance with the classification of instrument approach and landing operations shall be approved and promulgated by the

Rev.3, 13th Nov 2014

CIVIL AVIATION REQUIREMENTS SERIES ‘O’ PART III

**SECTION 8
6TH JAN 2011**

2.2.4.8.2 Aeroplanes operated in accordance with the instrument flight rules shall comply with the instrument approach procedures approved by the DGCA or State in which the aerodrome is located.

Note 1. — Definitions for the classification of instrument approach and landing operations are at section 1

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 Chapter 2.1, 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 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 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 DGCA and 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.

Note. — A definition of the term “serious injury” is contained in CAR, Section 5, series ‘C’, Part I.

2.2.6 Cabin baggage (take-off and landing)

During the pre-flight inspection the pilot-in-command shall confirm that all baggage carried onto an aeroplane is taken into the passenger cabin and is securely stowed.

2.3 AEROPLANE PERFORMANCE OPERATING LIMITATIONS

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES ‘O’ PART III

**SECTION 8
6TH JAN 2011**

- a) in compliance with the terms of its airworthiness certificate or equivalent approved document;
- b) within the operating limitations prescribed by the DGCA; and
 - a) if applicable, within the mass limitations imposed by compliance 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 DGCA/competent authority of the State in which the aerodrome is situated.

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

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

2.4 AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

Note. — Specifications for the provision of aeroplane communication and navigation equipment are contained in para 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 aeroplanes according to the aeroplane used and to the circumstances under which the flight is to be conducted. The prescribed instruments and equipment, including their installation, shall be acceptable to the DGCA.

2.4.2 Aeroplanes on all flights

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

2.4.2.2 Aeroplanes on all flights shall be equipped with:

- 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 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 not readily accessible to the pilot or co-pilot;

Note. – Refer to 2.4.2.3 for fire extinguishing agents.

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

**SECTION 8
6TH JAN 2011**

- 1) a seat or berth for each person over an age of 2 years
- 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 aeroplane by the DGCA or manufacturer, required for the application of para 2.3;
 - 2) 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;
 - 3) procedures, as prescribed in CAR, Section 4, Series 'E' Part I, for pilots-in- command of intercepted aircraft;
 - 4) visual signals for use by intercepting and intercepted aircraft, as contained in CAR, Section 4, Series 'E' Part I; and
 - 5) the journey log book for the aeroplane;
- e) where the 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 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 aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2016 shall:

- a) meet the applicable minimum performance requirements; and

b) not be of a type listed in Annex A, Group II of the *Montreal Protocol on Substances That Deplete the Ozone Layer*, 8th Edition, 2009.

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

2.4.2.5 Aeroplanes on all flights should 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

Rev.2, 1st June 2012

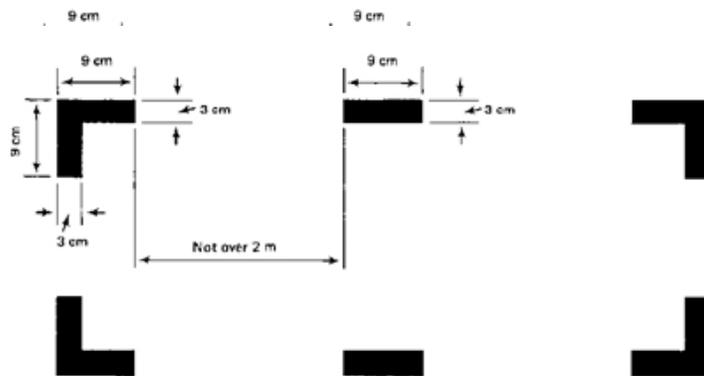
**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

4.2.6.1 If areas of the fuselage suitable for break-in by rescue crews in emergency are marked on an aeroplane such areas shall be marked as shown below (see figure following). 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 para does not require any aeroplane to have break-in areas.



MARKING OF BREAK-IN POINTS

2.4.3 Aeroplanes operated as VFR flights

2.4.3.1 Aeroplanes when operated as VFR flights shall be equipped with:

- a) a means of measuring and displaying:
 - 1) magnetic heading;
 - 2) the time in hours, minutes and seconds;
 - 3) Barometric altitude;
 - 4) indicated airspeed; and

b) such additional equipment as may be prescribed by the manufacturer/DGCA.

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

2.4.4 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.

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

- 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

2.4.4.2.1 Single-engine landplanes

All single-engine 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 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 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 lifesaving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken; and

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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

2.4.5 Aeroplanes on flights over designated land areas

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

2.4.6 Aeroplanes on high altitude flights

2.4.6.1 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 2.2.3.8.

2.4.6.2 Aeroplanes for which the individual certificate of airworthiness was 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 Aeroplanes operated in accordance with the instrument flight rules

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:

- a) a means of measuring and displaying:
 - 1) magnetic heading (standby compass);
 - 2) the time in hours, minutes and seconds;
 - 3) Barometric altitude;
 - 4) indicated airspeed, with a means of preventing malfunctioning due to either condensation or icing;
 - 5) turn and slip;

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

- 6) aircraft attitude; and
- 7) stabilized aircraft heading;

Note. — The requirements of 5), 6) and 7) 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.

- 8) whether the supply of power to the gyroscopic instruments is adequate;
- 9) the outside air temperature;
- 10) rate-of-climb and descent; and

b) such additional instruments or equipment as may be prescribed by the DGCA, or as required for the specific type of Operation.

2.4.8 Aeroplanes when operated at night

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

- a) the equipment specified in 2.4.7; and
- b) the lights required by CAR, Section 4, Series 'E' Part I, for aircraft in flight or operating on the movement area of an aerodrome;

Note.— Specifications for lights meeting the requirements of ICAO Annex 2 for navigation lights are contained in Appendix 1. The general characteristics of lights are specified in ICAO Annex 8. Detailed specifications for lights meeting the requirements of ICAO Annex 2 for aircraft in flight or operating on the movement area of an aerodrome are contained in the Airworthiness Manual (Doc 9760).

- c) a landing light;
- d) illumination for all flight instruments and equipment that are essential for the safe operation of the aeroplane that are used by the flight crew;
- e) lights in all passenger compartments; and
- f) an independent portable light for each crew member station.

2.4.9 Aeroplanes complying with the noise certification Standards in Annex 16, Volume I

An aeroplane shall carry a document attesting noise certification as per CAR, Section 2, Series 'X' Part VII.

2.4.10 Mach number indicator

Aeroplanes with speed limitations expressed in terms of Mach number

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

shall be equipped with a means of displaying Mach number.

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

Aeroplanes so defined in CAR, Section 2, Series 'I', Part 'VII' shall be fitted with Ground Proximity Warning System (GPWS).

2.4.12 Emergency locator transmitter (ELT)

2.4.12.1 All aeroplanes shall 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 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 on frequencies 121.5 MHz and 406 MHz.

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.

2.4.13 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 CAR, Section 2,

2.4.13.2 Aeroplanes operating as VFR flights shall be equipped with a pressure altitude reporting transponder which operates in accordance with the relevant provision of CAR, Section 2, Series 'R', Part 'IV'.

Note. — This provision is intended to support the effectiveness of ACAS as well as to improve the effectiveness of air traffic services.

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

SECTION 8
6TH JAN 2011

2.4.14 Microphones

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.

Note: For high Performance aircraft FL 100/ 10000 ft. is recommended instead of Transition Altitude/ Level.

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

2.4.15.1 Where aeroplanes are equipped with 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 to for the safe operation of an aeroplane shall be established by the State of Registry.

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

2.4.15.2 In approving the operational use of a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall ensure that:

- a) the equipment meets the appropriate airworthiness certification requirements;
- b) the operator has carried out a safety risk assessment of the operations supported by the HUD or equivalent displays, EVS, SVS or CVS;
- c) the operator has established and documented the procedures for the use of, and training requirements for, a HUD or equivalent displays, EVS, SVS or CVS.

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

Note 2.— Guidance on operational approvals is contained in Attachment 2.B.

2.4.16 Flight recorders

Note 4.— For aeroplanes for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.

Note 5.— For aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Note 6.— Specifications applicable to lightweight flight recorders may be found in EUROCAE ED 155, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Rev.3, 13th Nov 2014

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

**SECTION 8
6TH JAN 2011**

2.4.16.1 Operation

2.4.16.1.1 Recommendation.— *All turbine-engined aeroplanes with a seating configuration of*

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

a) a Type II FDR; or

b) a Class C AIR or AIRS capable of recording flight path and speed parameters displayed to the pilot(s); or

c) an ADRS capable of recording the essential parameters defined in Table 2.3-3 of Appendix 2.3.

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

2.4.16.1.2 The use of analogue FDRs using frequency modulation (FM) shall be discontinued

2.4.16.1.3 The use of photographic film FDRs shall be discontinued.

2.4.16.1.4 Recommendation.— *The use of magnetic tape FDRs should be discontinued*

2.4.16.1.5 The use of magnetic tape FDRs shall be discontinued by 1st January 2016

2.4.16.2 Cockpit voice recorders and cockpit audio recording systems

2.4.16.2.1 Operation

2.4.16.2.1.1 **Recommendation.**— *All turbine-engined aeroplanes with a seating configuration of more than five passenger seats and of a maximum certificated take-off mass of 5 700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 and required to be operated by more than one pilot should be equipped with either a CVR or a CARS.*

2.4.16.2.1.2 **Recommendation.**— *The use of magnetic tape and wire CVRs should be discontinued .*

2.4.16.3 Data Link Recorder

2.4.16.4 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.

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

2.4.17 Electronic flight bags (EFBs)

Note. — *Guidance on EFB equipment, functions and establishing criteria for the operational use is contained in the Manual on Electronic Flight Bags (Doc xxxx).*

2.4.17.1 EFB equipment

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

2.4.17.2 EFB functions

2.4.17.2.1 Where EFBs are used on board an 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 Safety Management Manual (SMM) (Doc 9859).

2.4.17.2.2 The State of Registry shall establish criteria for the operational use of EFB functions to be used for the safe operations of aeroplanes.

2.4.17.3 EFB operational criteria

2.4.17.3.1 In establishing operational criteria for the use of EFBs, the State of Registry 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).

Rev.3, 13th November 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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

2.5 AEROPLANE COMMUNICATION AND NAVIGATION EQUIPMENT

2.5.1 Communication equipment

2.5.1.1 An 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/DGCA.

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 aeroplane to be operated in accordance with the visual flight rules, but as a controlled flight, shall, unless exempted by the DGCA, 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/DGCA.

2.5.1.4 An aeroplane to be operated on a flight to which the provisions of 2.4.4.3.1 or 2.4.5 apply shall, unless exempted by the DGCA, 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/ DGCA.

2.5.1.5 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 flights in defined portions of airspace or on routes where an RCP type has been prescribed, an 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 type(s); and

b) be authorized by the DGCA for such operations.

Rev.3, 13th November 2014

CIVIL AVIATION REQUIREMENTS SERIES 'O' PART III

**SECTION 8
6TH JAN 2011**

Note.— Information on RCP and associated procedures, and guidance concerning the approval process, are contained in the Manual on Required Communication Performance (RCP)(DOC 9869). This document also contains references to other documents produced by States and international bodies concerning communication systems and RCP.

2.5.2 Navigation equipment

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

a) in accordance with the flight plan; and

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

2.5.2.2

For operations where a navigation specification for PBN has been prescribed, an 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) be authorized by the DGCA for such operations

Note.— Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the CAR, Section 2, Series 'O', Part 'XII'.

2.5.2.3 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 DGCA for MNPS operations concerned.

Note.— The prescribed minimum navigation performance specifications and the procedures governing their application are given in the CAR, Section 2, Series 'O', Part 'IX'

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

2.5.2.3 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 DGCA for MNPS operations concerned.

Note.— The prescribed minimum navigation performance specifications and the procedures governing their application are given in the CAR, Section 2, Series 'O', Part 'IX'.

2.5.2.4 For flights in defined portions of airspace where, based on regional air navigation agreement, a reduced vertical separation minimum (RVSM) of 300 m (1000 ft) is applied between FL 290 and FL 410 inclusive, an aeroplane:

- a) 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) shall be authorized by the DGCA for operation in the airspace concerned; and
- c) shall demonstrate a vertical navigation performance in accordance with Appendix 4.

2.5.2.5 Prior to applying for the RVSM approval required in accordance with 2.5.2.4 b), the owner/operator shall be satisfied that:

- a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Appendix 5;
- 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 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.

2.5.2.6 In respect of those aeroplanes mentioned in 2.5.2.4, adequate provisions exist in CAR, Section-2, Series "O", Part 'XI' for:

- a) receiving the reports of height-keeping performance issued by the monitoring agencies; and
- b) taking immediate corrective action for individual aircraft, or

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operation in airspace where RVSM is applied.

2.5.2.7 An operator that has been issued an RVSM approval shall ensure that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If an 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 Appendix 5, may be used to satisfy the requirement.

2.5.2.8 DGCA is responsible for airspace where RVSM has been implemented, or to issue RVSM approvals to operators within India. Where an aircraft is operating without the approval in Indian airspace, and where an operator for whom DGCA has regulatory oversight responsibility is found to be operating without the required approval in the airspace of another State, DGCA may take appropriate action in

respect of aircraft and operators found to be operating in RVSM airspace without a valid RVSM approval.

2.5.2.9 The aeroplane shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with 2.5.2.1 and where applicable 2.5.2.2, 2.5.2.3 and 2.5.2.4.

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 (1000 ft) VSM is applied above FL 290 is contained in the Manual on Implementation of a 300 m (1000 ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive (Doc 9574)(CAR Sec2, Ser O, Pt XI).

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

2.6 AEROPLANE MAINTENANCE

Note 1.— For the purpose of this para “aeroplane” includes: powerplants, propellers, components, accessories, instruments, equipment and apparatus including emergency equipment

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES ‘O’ PART III**

**SECTION 8
6TH JAN 2011**

Note 2.— Guidance on continuing airworthiness requirements is contained in the Airworthiness Manual (Doc 9760).

2.6.1 Owner’s maintenance responsibilities

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

- a) the aeroplane is maintained in an airworthy condition;
- b) the operational and emergency equipment necessary for an intended flight is serviceable; and
- c) the Certificate of Airworthiness of the aeroplane remains valid.

2.6.1.2 The owner or the lessee shall not operate the aeroplane unless it is maintained and released to service under a system acceptable to the DGCA.

2.6.1.3 When the maintenance release is not issued by an approved maintenance organization, the person signing the maintenance release shall be licensed in accordance with DGCA licensing requirements.

2.6.1.4 The owner or the lessee shall ensure that the maintenance of the aeroplane is performed in accordance with a maintenance programme acceptable to the DGCA.

2.6.2 Maintenance records

2.6.2.1 The owner of an 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 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 aeroplane or its components subject to a mandatory overhaul life;
- e) the current status of the aeroplane's compliance with the maintenance programme; and

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

- f) the detailed maintenance records to show that all requirements f or 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. — Maintenance records or related documents, other than a valid certificate of airworthiness, need not be carried in the aeroplane during international flights.

2.6.3 Modifications and repairs

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

2.6.4 Maintenance release

2.6.4.1 A maintenance release shall be completed and signed, as prescribed by the DGCA, to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures acceptable to the DGCA.

2.6.4.2 A maintenance release shall contain a certification including:

- a) basic details of the maintenance performed;
- b) the date such maintenance was completed;
- c) when applicable, the identity of the approved maintenance organization; and
- d) The identity of the authorized person or persons signing the release.

2.7 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

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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 DGCA, or if issued by another Contracting State, rendered valid by the 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 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 to Part III, Section 3, Chapter 3 “ACAS II Training Guidelines for Pilots”.

Note 2.— Appropriate training, to the satisfaction of the 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 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) 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.

2.8 MANUALS, LOGS AND RECORDS

2.8.1 Flight manual

Note. — The aeroplane flight manual contains the information specified in ICAO Annex 8.

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

2.8.2 Journey log book

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES ‘O’ PART III

**SECTION 8
6TH JAN 2011**

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

2.8.2.2 The aeroplane journey log should contain the following items:

- a) 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 centers, lists containing information on the emergency and survival equipment carried on board the aeroplane engaged in 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.

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 “Bureau of Civil Aviation Security”(BCAS).

Note.— In the context of this para, the word “security” is used in the sense of prevention of acts of unlawful interference against civil aviation.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES ‘O’ PART III**

**SECTION 8
6TH JAN 2011**

Section- 3 **LARGE AND TURBOJET AEROPLANES**

3.1 This section gives additional requirements when general aviation operations are conducted with:

- a) aeroplanes with a maximum certified take-off mass exceeding 5700 kg;
- or
- b) aeroplanes equipped with one or more turbine engines; or
- c) aeroplanes with a seating configuration of more than 9 passenger seats.

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 this section.

Note.— The term “aircraft” is used to indicate that a corporate aviation operation using a mix of aeroplanes and helicopters would be subject to this para, as long as at least one aeroplane was involved.

3.3 GENERAL

3.3.1 Compliance with laws, regulations and procedure

3.3.1.1 An 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, Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS, Volume II.

3.3.1.2 An 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. An operator shall describe the operational control system in the operations manual and identify the roles and responsibilities of those involved with the system.

3.3.1.4 An 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

Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS SERIES ‘O’ PART III

**SECTION 8
6TH JAN 2011**

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 An operator shall ensure that flight crew members demonstrate the ability to speak and understand the English language used for aeronautical radiotelephony communications as specified in appropriate CAR of Sec. 7, Series G, Part III.

3.3.2 Safety management system

3.3.2.1 An operator shall establish and maintain a safety management system that is appropriate to the size and complexity of the operation.

3.3.2.2 The safety management system should as minimum include:

a) a process to identify actual and potential safety hazards and assess the

associated risks;

b) a process to develop and implement remedial action necessary to maintain an acceptable level of safety; and

c) provision for continuous monitoring and regular assessment of the appropriateness and effectiveness of safety management activities.

Note. — *Guidance on safety management systems is contained in the Safety Management Manual (SMM) (Doc 9859).*

3.4 FLIGHT OPERATIONS

3.4.1 Operating facilities

An 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 para 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*

3.4.2 Operational management

3.4.2.1 Operator notification

3.4.2.1.1 If an operator has an operating base in a State other than the India, the operator shall notify the DGCA and 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 India

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES ‘O’ PART III**

**SECTION 8
6TH JAN 2011**

3.4.2.2 Operations manual

3.4.2.2.1 An 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. The operations manual shall be approved by DGCA.

Note. — *CAR, Section 8, Series ‘O’, Part ‘X’ contains guidance on the organization and content of an operations manual.*

3.4.2.3 Operating instructions — general

3.4.2.3.1 An 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 An operator should issue operating instructions and provide information on aeroplane climb performance 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

An 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, are followed. 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 (Doc 9683) and CAR Sec 2 Ser. B Pt.II - Preparation and use of Cockpit and emergency check list.

3.4.2.6 Minimum flight altitudes

An operator shall specify, for flights which are to be conducted in accordance with the instrument flight rules, the method of establishing terrain clearance altitudes.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

3.4.2.7 Aerodrome operating minima

3.4.2.7.1 An operator shall establish aerodrome operating minima in accordance with criteria

specified by the State of Registry, for each aerodrome to be used in operations. 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.

3.4.2.7.2 The State of Registry may approve operational credit(s) for operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals 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), a minima 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 for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in Attachment 2.B and in the 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 Manual of All-Weather Operations (Doc 9365).

3.4.2.8 Fatigue management programme

An 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. Operator shall ensure that FDTL stipulated by DGCA are followed.

3.4.2.9 Passengers

3.4.2.9.1 An 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;

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

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 An 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 An 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 An 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 para 3.8 of this CAR;
- 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 shall make available sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

3.4.3.3 Operational flight planning

An operator shall specify flight planning procedures to provide for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned. 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 Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444).

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 the Metreological conditions at the aerodrome of departure are at or below the applicable aerodrome landing minima or tat operation or 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 time from the aerodrome of departure:

- a) for aeroplanes having two engines. Not more than a distance equivalent to a flight time of onehour at the single-engine cruise speed; and with two engines, one hour of flight time at a oneengine- inoperative cruising speed, determined from the aircraft operating manual, calculated inISA and still-air conditions using the actual take-off mass; or
- b) for aeroplanes having with three or more engines. Not more than a distance equivalent to a flight time of two hours at the one-engine inoperative cruise speed. 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 aerodrome operating minima for that operation.

3.4.3.5 fuel requirement

3.4.3.5.1 An aeroplane shall carry a sufficiency 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 :

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2011**

- 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) 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 exists 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;

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

- 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

3.4.3.6 In-flight fuel management

3.4.3.6.1 An 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 replanning of the planned operation before take-off or en-route, is contained in the Flight Planning and Fuel Management Manual (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, 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 Enroute 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES ‘O’ PART III**

**SECTION 8
6TH JAN 2012**

3.4.4 In-flight procedures

3.4.4.1 Instrument approaches

3.4.4.1.1 In the aircraft operating manual as stated in 3.6.1.2 an operator should include operating procedures for conducting instrument approaches.

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 3.4.3.6.1 or 3.4.3.6.2.

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, Section 7, Chapter 3.

3.4.4.3.2 Noise abatement procedures specified by an operator for any one aeroplane type should be the same for all aerodromes.

Note. — A single procedure may not satisfy requirements at some aerodromes. A specific clearance would be required from DGCA for this.

3.4.4.4 Aeroplane operating procedures for rates of climb and decent Unless otherwise specified in an air traffic control instruction, to avoid the unnecessary airborne collision avoidance system (ACASII) resolution advisories in the aircraft at or approaching adjacent altitudes or flight levels, pilot should consider using appropriate procedures to ensure that a rate of climb and descent of less than 8m/sec or 1500 ft/min (depending on the instrumentation available) is achieved throughout the last 300m (1000ft) of climb and descent to the assigned altitude or flight level, when made aware of another aircraft at or approaching an adjacent altitude or flight level.

Note1 ---- Operations Circular 7/2010: Operational Procedures And Training Requirements Of Airborne Collision Avoidance System (ACAS) Equipment.

Note2. — Material concerning the development of these procedures is contained in PANS-OPS (Doc 8168) Volume I, Part III, Section 3, Chapter 3.

3.4.5 Duties of pilot-in-command

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

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 If an emergency situation which endangers the safety of the aeroplane or persons necessitates the taking of action which involves a violation of

regulations or procedures, the pilot-in-command / operator shall notify the nearest Air Safety office of DGCA without delay in accordance with the procedure as prescribed in CAR, Section 5, Series 'C', Part-I. In the event such emergency situation occurs outside India, the pilot-in command shall notify the appropriate local authority without delay and if required by the State in which the incident occurs, the pilot-in-command shall also submit a report of the occurrence on any such violation to the appropriate authority of such State. The pilot-in-command shall submit a copy of the occurrence report to the DGCA marked attention of Director of Air Safety (Hqrs) with a copy endorsed to the Regional Air Safety Office where the aeroplane is normally based. Such reports shall be submitted within 48 hours.

Note.— A definition of the term “serious injury” is contained in CAR, Section 5, Series 'C', Part-I.

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.

3.4.6 Cabin baggage (take-off and landing)

An operator shall specify procedures to ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.

3.5 AEROPLANE PERFORMANCE OPERATING LIMITATIONS

3.5.1 General

For aeroplanes for which Parts IIIA and IIIB of ICAO Annex 8 are not applicable because of the exemption provided for in Article 41 of the Convention, the operator 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

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 ICAO 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

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 operator 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 para 3.5.

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 requirements of this para 3.5, 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, temperature, wind, runway gradient and condition of runway, 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,

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, nor 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 ICAO 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 power-unit failing at any point in the take-off, either to discontinue the take-off and stop within the accelerate-stop distance available [or 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

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 power-unit inoperative. The aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions there from, to continue the flight to an aerodrome at which the requirements 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.

3.6 AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

Note.— Specifications for the provision of aeroplane communication and navigation equipment are contained in para 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.— Appendix 4 contains guidance on the minimum equipment list.

3.6.1.2 An 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 (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:

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

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 CAR, Section 2, Series 'X', Part-III.

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 para 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

3.6.3 Flight recorders

3.6.3.1 The requirements of flight data recorders and cockpit voice recorders are contained in CAR, Section 2, Series 'I', Part 'V' and Part 'VI' respectively. Aeroplanes on long-range over-water flights

3.6.3.2 Aeroplanes on long-range over-water flights

3.6.3.2.1 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 ICAO Annex 2.

3.6.3.2.2 Each life jacket, 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.

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

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

3.6.3.3.2 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure in personnel compartments 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 3.4.3.6.1.

3.6.3.3.3 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 shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 3.4.3.6.2.

Rev.2, 1st June 2012

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 5700 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 5700 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 15000 m (49000 ft) — radiation indicator

Aeroplanes intended to be primarily operated above 15000 m (49000 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

Rev.2, 1st June 2012

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 relevant authorities

3.6.9 Aeroplanes carrying passengers — cabin crew seats

3.6.9.1 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.

3.6.9.2 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1981

3.6.9.2.1 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.

3.6.9.2.2 Cabin crew seats provided in accordance with 3.6.9.1 or 3.6.9.2.1 shall be located near floor level and other emergency exits as required by the DGCA for emergency evacuation.

3.6.10 Aeroplanes required to be equipped with an airborne collision avoidance system (ACAS)

All aeroplanes shall be fitted with airborne collision avoidance system in accordance with CAR, Section-2, Series 'I', Part 'VIII'.

3.6.11 Aeroplanes required to be equipped with a pressure-altitude reporting Transponder

All aeroplanes shall be fitted with pressure-altitude reporting transponder in accordance with CAR, Section-2, Series 'R', Part 'IV'.

3.6.12 Microphones

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

Rev.2, 1st June 2012

Note: For high Performance aircraft FL 100/ 10000 ft. is recommended instead of Transition Altitude/ Level

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

3.6.13.1 Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, or EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the State of Registry.

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

3.6.13.2 In approving the operational use of automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall ensure that:

- a) the equipment meets the appropriate airworthiness certification requirements;
- b) the operator has carried out a safety risk assessment associated with the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;
- c) the operator has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

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

Note 2.— Guidance on operational approvals is contained in Attachment 2.B

3.7 AEROPLANE COMMUNICATION AND NAVIGATION 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/DGCA.

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.

Rev.2, 1st June 2012

The equipment installation shall be such that the failure of any single unit required for either communications or navigation purposes or both will not result in the failure of another unit required for communications or navigation purposes.

3.7.3 Electronic navigation data management

3.7.3.1 An 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 DGCA 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 equipment that will use them. The operator shall continue to monitor both 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 An operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aeroplanes that require it.

3.8 AEROPLANE MAINTENANCE

3.8.1 Operator's maintenance responsibilities

3.8.1.1 An operator shall comply with the requirements of 2.6.1.

3.8.1.2 An operator should ensure that all maintenance personnel receive initial and continuation training acceptable to the DGCA 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 (Doc 9683).

3.8.2 Operator's maintenance control manual

An 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 (Doc 9683).

Note 2.— States may provide guidance material as outlined in 3.11.2 or reference accepted industry codes of practice.

Rev.2, 1st June 2012

3.8.3 Maintenance programme

An 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.

3.8.4 An operator of an aeroplane of a maximum certificated take-off mass in excess of 5700 kg shall, as prescribed by the DGCA, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness, is transmitted as required by CAR, Section 2, Series 'C', Part 'I'.

3.8.5 Maintenance release

3.8.5.1 A maintenance release shall be completed and signed, as prescribed by the DGCA, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the DGCA.

3.8.5.2 A maintenance release shall contain a certification including:

- a) basic details of the maintenance performed;
- b) the date such maintenance was completed;
- c) when applicable, the identity of the approved maintenance organization; and
- d) the identity of the person or persons signing the release.

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

An 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.

Rev.2, 1st June 2012

3.9.3 Flight crew member training programmes

An 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.

3.9.3.2 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 3.9.4.1 Flight crew member licensing

3.9.4.1.1 An operator shall:

- a) ensure that each flight crew member assigned to duty holds a valid licence issued by the DGCA, or if issued by another Contracting State, rendered valid by the DGCA;
- 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 to Part III, Section 3, Chapter 3. Operations Circular 7/2010: Operational Procedures And Training Requirements Of Airborne Collision Avoidance System (ACAS) Equipment.

Note 2.— Appropriate training, to the satisfaction of the 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 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

An operator shall not assign a pilot to act as pilot-in-command of an aeroplane unless that pilot has made at least three take-offs and landings within the preceding 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

An operator shall not assign a co-pilot to operate at the flight controls of an aeroplane during take-off and landing unless that pilot has made at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

3.9.4.4 Pilot proficiency checks

An 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, an 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.

3.10 FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

An operator should ensure that any person assigned as a flight operations officer/flight dispatcher meets the requirements detailed in CAR, Section 7, Series M, Part II.

3.11 MANUALS, LOGS AND RECORDS

3.11.1 Operator's maintenance control manual An operator's maintenance control manual provided in accordance with 3.8.2, which may 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 maintenance records required by 3.8.5;
- e) the procedures for complying with the service information reporting requirements of CAR, Section 2, Series 'C', Part I;

- 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 unserviceabilities affecting airworthiness are recorded and rectified; and
- j) procedures for advising the 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 the DGCA; and
- d) when applicable and approved by the DGCA, condition monitoring and reliability programme descriptions for aircraft systems, components and powerplants

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 by DGCA.

3.12 CABIN CREW

3.12.1 Assignment of emergency duties An operator shall provide adequate number of cabin crew in accordance with Rule 38B of the Aircraft rules 1937, in order to effect a safe and expeditious evacuation of the aeroplane, and the necessary functions to be performed in an emergency situation 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 3.6.9 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 takeoff and landing and whenever the pilot-in- command so directs.

3.12.4 Training

3.12.4.1 An operator shall ensure that a training programme is completed by all persons before being assigned as a cabin crew member.

3.12.4.2 An 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. — Details on training programme of cabin crew is available in CAR, Section-7, Series 'M', Part-1

3.13 SECURITY

3.13.1 Security programme

Each operator including corporate operator who are using aircraft with a maximum take-off mass greater than 5700 kg, establishes, implements and maintains a written operator security programme that meets the requirements of the "Bureau of Civil Aviation Security" (BCAS).

Dr. Prabhat Kumar

Director General Civil Aviation

CARRIAGE AND USE OF OXYGEN

Supplementary to 2.2.3.8

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 Manual of Civil Aviation Medicine (Doc 8984). In the light of the above and to further assist the pilot-in-command in providing the oxygen supply intended by

2.2.3.8 of this CAR, the following guidelines, 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 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) 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 aeroplane shall 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 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 aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has required 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 shall 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	Meters	Feet
700 hpa	3000	10000
620 hpa	4000	13000
376 hpa	7600	25000

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LIGHTS TO BE DISPLAYED BY AEROPLANES

(Note.— See 2.4.8)

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 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 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.

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

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

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

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

Vertical planes. Planes perpendicular to the horizontal plane.

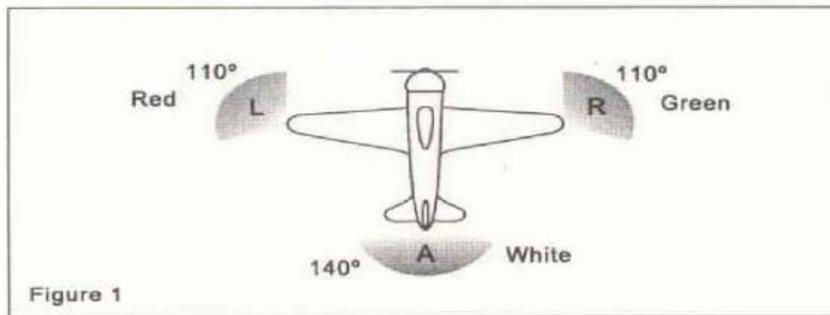
Visible. Visible on a dark night with a clear atmosphere.

2. Navigation lights to be displayed in the air

Note.— The lights specified herein are intended to meet the requirements of ICAO 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.



3. Lights to be displayed on the water

3.1 General

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

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

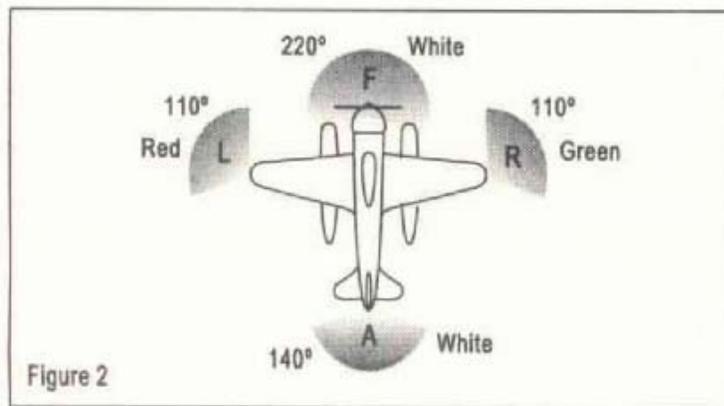
- a) when under way;
- b) when towing another vessel or aeroplane;
- c) when being towed;
- d) when not under command and not making way;
- e) when making way but not under command;
- f) when at anchor;
- g) when at ground.

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

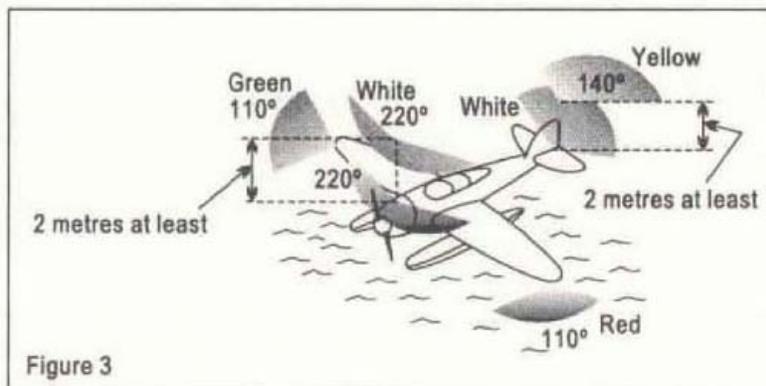
3.2 When under way

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.



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

lights:

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

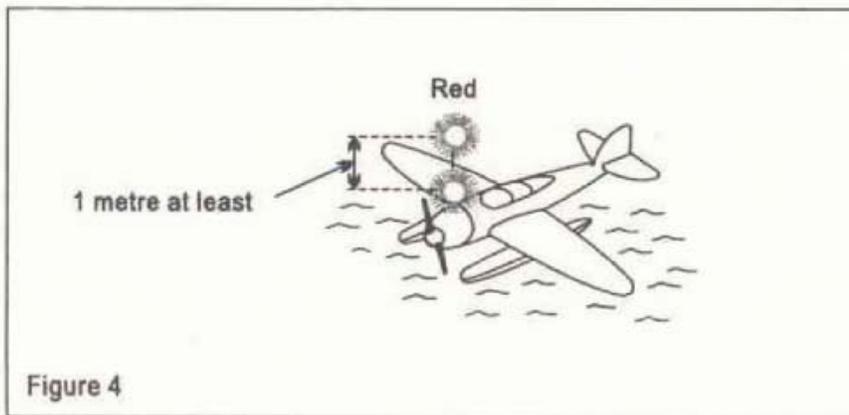
- a) the lights described in 3.2;
- b) a second light having the same characteristics as the light described in 3.2 d) and mounted in a vertical line at least 2 m above or below it; and
- c) a yellow light having otherwise the same characteristics as the light described in 3.2 c) and mounted in a vertical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

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

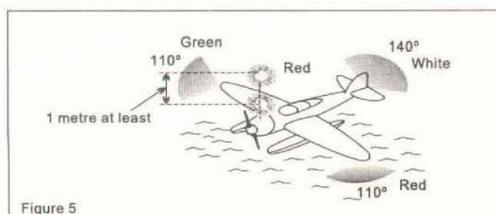
As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).



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).

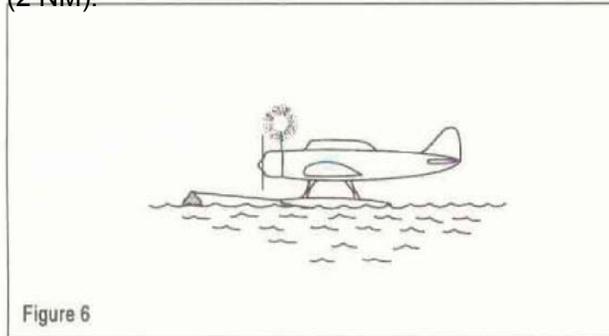
Note.— The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.



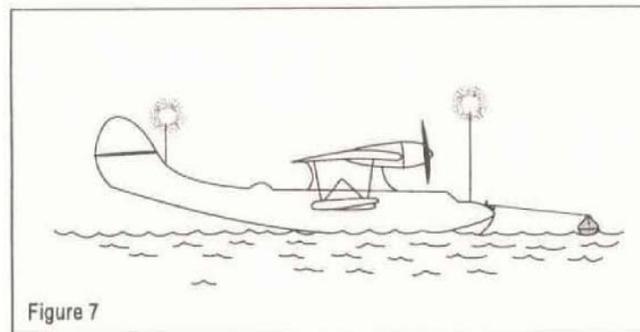
**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

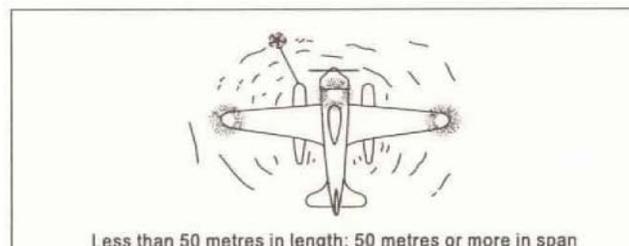
- a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).



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



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

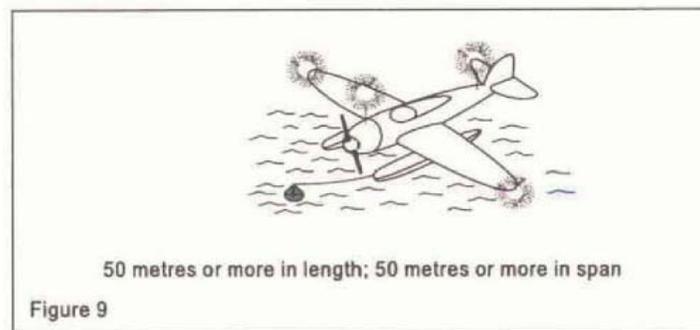


Rev.2, 1st June 2012

CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III

SECTION 8
6TH JAN 2012

craft



3.8 When on ground

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.

APPENDIX 2.3 FLIGHT RECORDERS

(Note. — See Chapter 2.4, 2.4.16)

1. General requirements

1.1 Non-deployable flight recorder containers shall:

- a) be painted a distinctive orange or yellow colour;
- b) carry reflective material to facilitate their location; and
- c) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practical date but not later than 1 January 2018, this device shall operate for a minimum of ninety days.

Note.— Current industry practice is to phase out yellow flight recorder containers at the end of the service life of the flight recorders.

Draft

Rev.3, 13th Nov 2014

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

Appendix 3

Supplementary to 3.6.1.1

1. If deviations from the requirements of DGCA 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 operator shall obtain 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 DGCA, 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 Operator shall 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 DGCA unless 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.

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

Appendix 4

**ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN
RVSM AIRSPACE**

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80 ft) in magnitude and shall have a standard deviation no greater than $28 - 0.013z^2$ for $0 \leq z \leq 25$ when z is the magnitude of the mean TVE in metres, or $92 - 0.004z^2$ for $0 \leq z \leq 80$ where z is in feet. In addition, the components of TVE shall have the following characteristics:

- a) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude;
- b) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft);and
- c) the differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

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

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

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

4. Airborne image recorder (AIR) and airborne image recording system (AIRS)

4.1 Classes

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

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

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

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

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

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.

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

Draft

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

Monitoring data from any regional monitoring programme Arrangements shall be put in place, through interregional agreement, for the sharing between regions of data from monitoring programmes.

Note.— Guidance material relating to vertical separation and monitoring of height- keeping performance is contained in the Manual on Implementation of a 300m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

Draft

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

Appendix 5

MINIMUM PERFORMANCE REQUIREMENTS FOR FIRE EXTINGUISHERS

(a) Hand fire extinguishers.

(1) The following minimum number of hand fire extinguishers must be conveniently located and evenly distributed in passenger compartments:

Passenger Capacity	No. Extinguisher
7 through 30	1
31 through 60	2
61 through 200	3
201 through 300	4
301 through 400	5
401 through 500	6
501 through 600	7
601 through 700	8

- (2) At least one hand fire extinguisher must be conveniently located in the pilot compartment.
- (3) At least one readily accessible hand fire extinguisher must be available for use in each Class A or Class B cargo or baggage compartment and in each Class E cargo or baggage compartment that is accessible to crewmembers in flight.
- (4) At least one hand fire extinguisher must be located in, or readily accessible for use in, each galley located above or below the passenger compartment.
- (5) Each hand fire extinguisher must be approved.
- (6) At least one of the required fire extinguishers located in the passenger compartment of an airplane with a passenger capacity of at least 31 and not more than 60, and at least two of the fire extinguishers located in the passenger compartment of an airplane with a passenger capacity of 61 or more must contain Halon 1211 (bromochlorodifluoromethane CBrC1F2), or equivalent, as the extinguishing agent. The type of extinguishing agent used in any other extinguisher required by this section must be appropriate for the kinds of fires likely to occur where used (7) The quantity of extinguishing agent used in each extinguisher required by this section must be appropriate for the kinds of fires likely to occur where used.
- (8) Each extinguisher intended for use in a personnel compartment must be designed to minimize the hazard of toxic gas concentration.

(b) Built-in fire extinguishers. If a built-in fire extinguisher is provided—

Rev.2, 1st June 2012

**CIVIL AVIATION REQUIREMENTS
SERIES 'O' PART III**

**SECTION 8
6TH JAN 2012**

- (1) Each built-in fire extinguishing system must be installed so that—
- (i) No extinguishing agent likely to enter personnel compartments will be hazardous to the occupants; and
- (ii) No discharge of the extinguisher can cause structural damage.
- (2) The capacity of each required built-in fire extinguishing system must be adequate for any fire likely to occur in the compartment where used, considering the volume of the compartment and the ventilation rate.

Rev.2, 1st June 2012

Draft