



## **CHAPTER 2.2**

# **FLIGHT OPERATIONS**

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

### **2.2.2 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 if radio communications are required; and
- d) has received instruction from a competent person in respect of aerodrome layout, and where appropriate, information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.



**2.2.2.2 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 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 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).*

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

- a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and
- b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:
  - 1) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;
  - 2) Category II (CAT II): a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m;



- 3) Category IIIA (CAT IIIA): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range not less than 175 m;
- 4) Category IIIB (CAT IIIB): a decision height lower than 15 m (50 ft) or no decision height and a runway visual range less than 175 m but not less than 50 m; and
- 5) Category IIIC (CAT IIIC): no decision height and no runway visual range limitations.

*Note 1.— Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category e.g. an operation with a DH in the range of CAT IIIA but with an RVR 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 RVR in the range of CAT I would be considered a CAT II operation).*

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

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

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

*Note.— For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.7.*

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



### **2.2.2.3 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; and
- e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

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 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 Chapter 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 RESERVED



### **2.2.3.3 Flight planning**

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

- a) a study of available current weather reports and forecasts; and
- b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

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

*Note 2.— 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 Meteorological 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 enable 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 (FPFM) Manual (Doc 9976).*

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

2.2.3.4.5 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 de-icing/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 De-icing/Anti-icing Operations (Doc 9640).*

### **2.2.3.5 Alternate aerodromes**

#### ***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:
  - 1) the approach and landing may be made under visual meteorological conditions; and
  - 2) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure; or
- b) the aerodrome of intended landing is isolated and:
  - 1) a standard instrument approach procedure is prescribed for the aerodrome of intended landing;



- 2) a point of no return has been determined; and
- 3) a flight shall not be continued past the point of no return unless available current meteorological information indicates that the following meteorological conditions will exist at the estimated time of use:
  - i) a cloud base of at least 300 m (1 000 ft) above the minimum associated with the instrument approach procedure; and
  - ii) visibility of at least 5.5 km (3 NM) or of 4 km (2 NM) more than the minimum associated with the instrument approach procedure.

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

### **2.2.3.6 Fuel and oil requirements**

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, or when the flight is to an isolated aerodrome, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 45 minutes at normal cruising altitude; or
- b) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is required, flight to the aerodrome of intended landing, then to an alternate aerodrome, and after that, have a final reserve fuel for at least 45 minutes at normal cruising altitude; or
- c) when the flight is conducted in accordance with the visual flight rules by day, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 30 minutes at normal cruising altitude; or
- d) when the flight is conducted in accordance with the visual flight rules by night, flight to the aerodrome of intended landing and thereafter have a final reserve fuel for at least 45 minutes at normal cruising altitude.

*Note 1.— Nothing in 2.2.3.6 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.*

*Note 2.— Guidance on planning operations to isolated aerodromes is contained in the Flight Planning and Fuel Management (FPFM) 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 refuelled 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 1.— The provisions of 2.2.3.7.1 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refuelling.*

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

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

### **2.2.3.8 Oxygen supply**

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

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

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

<b>Absolute pressure</b>	<b>Metres</b>	<b>Feet</b>
700 hPa	3 000	10 000
620 hPa	4 000	13 000
376 hPa	7 600	25 000





## **2.2.4 In-flight procedures**

### **2.2.4.1 Aerodrome operating 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.

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

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

2.2.4.1.3 If, after entering the final approach segment or after descending below 300 m (1 000 ft) above the aerodrome elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an aeroplane 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, midpoint and stop-end) used to determine whether operating minima are or are not met. Where RVR is used, the controlling RVR is the touchdown RVR, unless otherwise specified by State criteria.*

### **2.2.4.2 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 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 seat belt must remain fastened.

*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:**

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

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



#### **2.2.4.7 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 MAYDAYMAYDAY 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, 5.3.2.1.1, 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 State in which the aerodrome is located to serve each instrument runway or aerodrome utilized for instrument flight operations.

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

*Note 1.— See 2.2.2.2.1 for instrument approach operation classifications.*



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

### **2.2.5 Duties of pilot-in-command**

2.2.5.1 The pilot-in-command shall be responsible for the operation, safety and security of the 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 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 ICAO Annex 13.*

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

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

### **2.2.7 Operators to ensure that crew comply with interception orders**

2.2.7.1 An Operator shall ensure that their crew receive appropriate trainings on and comply with Interception Orders from other States.

2.2.7.2 Attachment 1 A contains the instructions that crew of an intercepted aircraft must follow when complying with Interception Orders from Interceptor aircraft of other States.