

## I

(Acts adopted under the EC Treaty/Euratom Treaty whose publication is obligatory)

## REGULATIONS

## COMMISSION REGULATION (EC) No 859/2008

of 20 August 2008

**amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane**

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation <sup>(1)</sup>, and in particular Article 11(1) thereof,

Whereas:

(1) Regulation (EEC) No 3922/91 provides that the Commission shall adopt the amendments to the common technical requirements and administrative procedures listed in Annex III thereto which are necessitated by scientific and technical progress;

(2) Annex III to Regulation (EEC) No 3922/91 is based on a set of harmonised rules adopted by the Joint Aviation Authorities (JAA) called Joint Aviation Requirements for Commercial Air Transportation (Aeroplanes) (JAR-OPS 1).

(3) Regulation (EEC) 8/2008 <sup>(2)</sup> updated Annex III in order to reflect the amendments made to JAR-OPS since 1 January 2005 (Amendments 9 to 12) before the date on which that Annex will become applicable (16 July 2008)

(4) On the basis of further work conducted by the European Air Safety Agency, and pending the adoption of the implementing regulations provided in Regulation (EC) 8/2008, that Annex should be amended again in order to include certain detailed technical and operational requirements relating to the most crucial safety elements of that Annex.

(5) These new requirements should be applicable without delay. However, a lead time is needed by the industry and the authorities for the implementation of complex provisions pertaining to all weather operations and cabin crew training;

(6) Annex III to Regulation (EEC) No 3922/91 should therefore be amended accordingly.

(7) The measures provided for in this Regulation are in accordance with the opinion of the Air Safety Committee established by Article 12 of Regulation (EEC) No 3922/91,

HAS ADOPTED THIS REGULATION:

*Article 1*

Annex III to Council Regulation (EEC) No 3922/1991 is replaced by the Annex to this Regulation.

*Article 2*

<sup>(1)</sup> OJ L 373, 31.12.1991, p. 4.

<sup>(2)</sup> OJ L 10, 12.1.2008, p. 1

1. This Regulation shall enter into force on the day of its publication in the *Official Journal of the European Union*.

2. The provisions of the Annex of this Regulation concerning OPS 1.1005, OPS 1.1010, OPS 1.1015, Appendix 1 to OPS 1.1005, Appendix 1 to OPS 1.1010, Appendix 1 to OPS 1.1015 and Appendix 3 to OPS 1.1005/1.1010/1.1015 shall apply from 16 July 2009.

3. The provisions of the Annex of this Regulation concerning OPS 1.430, OPS 1.435, OPS 1.440, OPS 1.450, OPS 1.455,

OPS 1.460, Appendix 1 to OPS 1.430, Appendix 1 to OPS 1.440, Appendix 1 to OPS 1.450 and Appendix 1 to OPS 1.455 shall apply from 16 July 2011.

4. Pending the application of the provisions referred to in paragraphs 2 and 3, the corresponding provisions of the Annex to Regulation (EEC) 8/2008 shall continue to apply.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 20 August 2008.

*For the Commission*  
Antonio TAJANI  
Vice-President

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## ANNEX

## ‘ANNEX III

Common technical requirements and administrative procedures applicable to commercial transportation by aircraft

OPS 1: Commercial air transportation (aeroplanes)

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## SUBPART A

## APPLICABILITY AND DEFINITIONS

## OPS 1.001

**Applicability**

OPS Part 1 prescribes requirements applicable to the operation of any civil aeroplane for the purpose of commercial air transportation by any operator whose principal place of business and, if any, registered office is in a Member State, hereafter called operator. OPS 1 does not apply:

1. to aeroplanes when used in military, customs and police services; nor
2. to parachute dropping and fire-fighting flights, and to associated positioning and return flights in which the persons carried are those who would normally be carried on parachute dropping or fire-fighting; nor
3. to flights immediately before, during, or immediately after an aerial work activity provided these flights are connected with that aerial work activity and in which, excluding crew members, no more than 6 persons indispensable to the aerial work activity are carried.

## OPS 1.003

**Definitions**

(a) For the purpose of this Annex:

1. “accepted/acceptable” means not objected to by the Authority as suitable for the purpose intended.
2. “approved (by the Authority)” means documented (by the Authority) as suitable for the purpose intended.
3. “Master minimum equipment list (MMEL)” means a master list (including a preamble) appropriate to an aircraft type which determines those instruments, items of equipment or functions that, while maintaining the level of safety intended in the applicable airworthiness certification specifications, may temporarily be inoperative either due to the inherent redundancy of the design, and/or due to specified operational and maintenance procedures, conditions and limitations, and in accordance with the applicable procedures for Continued Airworthiness.
4. “Minimum equipment list (MEL)” means a list (including a preamble) which provides for the operation of aircraft, under specified conditions, with particular instruments, items of equipment or functions inoperative at the commencement of flight. This list is prepared by the operator for his own particular aircraft taking account of their aircraft definition and the relevant operational and maintenance conditions in accordance with a procedure approved by the Authority.

(b) Part M and Part 145 as referred to in this Annex are those of Commission Regulation (EC) No 2042/2003 <sup>(1)</sup>.

<sup>(1)</sup> OJ L 315, 28.11.2003, p. 1.

## SUBPART B

## GENERAL

## OPS 1.005

**General**

- (a) An operator shall not operate an aeroplane for the purpose of commercial air transportation other than in accordance with OPS Part 1. For operations of Performance Class B aeroplanes, alleviated requirements can be found in Appendix 1 to OPS 1.005(a).
- (b) An operator shall comply with the applicable retroactive airworthiness requirements for aeroplanes operated for the purpose of commercial air transportation.
- (c) Each aeroplane shall be operated in compliance with the terms of its Certificate of Airworthiness and within the approved limitations contained in its Aeroplane Flight Manual.
- (d) All synthetic training devices (STD), such as flight simulators or flight training devices (FTD), replacing an aeroplane for training and/or checking purposes are to be qualified in accordance with the requirements applicable to synthetic training devices. An operator intending to use such STD must obtain approval from the Authority.

## OPS 1.020

**Laws, regulations and procedures — Operator's responsibilities**

An operator must ensure that:

- 1. all employees are made aware that they shall comply with the laws, regulations and procedures of those States in which operations are conducted and which are pertinent to the performance of their duties; and
- 2. all crew members are familiar with the laws, regulations and procedures pertinent to the performance of their duties.

## OPS 1.025

**Common language**

- (a) An operator must ensure that all crew members can communicate in a common language.
- (b) An operator must ensure that all operations personnel are able to understand the language in which those parts of the Operations Manual which pertain to their duties and responsibilities are written.

## OPS 1.030

**Minimum equipment lists — Operator's responsibilities**

- (a) An operator shall establish, for each aeroplane, a minimum equipment list (MEL) approved by the Authority. This shall be based upon, but no less restrictive than, the relevant master minimum equipment list (MMEL) (if this exists) accepted by the Authority.
- (b) An operator shall not operate an aeroplane other than in accordance with the MEL unless permitted by the Authority. Any such permission will in no circumstances permit operation outside the constraints of the MMEL.

## OPS 1.035

**Quality system**

- (a) An operator shall establish one quality system and designate one quality manager to monitor compliance with, and adequacy of, procedures required to ensure safe operational practices and airworthy aeroplanes. Compliance monitoring must include a feed-back system to the accountable manager (see also OPS 1.175 (h)) to ensure corrective action as necessary.
- (b) The quality system must include a quality assurance programme that contains procedures designed to verify that all operations are being conducted in accordance with all applicable requirements, standards and procedures.
- (c) The quality system and the quality manager must be acceptable to the Authority.
- (d) The quality system must be described in relevant documentation.
- (e) Notwithstanding subparagraph (a) above, the Authority may accept the nomination of two quality managers, one for operations and one for maintenance provided that the operator has designated one Quality Management Unit to ensure that the quality system is applied uniformly throughout the entire operation.

## OPS 1.037

**Accident prevention and flight safety programme**

- (a) An operator shall establish and maintain an accident prevention and flight safety programme, which may be integrated with the quality system, including:
  - 1. programmes to achieve and maintain risk awareness by all persons involved in operations; and
  - 2. an occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interests of flight safety. The scheme shall protect the identity of the reporter and include the possibility that reports may be submitted anonymously; and
  - 3. evaluation of relevant information relating to accidents and incidents and the promulgation of related information, but not the attribution of blame; and
  - 4. a flight data monitoring programme for those aeroplanes in excess of 27 000 kg MCTOM. Flight data monitoring (FDM) is the pro-active use of digital flight data from routine operations to improve aviation safety. The flight data monitoring programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data; and
  - 5. the appointment of a person accountable for managing the programme.
- (b) Proposals for corrective action resulting from the accident prevention and flight safety programme shall be the responsibility of the person accountable for managing the programme.
- (c) The effectiveness of changes resulting from proposals for corrective action identified by the accident and flight safety programme shall be monitored by the quality manager.

## OPS 1.040

**Crew members**

- (a) An operator shall ensure that all operating flight and cabin crew members have been trained in, and are proficient to perform, their assigned duties.

- (b) Where there are crew members, other than cabin crew members, who carry out their duties in the passenger compartment of an aeroplane, an operator shall ensure that these:
1. are not confused by the passengers with the cabin crew members;
  2. do not occupy required cabin crew assigned stations;
  3. do not impede the cabin crew members in their duties.

OPS 1.050

#### **Search and rescue information**

An operator shall ensure that essential information pertinent to the intended flight concerning search and rescue services is easily accessible on the flight deck.

OPS 1.055

#### **Information on emergency and survival equipment carried**

An operator shall ensure that there are available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board all of his aeroplanes. 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 emergency portable radio equipment.

OPS 1.060

#### **Ditching**

An operator shall not operate an aeroplane with an approved passenger seating configuration of more than 30 passengers on overwater flights at a distance from land suitable for making an emergency landing, greater than 120 minutes at cruising speed, or 400 nautical miles, whichever is the lesser, unless the aeroplane complies with the ditching requirements prescribed in the applicable airworthiness code.

OPS 1.065

#### **Carriage of weapons of war and munitions of war**

- (a) An operator shall not transport weapons of war and munitions of war by air unless an approval to do so has been granted by all States concerned.
- (b) An operator shall ensure that weapons of war and munitions of war are:
1. stowed in the aeroplane in a place which is inaccessible to passengers during flight; and
  2. in the case of firearms, unloaded;

unless, before the commencement of the flight, approval has been granted by all States concerned that such weapons of war and munitions of war may be carried in circumstances that differ in part or in total from those indicated in this subparagraph.

- (c) An operator shall ensure that the commander is notified before a flight begins of the details and location on board the aeroplane of any weapons of war and munitions of war intended to be carried.

## OPS 1.070

**Carriage of sporting weapons and ammunition**

- (a) An operator shall take all reasonable measures to ensure that any sporting weapons intended to be carried by air are reported to him.
- (b) An operator accepting the carriage of sporting weapons shall ensure that they are:
  - 1. stowed in the aeroplane in a place which is inaccessible to passengers during flight unless the Authority has determined that compliance is impracticable and has accepted that other procedures might apply; and
  - 2. in the case of firearms or other weapons that can contain ammunition, unloaded.
- (c) Ammunition for sporting weapons may be carried in passengers' checked baggage, subject to certain limitations, in accordance with the Technical Instructions (see OPS 1.1160 (b)(5)) as defined in OPS 1.1150 (a)(15).

## OPS 1.075

**Method of carriage of persons**

An operator shall take all measures to ensure that no person is in any part of an aeroplane in flight which is not a part designed for the accommodation of persons unless temporary access has been granted by the commander to any part of the aeroplane:

- 1. for the purpose of taking action necessary for the safety of the aeroplane or of any person, animal or goods therein; or
- 2. in which cargo or stores are carried, being a part which is designed to enable a person to have access thereto while the aeroplane is in flight.

## OPS 1.080

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## OPS 1.085

**Crew responsibilities**

- (a) A crew member shall be responsible for the proper execution of his/her duties that:
  - 1. are related to the safety of the aeroplane and its occupants; and
  - 2. are specified in the instructions and procedures laid down in the Operations Manual.
- (b) A crew member shall:
  - 1. report to the commander any fault, failure, malfunction or defect which he/she believes may affect the airworthiness or safe operation of the aeroplane including emergency systems;
  - 2. report to the commander any incident that endangered, or could have endangered, the safety of operation;
  - 3. make use of the operator's occurrence reporting schemes in accordance with OPS 1.037(a)(2). In all such cases, a copy of the report(s) shall be communicated to the commander concerned.
- (c) Nothing in paragraph (b) above shall oblige a crew member to report an occurrence which has already been reported by another crew member.



- (d) A crew member shall not perform duties on an aeroplane:
1. while under the influence of any drug that may affect his/her faculties in a manner contrary to safety;
  2. following deep sea diving except when a reasonable time period has elapsed;
  3. following blood donation except when a reasonable time period has elapsed;
  4. if applicable medical requirements are not fulfilled, or if he/she is in any doubt of being able to accomplish his/her assigned duties; or
  5. if he/she knows or suspects that he/she is suffering from fatigue, or feels unfit to the extent that the flight may be endangered.
- (e) A crew member shall be subject to appropriate requirements on the consumption of alcohol which shall be established by the operator and acceptable by the Authority, and which shall not be less restrictive than the following:
1. no alcohol shall be consumed less than eight hours prior to the specified reporting time for flight duty or the commencement of standby;
  2. the blood alcohol level shall not exceed 0,2 promille at the start of a flight duty period;
  3. no alcohol shall be consumed during the flight duty period or whilst on standby.
- (f) The commander shall:
1. be responsible for the safety of all crew members, passengers and cargo on board, as soon as he/she arrives on board, until he/she leaves the aeroplane at the end of the flight;
  2. be responsible for the operation and safety of the aeroplane from the moment the aeroplane is first ready to move for the purpose of taxiing prior to take-off until the moment it finally comes to rest at the end of the flight and the engine(s) used as primary propulsion units are shut down;
  3. have authority to give all commands he/she deems necessary for the purpose of securing the safety of the aeroplane and of persons or property carried therein;
  4. have authority to disembark any person, or any part of the cargo, which, in his/her opinion, may represent a potential hazard to the safety of the aeroplane or its occupants;
  5. not allow a person to be carried in the aeroplane who appears to be under the influence of alcohol or drugs to the extent that the safety of the aeroplane or its occupants is likely to be endangered;
  6. have the right to refuse transportation of inadmissible passengers, deportees or persons in custody if their carriage poses any risk to the safety of the aeroplane or its occupants;
  7. ensure that all passengers are briefed on the location of emergency exits and the location and use of relevant safety and emergency equipment;
  8. ensure that all operational procedures and check lists are complied with in accordance with the Operations Manual;
  9. not permit any crew member to perform any activity during take-off, initial climb, final approach and landing except those duties required for the safe operation of the aeroplane;
  10. not permit:
    - (i) a flight data recorder to be disabled, switched off or erased during flight nor permit recorded data to be erased after flight in the event of an accident or an incident subject to mandatory reporting;
    - (ii) a cockpit voice recorder to be disabled or switched off during flight unless he/she believes that the recorded data, which otherwise would be erased automatically, should be preserved for incident or accident investigation nor permit recorded data to be manually erased during or after flight in the event of an accident or an incident subject to mandatory reporting;

11. decide whether or not to accept an aeroplane with unserviceabilities allowed by the CDL or MEL; and
  12. ensure that the pre-flight inspection has been carried out.
- (g) The commander or the pilot to whom conduct of the flight has been delegated shall, in an emergency situation that requires immediate decision and action, take any action he/she considers necessary under the circumstances. In such cases he/she may deviate from rules, operational procedures and methods in the interest of safety.

*OPS 1.090*

**Authority of the commander**

An operator shall take all reasonable measures to ensure that all persons carried in the aeroplane obey all lawful commands given by the commander for the purpose of securing the safety of the aeroplane and of persons or property carried therein.

*OPS 1.095*

**Authority to taxi an aeroplane**

An operator shall take all reasonable steps to ensure that an aeroplane in his charge is not taxied on the movement area of an aerodrome by a person other than a flight crew member, unless that person, seated at the controls:

1. has been duly authorised by the operator or a designated agent and is competent to;
  - (i) taxi the aeroplane;
  - (ii) use the radio telephone; and
2. has received instruction in respect of aerodrome layout, routes, signs, marking, lights, air traffic control signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

*OPS 1.100*

**Admission to flight deck**

- (a) An operator must ensure that no person, other than a flight crew member assigned to a flight, is admitted to, or carried in, the flight deck unless that person is:
1. an operating crew member;
  2. a representative of the Authority responsible for certification, licensing or inspection if this is required for the performance of his/her official duties; or
  3. permitted by, and carried in accordance with instructions contained in the Operations Manual.
- (b) The commander shall ensure that:
1. in the interests of safety, admission to the flight deck does not cause distraction and/or interfere with the flight's operation; and
  2. all persons carried on the flight deck are made familiar with the relevant safety procedures.
- (c) The final decision regarding the admission to the flight deck shall be the responsibility of the commander.

## OPS 1.105

**Unauthorised carriage**

An operator shall take all reasonable measures to ensure that no person secretes himself/herself or secretes cargo on board an aeroplane.

## OPS 1.110

**Portable electronic devices**

An operator shall not permit any person to use, and take all reasonable measures to ensure that no person does use, on board an aeroplane a portable electronic device that can adversely affect the performance of the aeroplane's systems and equipment.

## OPS 1.115

**Alcohol and drugs**

An operator shall not permit any person to enter or be in, and take all reasonable measures to ensure that no person enters or is in, an aeroplane when under the influence of alcohol or drugs to the extent that the safety of the aeroplane or its occupants is likely to be endangered.

## OPS 1.120

**Endangering safety**

An operator shall take all reasonable measures to ensure that no person recklessly or negligently acts or omits to act:

1. so as to endanger an aeroplane or person therein;
2. so as to cause or permit an aeroplane to endanger any person or property.

## OPS 1.125

**Documents to be carried**

(a) An operator shall ensure that the following documents or copies thereof are carried on each flight:

1. the Certificate of Registration;
2. the Certificate of Airworthiness;
3. the original or a copy of the Noise Certificate (if applicable), including an English translation, where one has been provided by the Authority responsible for issuing the noise certificate;
4. the original or a copy of the Air Operator Certificate;
5. the Aircraft Radio Licence; and
6. the original or a copy of the Third Party Liability Insurance Certificate(s).

(b) Each flight crew member shall, on each flight, carry a valid flight crew licence with appropriate rating(s) for the purpose of the flight.

## OPS 1.130

**Manuals to be carried**

An operator shall ensure that:

1. the current parts of the Operations Manual relevant to the duties of the crew are carried on each flight;
2. those parts of the Operations Manual which are required for the conduct of a flight are easily accessible to the crew on board the aeroplane; and
3. the current Aeroplane Flight Manual is carried in the aeroplane unless the Authority has accepted that the Operations Manual prescribed in OPS 1.1045, Appendix 1, Part B contains relevant information for that aeroplane.

## OPS 1.135

**Additional information and forms to be carried**

- (a) An operator shall ensure that, in addition to the documents and manuals prescribed in OPS 1.125 and OPS 1.130, the following information and forms, relevant to the type and area of operation, are carried on each flight:
  1. Operational Flight Plan containing at least the information required in OPS 1.1060;
  2. Aeroplane Technical Log containing at least the information required in Part M, paragraph M. A. 306 Operator's technical log system;
  3. details of the filed ATS flight plan;
  4. appropriate NOTAM/AIS briefing documentation;
  5. appropriate meteorological information;
  6. mass and balance documentation as specified in Subpart J;
  7. notification of special categories of passenger such as security personnel, if not considered as crew, handicapped persons, inadmissible passengers, deportees and persons in custody;
  8. notification of special loads including dangerous goods including written information to the commander as prescribed in OPS 1.1215 (c);
  9. current maps and charts and associated documents as prescribed in OPS 1.290 (b)(7);
  10. any other documentation which may be required by the States concerned with this flight, such as cargo manifest, passenger manifest etc; and
  11. forms to comply with the reporting requirements of the Authority and the operator.
- (b) The Authority may permit the information detailed in subparagraph (a) above, or parts thereof, to be presented in a form other than on printed paper. An acceptable standard of accessibility, usability and reliability must be assured.

## OPS 1.140

**Information retained on the ground**

- (a) An operator shall ensure that:

At least for the duration of each flight or series of flights;

- (i) information relevant to the flight and appropriate for the type of operation is preserved on the ground; and
- (ii) the information is retained until it has been duplicated at the place at which it will be stored in accordance with OPS 1.1065; or, if this is impracticable,
- (iii) the same information is carried in a fireproof container in the aeroplane.

- (b) The information referred to in subparagraph (a) above includes:
1. a copy of the operational flight plan where appropriate;
  2. copies of the relevant part(s) of the aeroplane technical log;
  3. route specific NOTAM documentation if specifically edited by the operator;
  4. mass and balance documentation if required (OPS 1.625 refers); and
  5. special loads notification.

*OPS 1.145*

**Power to inspect**

An operator shall ensure that any person authorised by the Authority is permitted at any time to board and fly in any aeroplane operated in accordance with an AOC issued by that Authority and to enter and remain on the flight deck provided that the commander may refuse access to the flight deck if, in his/her opinion, the safety of the aeroplane would thereby be endangered.

*OPS 1.150*

**Production of documentation and records**

- (a) An operator shall:
1. give any person authorised by the Authority access to any documents and records which are related to flight operations or maintenance; and
  2. produce all such documents and records, when requested to do so by the Authority, within a reasonable period of time.
- (b) The commander shall, within a reasonable time of being requested to do so by a person authorised by an Authority, produce to that person the documentation required to be carried on board.

*OPS 1.155*

**Preservation of documentation**

An operator shall ensure that:

1. any original documentation, or copies thereof, that he is required to preserve is preserved for the required retention period even if he ceases to be the operator of the aeroplane; and
2. where a crew member, in respect of whom an operator has kept flight duty, duty and rest period records, becomes a crew member for another operator, that record is made available to the new operator.

*OPS 1.160*

**Preservation, production and use of flight recorder recordings**

- (a) Preservation of recordings:
1. Following an accident, the operator of an aeroplane on which a flight recorder is carried shall, to the extent possible, preserve the original recorded data pertaining to that accident, as retained by the recorder for a period of 60 days unless otherwise directed by the investigating authority.
  2. Unless prior permission has been granted by the Authority, following an incident that is subject to mandatory reporting, the operator of an aeroplane on which a flight recorder is carried shall, to the extent possible, preserve the original recorded data pertaining to that incident, as retained by the recorder for a period of 60 days unless otherwise directed by the investigating authority.

3. Additionally, when the Authority so directs, the operator of an aeroplane on which a flight recorder is carried shall preserve the original recorded data for a period of 60 days unless otherwise directed by the investigating authority.
  4. When a flight data recorder is required to be carried aboard an aeroplane, the operator of that aeroplane shall:
    - (i) save the recordings for the period of operating time as required by OPS 1.715, 1.720 and 1.725 except that, for the purpose of testing and maintaining flight data recorders, up to one hour of the oldest recorded material at the time of testing may be erased; and
    - (ii) keep a document which presents the information necessary to retrieve and convert the stored data into engineering units.
- (b) Production of recordings
- The operator of an aeroplane on which a flight recorder is carried shall, within a reasonable time after being requested to do so by the Authority, produce any recording made by a flight recorder which is available or has been preserved.
- (c) Use of recordings
1. The cockpit voice recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except with the consent of all crew members concerned.
  2. The flight data recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except when such records are:
    - (i) used by the operator for airworthiness or maintenance purposes only; or
    - (ii) de-identified; or
    - (iii) disclosed under secure procedures.

#### OPS 1.165

#### **Leasing**

(a) Terminology

Terms used in this paragraph have the following meaning:

1. dry lease — is when the aeroplane is operated under the AOC of the lessee.
2. wet lease — is when the aeroplane is operated under the AOC of the lessor.

(b) Leasing of aeroplanes between Community operators

1. Wet lease-out. A Community operator providing an aeroplane and complete crew to another Community operator, in accordance with Council Regulation (EEC) No 2407/92 of 23 July 1992 on licensing of air carriers <sup>(1)</sup>, and retaining all the functions and responsibilities prescribed in Subpart C, shall remain the operator of the aeroplane.
2. All leases except wet lease-out
  - (i) Except as provided by subparagraph (b)(1) above, a Community operator utilising an aeroplane from, or providing it to, another Community operator, must obtain prior approval for the operation from his respective Authority. Any conditions which are part of this approval must be included in the lease agreement.

<sup>(1)</sup> OJ L 240, 24.8.1992, p. 1.

- (ii) Those elements of lease agreements which are approved by the Authority, other than lease agreements in which an aeroplane and complete crew are involved and no transfer of functions and responsibilities is intended, are all to be regarded, with respect to the leased aeroplane, as variations of the AOC under which the flights will be operated.
  - (c) Leasing of aeroplanes between a Community operator and any entity other than a Community operator:
    - 1. Dry lease-in
      - (i) A Community operator shall not dry lease-in an aeroplane from an entity other than another Community operator, unless approved by the Authority. Any conditions which are part of this approval must be included in the lease agreement.
      - (ii) A Community operator shall ensure that, with regard to aeroplanes that are dry leased-in, any differences from the requirements prescribed in Subparts K, L, and/or OPS 1.005(b), are notified to and are acceptable to the Authority.
    - 2. Wet lease-in
      - (i) A Community operator shall not wet lease-in an aeroplane from an entity other than another Community operator without the approval of the Authority.
      - (ii) A Community operator shall ensure that, with regard to aeroplanes that are wet leased-in:
        - (A) the safety standards of the lessor with respect to maintenance and operation are equivalent to those established by the present Regulation;
        - (B) the lessor is an operator holding an AOC issued by a State which is a signatory to the Chicago Convention;
        - (C) the aeroplane has a standard Certificate of Airworthiness issued in accordance with ICAO Annex 8. Standard Certificates of Airworthiness issued by a Member State other than the State responsible for issuing the AOC, will be accepted without further showing when issued in accordance with Part 21; and
        - (D) any requirement made applicable by the lessee's Authority is complied with.
    - 3. Dry lease-out

A Community operator may dry lease-out an aeroplane for the purpose of commercial air transportation to any operator of a State which is signatory to the Chicago Convention provided that the following conditions are met:

      - (A) The Authority exempted the operator from the relevant provisions of OPS Part 1 and, after the foreign regulatory authority has accepted responsibility in writing for surveillance of the maintenance and operation of the aeroplane(s), has removed the aeroplane from its AOC; and
      - (B) The aeroplane is maintained according to an approved maintenance programme.
    - 4. Wet lease-out

A Community operator providing an aeroplane and complete crew to another entity, in accordance with Regulation (EEC) No 2407/92, and retaining all the functions and responsibilities prescribed in Subpart C, shall remain the operator of the aeroplane.
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*Appendix 1 to OPS 1.005 (a)***Operations of performance class B aeroplanes**

## (a) Terminology

1. A to A operations — Take-off and landing are made at the same place.
2. A to B operations — Take-off and landing are made at different places.
3. 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 the appropriate authority.

## (b) Operations, to which this Appendix is applicable, may be conducted in accordance with the following alleviations.

1. OPS 1.035 Quality System: In the case of a very small operator, the post of Quality Manager may be held by a nominated postholder if external auditors are used. This applies also where the accountable manager is holding one or several of the nominated posts.
2. Reserved
3. OPS 1.075 Methods of carriage of persons: Not required for VFR operations of single engine aeroplanes.
4. OPS 1.100 Admission to the flight deck:
  - (i) An operator must establish rules for the carriage of passengers in a pilot seat.
  - (ii) The commander must ensure that:
    - A. carriage of passengers in a pilot seat does not cause distraction and/or interference with the operation of the flight; and
    - B. the passenger occupying a pilot seat is made familiar with the relevant restrictions and safety procedures.
5. OPS 1.105 Unauthorised Carriage: Not required for VFR operations of single engine aeroplanes.
6. OPS 1.135 Additional information and forms to be carried:
  - (i) For A to A VFR operations of single engine aeroplanes by day, the following documents need not be carried:
    - (A) operational flight plan;
    - (B) aeroplane technical log;
    - (C) NOTAM/AIS briefing documentation;
    - (D) meteorological information;
    - (E) notification of special categories of passengers ... etc.; and
    - (F) notification of special loads including dangerous goods ... etc.
  - (ii) For A to B VFR operations of single engine aeroplanes by day, notification of special categories of passengers as described in OPS 1.135 (a)(7) does not need to be carried.
  - (iii) For A to B VFR operations by day, the operational flight plan may be in a simplified form and must meet the needs of the type of operation.



7. OPS 1.215 Use of Air Traffic Services: For VFR operations of single engine aeroplanes by day, non mandatory contact with ATS shall be maintained to the extent appropriate to the nature of the operation. Search and rescue services must be ensured in accordance with OPS 1.300.
8. OPS 1.225 Aerodrome Operating Minima: For VFR operations, the standard VFR operating minima will normally cover this requirement. Where necessary, the operator shall specify additional requirements taking into account such factors as radio coverage, terrain, nature of sites for take-off and landing, flight conditions and ATS capacity.
9. OPS 1.235 Noise abatement procedures: Not applicable to VFR operations of single engine aeroplanes.
10. OPS 1.240 Routes and Areas of Operation:

Subparagraph (a)(1) is not applicable to A to A VFR operations of single engine aeroplanes by day.

11. OPS 1.250 Establishment of minimum flight altitudes:

For VFR operations by day, this requirement is applicable as follows. An operator shall ensure that operations are only conducted along such routes or within such areas for which a safe terrain clearance can be maintained and shall take account of such factors as temperature, terrain, unfavourable meteorological conditions (e.g. severe turbulence and descending air currents, corrections for temperature and pressure variations from standard values).

12. OPS 1.255 Fuel Policy:

- (i) For A to A Flights — An operator shall specify the minimum fuel contents at which a flight must end. This minimum, final reserve, fuel must not be less than the amount needed to fly for a period of 45 minutes.
- (ii) For A to B Flights — An operator shall ensure that the pre-flight calculation of usable fuel required for a flight includes;

(A) Taxi fuel — Fuel consumed before take-off, if significant; and

(B) Trip fuel (Fuel to reach the destination); and

(C) Reserve fuel –

1. Contingency fuel — Fuel that is not less than 5 % of the planned trip fuel or, in the event of in-flight re-planning, 5 % of the trip fuel for the remainder of the flight; and
2. Final reserve fuel — Fuel to fly for an additional period of 45 minutes (piston engines) or 30 minutes (turbine engines); and

(D) Alternate fuel — Fuel to reach the destination alternate via the destination, if a destination alternate is required; and

(E) Extra fuel — Fuel that the commander may require in addition to that required under subparagraphs (A)-(D) above.

13. OPS 1.265 Carriage of inadmissible passengers, deportees or persons in custody: For VFR operations of single engine aeroplanes and where it is not intended to carry inadmissible passengers, deportees or persons in custody, an operator is not required to establish procedures for the carriage of such passengers.
14. OPS 1.280 Passenger Seating: Not Applicable to VFR operations of single engine aeroplanes.
15. OPS 1.285 Passenger Briefing: Demonstration and briefing shall be given as appropriate to the kind of operations. In single pilot operations, the pilot may not be allocated tasks distracting him/her from his/her flying duties.
16. OPS 1.290 Flight Preparation:
  - (i) operational flight plan for A to A operations — Not Required.
  - (ii) A to B operations under VFR by day — An operator shall ensure that a simplified form of an operational flight plan which is relevant to the type of operation is completed for each flight.

17. OPS 1.295 Selection of aerodromes: Not applicable to VFR operations. The necessary instructions for the use of aerodromes and sites for take-off and landing are to be issued with reference to OPS 1.220.
18. OPS 1.310 Crew members at stations:

For VFR operations, instructions on this matter are required only where two pilot operations are conducted.
19. OPS 1.375 In-flight fuel management:

Appendix 1 to OPS 1.375 is not required to be applied to VFR operations of single engine aeroplanes by day.
20. OPS 1.405 Commencement and continuation of approach:

Not applicable to VFR operations.
21. OPS 1.410 Operating procedures — threshold crossing height:

Not applicable to VFR operations.
22. OPS 1.430 to 1.460, including appendices:

Not applicable to VFR operations.
23. OPS 1.530 Take-off:
  - (i) Subparagraph (a) applies with the following addition. The Authority may, on a case-by-case basis, accept other performance data produced by the operator and based on demonstration and/or documented experience. Subparagraphs (b) and (c) apply with the following addition. Where the requirements of this paragraph cannot be complied with due to physical limitations relating to extending the runway and there is a clear public interest and necessity for the operation, the Authority may accept, on a case-by-case basis, other performance data, not conflicting with the Aeroplane Flight Manual relating to special procedures, produced by the operator based on demonstration and/or documented experience.
  - (ii) An operator wishing to conduct operations according to subparagraph (i) must have the prior approval of the Authority issuing the AOC. Such an approval will:
    - (A) specify the type of aeroplane;
    - (B) specify the type of operation;
    - (C) specify the aerodrome(s) and runways concerned;
    - (D) restrict the take-off to be conducted under VMC;
    - (E) specify the crew qualification, and
    - (F) be limited to aeroplanes where the first type certificate was first issued before 1 January 2005.
  - (iii) The operation must be accepted by the State in which the aerodrome is located.
24. OPS 1.535 Take-off Obstacle Clearance — Multi-Engined aeroplanes:
  - (i) Subparagraphs (a)(3), (a)(4), (a)(5), (b)(2), (c)(1), (c)(2) and the Appendix are not applicable to VFR operations by day.
  - (ii) For IFR or VFR operations by day, subparagraphs (b) and (c) apply with the following variations.
    - (A) Visual course guidance is considered available when the flight visibility is 1 500 m or more
    - (B) The maximum corridor width required is 300 m when flight visibility is 1 500 m or more.

25. OPS 1.545 Landing — destination and alternate aerodromes:

- (i) The paragraph applies with the following addition. Where the requirements of this paragraph cannot be complied with due to physical limitations relating to extending the runway and there is a clear public interest and operational necessity for the operation, the Authority may accept, on a case-by-case basis, other performance data, not conflicting with the Aeroplane Flight Manual relating to special procedures, produced by the operator based on demonstration and/or documented experience.
- (ii) An operator wishing to conduct operations according to subparagraph (I) must have prior approval of the Authority issuing the AOC. Such an approval will:
  - (A) specify the type of aeroplane;
  - (B) specify the type of operation;
  - (C) specify the aerodrome(s) and runways concerned;
  - (D) restrict the final approach and landing to be conducted under VMC;
  - (E) specify the crew qualification, and
  - (F) be limited to aeroplanes where the type certificate was first issued before 1 January 2005.
- (iii) The operation must be accepted by the State in which the aerodrome is located.

26. OPS 1.550 Landing — dry runways:

- (i) The paragraph applies with the following addition. Where the requirements of this paragraph cannot be complied with due to physical limitations relating to extending the runway and there is a clear public interest and operational necessity for the operation, the Authority may accept, on a case-by-case basis, other performance data, not conflicting with the Aeroplane Flight Manual relating to special procedures, produced by the operator based on demonstration and/or documented experience.
- (ii) An operator wishing to conduct operations according to subparagraph (i) must have prior approval of the Authority issuing the AOC. Such an approval will:
  - (A) specify the type of aeroplane;
  - (B) specify the type of operation;
  - (C) specify the aerodrome(s) and runways concerned;
  - (D) restrict the final approach and landing to be conducted under VMC;
  - (E) specify the crew qualification; and
  - (F) be limited to aeroplanes where the first type certificate was issued before 1 January 2005.
- (iii) The operation must be accepted by the State in which the aerodrome is located.

27. Reserved

28. OPS 1.650 Day VFR operations:

Paragraph 1.650 is applicable with the following addition. Single engine aeroplanes, first issued with an individual certificate of airworthiness before 22 May 1995, may be exempted from the requirements of subparagraphs (f), (g), (h) and (i) by the Authority if the fulfilment would require retrofitting.

29. Part M, paragraph M.A.704, Continuing Airworthiness Management Exposition

The Continuing Airworthiness Management Exposition may be adapted to the operation to be conducted;

30. Part M, paragraph M. A. 306, Operator's technical log system:

The Authority may approve an abbreviated form of technical log system, relevant to the type of operation conducted.

31. OPS 1.940 Composition of Flight Crew:

Subparagraphs (a)(2), (a)(4), and (b) are not applicable to VFR operations by day, except that (a)(4) must be applied in full where two pilots are required by OPS 1.

32. OPS 1.945 Conversion training and checking:

(i) Subparagraph (a)(7) — Line flying under supervision (LIFUS) may be performed on any aeroplane within the applicable class. The amount of LIFUS required is dependent on the complexity of the operations to be performed.

(ii) Subparagraph (a)(8) is not required.

33. OPS 1.955 Nomination as commander:

Subparagraph (b) applies as follows. The Authority may accept an abbreviated command course relevant to the type of operation conducted.

34. OPS 1.960 Commanders holding a Commercial Pilot Licence

Subparagraph (a)(1)(i) is not applicable to VFR operations by day.

35. OPS 1.965 Recurrent training and checking:

(i) Subparagraph (a)(1) shall be applied as follows for VFR operations by day. All training and checking shall be relevant to the type of operation and class of aeroplane on which the flight crew member operates with due account taken of any specialised equipment used.

(ii) Subparagraph (a)(3)(ii) applies as follows. Training in the aeroplane may be conducted by a Class Rating Examiner (CRE), a Flight Examiner (FE) or a Type Rating Examiner (TRE).

(iii) Subparagraph (a)(4)(i) applies as follows. Operator proficiency check may be conducted by a Type Rating Examiner (TRE), Class Rating Examiner (CRE) or by a suitably qualified commander nominated by the operator and acceptable to the Authority, trained in CRM concepts and the assessment of CRM skills.

(iv) Subparagraph (b)(2) shall be applicable as follows for VFR operations by day. In those cases where the operations are conducted during seasons not longer than eight consecutive months, one operator proficiency check is sufficient. This proficiency check must be undertaken before commencing commercial air transport operations.

36. OPS 1.968 Pilot qualification for either pilot's seat:

Appendix 1 is not applicable to VFR operations of single engine aeroplanes by day.

37. OPS 1.975 Route and aerodrome competence:

(i) For VFR operations by day, subparagraphs (b), (c) and (d) are not applicable, except that the operator shall ensure that in the cases where a special approval by the state of the aerodrome is required, the associated requirements are observed.

(ii) For IFR operations or VFR operations by night, as an alternative to subparagraphs (b) to (d), route and aerodrome competence may be revalidated as follows:

(A) Except for operations to the most demanding aerodromes, by completion of at least 10 sectors within the area of operation during the preceding 12 months in addition to any required self briefing.

(B) Operations to the most demanding aerodromes may be performed only if:

1. the commander has been qualified at the aerodrome within the preceding 36 months by a visit as an operating flight crew member or as an observer;
2. the approach is performed in VMC from the applicable minimum sector altitude; and
3. an adequate self briefing has been made prior to the flight

38. OPS 1.980 More than one type or variant:

- (i) Not applicable if operations are limited to single pilot classes of piston engine aeroplanes under VFR by day.
- (ii) For IFR and VFR Night Operations, the requirement in Appendix 1 to OPS 1.980, subparagraph (d)(2)(i) for 500 hours in the relevant crew position before exercising the privileges of two licence endorsements, is reduced to 100 hours or sectors if one of the endorsements is related to a class. A check flight must be completed before the pilot is released for duties as Commander.

39. OPS 1.981 Operation of helicopters and aeroplanes:

Subparagraph (a)(1) is not applicable if operations are limited to single pilot classes of piston engine aeroplanes.

40. Reserved

41. OPS 1.1060 Operational flight plan:

Not required for A to A VFR/Day operations. For A to B VFR/Day operations the requirement is applicable but the flight plan may be in a simplified form relevant to the kind of operations conducted. (see OPS 1.135).

42. OPS 1.1070 Continuing Airworthiness Management Exposition

The Continuing Airworthiness Management Exposition may be adapted to the operation to be conducted.

43. OPS 1.1071 Aeroplane technical log:

Applicable as indicated for Part M, paragraph M. A. 306 Operators technical log system.

44. Reserved

45. Reserved

46. OPS 1.1240 Training programmes:

The training programmes shall be adapted to the kind of operations performed. A self-study training programme may be acceptable for VFR operations.

47. OPS 1.1250 Aeroplane search procedure checklist:

Not applicable for VFR operations by day.

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*Appendix 1 to OPS 1.125***Documents to be carried**

See OPS 1.125.

In case of loss or theft of documents specified in OPS 1.125, the operation is allowed to continue until the flight reaches the base or a place where a replacement document can be provided.

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## SUBPART C

## OPERATOR CERTIFICATION AND SUPERVISION

## OPS 1.175

**General rules for air operator certification**

*Note 1:* Appendix 1 to this paragraph specifies the contents and conditions of the AOC.

*Note 2:* Appendix 2 to this paragraph specifies the management and organisation requirements.

- (a) An operator shall not operate an aeroplane for the purpose of commercial air transportation otherwise than under, and in accordance with, the terms and conditions of an Air Operator Certificate (AOC).
- (b) An applicant for an AOC, or variation of an AOC, shall allow the Authority to examine all safety aspects of the proposed operation.
- (c) An applicant for an AOC must:
  - 1. not hold an AOC issued by another Authority unless specifically approved by the Authorities concerned;
  - 2. have his principal place of business and, if any, his registered office located in the State responsible for issuing the AOC;
  - 3. satisfy the Authority that he is able to conduct safe operations.
- (d) If an operator has aeroplanes registered in different Member States, appropriate arrangements shall be made to ensure appropriate safety oversight.
- (e) An operator shall grant the Authority access to his organisation and aeroplanes and shall ensure that, with respect to maintenance, access is granted to any associated Part-145 maintenance organisation, to determine continued compliance with OPS 1.
- (f) An AOC will be varied, suspended or revoked if the Authority is no longer satisfied that the operator can maintain safe operations.
- (g) The operator must satisfy the Authority that:
  - 1. its organisation and management are suitable and properly matched to the scale and scope of the operation; and
  - 2. procedures for the supervision of operations have been defined.
- (h) The operator must have nominated an accountable manager acceptable to the Authority who has corporate authority for ensuring that all operations and maintenance activities can be financed and carried out to the standard required by the Authority.
- (i) The operator must have nominated post holders, acceptable to the Authority, who are responsible for the management and supervision of the following areas:
  - 1. flight operations;
  - 2. the maintenance system;
  - 3. crew training; and
  - 4. ground operations.

- (j) A person may hold more than one of the nominated posts if acceptable to the Authority but, for operators who employ 21 or more full time staff, a minimum of two persons are required to cover the four areas of responsibility.
- (k) For operators who employ 20 or less full time staff, one or more of the nominated posts may be filled by the accountable manager if acceptable to the Authority.
- (l) The operator must ensure that every flight is conducted in accordance with the provisions of the Operations Manual.
- (m) The operator must arrange appropriate ground handling facilities to ensure the safe handling of its flights.
- (n) The operator must ensure that its aeroplanes are equipped and its crews are qualified, as required for the area and type of operation.
- (o) The operator must comply with the maintenance requirements, in accordance with Part M, for all aeroplanes operated under the terms of its AOC.
- (p) The operator must provide the Authority with a copy of the Operations Manual, as specified in Subpart P and all amendments or revisions to it.
- (q) The operator must maintain operational support facilities at the main operating base, appropriate for the area and type of operation.

OPS 1.180

**Issue, variation and continued validity of an AOC**

- (a) An operator will not be granted an AOC, or a variation to an AOC, and that AOC will not remain valid unless:
  - 1. aeroplanes operated have a standard Certificate of Airworthiness issued in accordance with Commission Regulation (EC) No 1702/2003 of 24 September 2003 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations <sup>(1)</sup> by a Member State. Standard Certificates of Airworthiness issued by a Member State other than the State responsible for issuing the AOC, will be accepted without further showing when issued in accordance with Part 21;
  - 2. the maintenance system has been approved by the Authority in accordance with Part M, Subpart G; and
  - 3. he has satisfied the Authority that he has the ability to:
    - (i) Establish and maintain an adequate organisation;
    - (ii) Establish and maintain a quality system in accordance with OPS 1.035;
    - (iii) Comply with required training programmes;
    - (iv) Comply with maintenance requirements, consistent with the nature and extent of the operations specified, including the relevant items prescribed in OPS 1.175 (g) to (o); and
    - (v) Comply with OPS 1.175.
- (b) Notwithstanding the provisions of OPS 1.185 (f), the operator must notify the Authority as soon as practicable of any changes to the information submitted in accordance with OPS 1.185 (a) below.
- (c) If the Authority is not satisfied that the requirements of subparagraph (a) above have been met, the Authority may require the conduct of one or more demonstration flights, operated as if they were commercial air transport flights.

<sup>(1)</sup> OJ L 243, 27.9.2003, p. 6.



## OPS 1.185

**Administrative requirements**

- (a) An operator shall ensure that the following information is included in the initial application for an AOC and, when applicable, any variation or renewal applied for:
1. the official name and business name, address and mailing address of the applicant;
  2. a description of the proposed operation;
  3. a description of the management organisation;
  4. the name of the accountable manager;
  5. the names of major post holders, including those responsible for flight operations, the maintenance system, crew training and ground operations together with their qualifications and experience; and
  6. the Operations Manual.
- (b) In respect of the operator's maintenance system only, the following information must be included in the initial application for an AOC and, when applicable, any variation or renewal applied for, and for each aeroplane type to be operated:
1. the operator's continuing airworthiness management exposition;
  2. the operator's aeroplane maintenance programme(s);
  3. the aeroplane technical log;
  4. where appropriate, the technical specification(s) of the maintenance contract(s) between the operator and any Part-145 approved maintenance organisation;
  5. the number of aeroplanes.
- (c) The application for an initial issue of an AOC must be submitted at least 90 days before the date of intended operation except that the Operations Manual may be submitted later but not less than 60 days before the date of intended operation.
- (d) The application for the variation of an AOC must be submitted at least 30 days, or as otherwise agreed, before the date of intended operation.
- (e) The application for the renewal of an AOC must be submitted at least 30 days, or as otherwise agreed, before the end of the existing period of validity.
- (f) Other than in exceptional circumstances, the Authority must be given at least 10 days prior notice of a proposed change of a nominated post holder.
-

*Appendix 1 to OPS 1.175***Contents and conditions of the Air Operator Certificate**

An AOC specifies the:

- (a) Name and location (principal place of business) of the operator;
  - (b) Date of issue and period of validity;
  - (c) Description of the type of operations authorised;
  - (d) Type(s) of aeroplane(s) authorised for use;
  - (e) Registration markings of the authorised aeroplane(s) except that operators may obtain approval for a system to inform the Authority about the registration markings for aeroplanes operated under its AOC;
  - (f) Authorised areas of operation;
  - (g) Special limitations; and
  - (h) Special authorisations/approvals e.g.:
    - CAT II/CAT III (including approved minima),
    - (MNPS) Minimum navigation performance specifications,
    - (ETOPS) Extended range operation twin engined aeroplanes,
    - (RNAV) Area navigation,
    - (RVSM) Reduced vertical separation minima,
    - Transportation of dangerous goods,
    - Authorisation to provide cabin crew initial safety training and, if applicable, to issue the attestation provided for in Subpart O, for those operators who provide such training directly or indirectly.
-

*Appendix 2 to OPS 1.175***The management and organisation of an AOC holder****(a) General**

An operator must have a sound and effective management structure in order to ensure the safe conduct of air operations. Nominated post holders must have managerial competency together with appropriate technical/operational qualifications in aviation.

**(b) Nominated post holders:**

1. A description of the functions and the responsibilities of the nominated post holders, including their names, must be contained in the Operations Manual and the Authority must be given notice in writing of any intended or actual change in appointments or functions.
2. The operator must make arrangements to ensure continuity of supervision in the absence of nominated post holders.
3. A person nominated as a post holder by the holder of an AOC must not be nominated as a post holder by the holder of any other AOC, unless acceptable to the Authorities concerned.
4. Persons nominated as post holders must be contracted to work sufficient hours to fulfil the management functions associated with the scale and scope of the operation.

**(c) Adequacy and supervision of staff:**

1. Crew members. The operator must employ sufficient flight and cabin crew for the planned operation, trained and checked in accordance with Subpart N and Subpart O as appropriate.
2. Ground Staff
  - (i) The number of ground staff is dependent upon the nature and the scale of operations. Operations and ground handling departments, in particular, must be staffed by trained personnel who have a thorough understanding of their responsibilities within the organisation.
  - (ii) An operator contracting other organisations to provide certain services retains responsibility for the maintenance of proper standards. In such circumstances, a nominated post holder must be given the task of ensuring that any contractor employed meets the required standards.
3. Supervision
  - (i) The number of supervisors to be appointed is dependent upon the structure of the operator and the number of staff employed.
  - (ii) The duties and responsibilities of these supervisors must be defined, and any flying commitments arranged so that they can discharge their supervisory responsibilities.
  - (iii) The supervision of crew members and ground staff must be exercised by individuals possessing experience and personal qualities sufficient to ensure the attainment of the standards specified in the operations manual.

**(d) Accommodation facilities**

1. An operator must ensure that working space available at each operating base is sufficient for personnel pertaining to the safety of flight operations. Consideration must be given to the needs of ground staff, those concerned with operational control, the storage and display of essential records, and flight planning by crews.
2. Office services must be capable, without delay, of distributing operational instructions and other information to all concerned.

**(e) Documentation**

The operator must make arrangements for the production of manuals, amendments and other documentation.

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## SUBPART D

## OPERATIONAL PROCEDURES

## OPS 1.192

**Terminology**

The terms which are listed below are for use within the context of this regulation.

- (a) Adequate Aerodrome. An aerodrome which the operator considers to be satisfactory, taking account of the applicable performance requirements and runway characteristics; at the expected time of use, the aerodrome will be available and equipped with necessary ancillary services such as ATS, sufficient lighting, communications, weather reporting, nav aids and emergency services.
- (b) ETOPS (Extended range operations for two engine aeroplanes). ETOPS operations are those with two engine aeroplanes approved by the Authority (ETOPS approval), to operate beyond the threshold distance determined in accordance with OPS 1.245 (a) from an Adequate Aerodrome.
- (c) Adequate ETOPS en-route alternate aerodrome. An adequate aerodrome, which additionally, at the expected time of use, has an ATS facility and at least one instrument approach procedure.
- (d) En-route alternate (ERA) aerodrome. An adequate aerodrome along the route, which may be required at the planning stage.
- (e) 3 % ERA. An en-route alternate aerodrome selected for the purposes of reducing contingency fuel to 3 %.

- (f) Isolated aerodrome. If acceptable to the Authority, the destination aerodrome can be considered as an isolated aerodrome, if the fuel required (diversion plus final) to the nearest adequate destination alternate aerodrome is more than:

For aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15 % of the flight time planned to be spent at cruising level or two hours, whichever is less; or

For aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel.

- (g) Equivalent position. A position that can be established by means of a DME distance, a suitably located NDB or VOR, SRE or PAR fix or any other suitable fix between three and five miles from threshold that independently establishes the position of the aeroplane.
- (h) Critical phases of flight. Critical phases of flight are the take-off run, the take-off flight path, the final approach, the landing, including the landing roll, and any other phases of flight at the discretion of the commander.
- (i) Contingency fuel. The fuel required to compensate for unforeseen factors 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 and deviations from planned routings and/or cruising levels/altitudes.
- (j) Separate runways. Runways at the same aerodrome that are separate landing surfaces. These runways may overlay or cross in such a way that if one of the runways is blocked, it will not prevent the planned type of operations on the other runway. Each runway shall have a separate approach procedure based on a separate navigation aid.
- (k) Approved one-engine-inoperative cruise speed. For ETOPS, the approved one-engine-inoperative cruise speed for the intended area of operation shall be a speed, within the certified limits of the aeroplane, selected by the operator and approved by the regulatory authority.
- (l) ETOPS area. An ETOPS area is an area containing airspace within which an ETOPS approved aeroplane remains in excess of the specified flying time in still air (in standard conditions) at the approved one-engine-inoperative cruise speed from an adequate ETOPS route alternate aerodrome.
- (m) Dispatch. ETOPS planning minima applies until dispatch. Dispatch is when the aircraft first moves under its own power for the purpose of taking off.

OPS 1.195

**Operational control**

An operator shall:

- (a) Establish and maintain a method of exercising operational control approved by the Authority; and
- (b) Exercise operational control over any flight operated under the terms of his AOC.

OPS 1.200

**Operations manual**

An operator shall provide an Operations Manual in accordance with Subpart P for the use and guidance of operations personnel.

OPS 1.205

**Competence of operations personnel**

An operator shall ensure that all personnel assigned to, or directly involved in, ground and flight operations are properly instructed, have demonstrated their abilities in their particular duties and are aware of their responsibilities and the relationship of such duties to the operation as a whole.

OPS 1.210

**Establishment of procedures**

- (a) An operator shall establish procedures and instructions, for each aeroplane type, containing ground staff and crew members' duties for all types of operation on the ground and in flight.
- (b) An operator shall establish a check-list system to be used by crew members for all phases of operation of the aeroplane under normal, abnormal and emergency conditions as applicable, to ensure that the operating procedures in the Operations Manual are followed.
- (c) An operator shall not require a crew member to perform any activities during critical phases of the flight other than those required for the safe operation of the aeroplane (see OPS 1.192).

OPS 1.215

**Use of air traffic services**

An operator shall ensure that air traffic services are used for all flights whenever available.

OPS 1.216

**In-flight operational instructions**

An operator shall ensure that his in-flight operational instructions involving a change to the air traffic flight plan shall, when practicable, be coordinated with the appropriate air traffic service unit before transmission to an aeroplane.

OPS 1.220

**Authorisation of aerodromes by the operator**

(See OPS 1.192)

An operator shall only authorise use of aerodromes that are adequate for the type(s) of aeroplane and operation(s) concerned.

## OPS 1.225

**Aerodrome operating minima**

- (a) An operator shall specify aerodrome operating minima, established in accordance with OPS 1.430 for each departure, destination or alternate aerodrome authorised to be used in accordance with OPS 1.220.
- (b) Any increment imposed by the Authority must be added to the minima specified in accordance with subparagraph (a) above.
- (c) The minima for a specific type of approach and landing procedure are considered applicable if:
  - 1. The ground equipment shown on the respective chart required for the intended procedure is operative;
  - 2. The aeroplane systems required for the type of approach are operative;
  - 3. The required aeroplane performance criteria are met; and
  - 4. Crew is qualified accordingly.

## OPS 1.230

**Instrument departure and approach procedures**

- (a) An operator shall ensure that instrument departure and approach procedures established by the State in which the aerodrome is located are used.
- (b) Notwithstanding subparagraph (a) above, a commander may accept an ATC clearance to deviate from a published departure or arrival route, provided obstacle clearance criteria are observed and full account is taken of the operating conditions. The final approach must be flown visually or in accordance with the established instrument approach procedure.
- (c) Different procedures to those required to be used in accordance with subparagraph (a) above may only be implemented by an operator provided they have been approved by the State in which the aerodrome is located, if required, and accepted by the Authority.

## OPS 1.235

**Noise abatement procedures**

(See OPS 1.192)

An operator shall establish appropriate operating departure and arrival/approach procedures for each aircraft type in accordance with the following:

- (a) The operator shall ensure that safety has priority over noise abatement, and
- (b) These procedures shall be designed to be simple and safe to operate with no significant increase in crew workload during critical phases of flight, and
- (c) For each aeroplane type two departure procedures shall be defined, in accordance with ICAO Doc. 8168 (Procedures for air navigation services, "PANS-OPS"), Volume I:
  - 1. noise abatement departure procedure one (NADP 1), designed to meet the close-in noise abatement objective; and
  - 2. noise abatement departure procedure two (NADP 2), designed to meet the distant noise abatement objective; and
  - 3. in addition, each NADP climb profile can only have one sequence of actions.

## OPS 1.240

**Routes and areas of operation**

- (a) An operator shall ensure that operations are only conducted along such routes or within such areas, for which:
1. Ground facilities and services, including meteorological services, are provided which are adequate for the planned operation;
  2. The performance of the aeroplane intended to be used is adequate to comply with minimum flight altitude requirements;
  3. The equipment of the aeroplane intended to be used meets the minimum requirements for the planned operation;
  4. Appropriate maps and charts are available (OPS 1.135 (a)(9) refers);
  5. If two-engined aeroplanes are used, adequate aerodromes are available within the time/distance limitations of OPS 1.245;
  6. If single-engine aeroplanes are used, surfaces are available which permit a safe forced landing to be executed.
- (b) An operator shall ensure that operations are conducted in accordance with any restriction on the routes or the areas of operation, imposed by the Authority.

## OPS 1.241

**Operation in defined airspace with reduced vertical separation minima (RVSM)**

An operator shall not operate an aeroplane in defined portions of airspace where, based on regional air navigation agreement, a vertical separation minimum of 300 m (1 000 ft) applies unless approved to do so by the Authority (RVSM Approval). (See also OPS 1.872).

## OPS 1.243

**Operation in areas with specified navigation performance requirements**

- (a) An operator shall ensure that an aeroplane operated in areas, or through portions of airspace, or on routes where navigation performance requirements have been specified, is certified according to these requirements, and, if required, that the Authority has granted the relevant operational approval. (See also OPS 1.865 (c)(2), OPS 1.870 and OPS 1.872).
- (b) An operator of an aeroplane operating in areas referred to in (a) shall ensure that all contingency procedures, specified by the authority responsible for the airspace concerned, have been included in the Operations Manual.

## OPS 1.245

**Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval**

(See OPS 1.192)

- (a) Unless specifically approved by the Authority in accordance with OPS 1.246 (a) (ETOPS approval), an operator shall not operate a two-engined aeroplane over a route which contains a point further from an adequate aerodrome (under standard conditions in still air) than, in the case of:
1. Performance Class A aeroplanes with either:
    - (i) a maximum approved passenger seating configuration of 20 or more; or
    - (ii) a maximum take-off mass of 45 360 kg or more,
- the distance flown in 60 minutes at the one-engine-inoperative cruise speed determined in accordance with subparagraph (b) below;

2. Performance Class A aeroplanes with:

- (i) a maximum approved passenger seating configuration of 19 or less; and
- (ii) a maximum take-off mass less than 45 360 kg,

the distance flown in 120 minutes or, if approved by the Authority, up to 180 minutes for turbo-jet aeroplanes, at the one-engine-inoperative cruise speed determined in accordance with subparagraph (b) below;

3. Performance Class B or C aeroplanes:

- (i) The distance flown in 120 minutes at the one-engine-inoperative cruise speed determined in accordance with subparagraph (b) below; or
  - (ii) 300 nautical miles, whichever is less.
- (b) An operator shall determine a speed for the calculation of the maximum distance to an adequate aerodrome for each two-engined aeroplane type or variant operated, not exceeding VMO, based upon the true airspeed that the aeroplane can maintain with one-engine-inoperative.
- (c) An operator must ensure that the following data, specific to each type or variant, is included in the Operations Manual:
- 1. the one-engine-inoperative cruise speed determined in accordance with subparagraph (b) above; and
  - 2. the maximum distance from an adequate aerodrome determined in accordance with subparagraphs (a) and (b) above.

*Note:* The speeds specified above are only intended to be used for establishing the maximum distance from an adequate aerodrome.

OPS 1.246

**Extended range operations with two-engined aeroplanes (ETOPS)**

(See OPS 1.192)

- (a) An operator shall not conduct operations beyond the threshold distance determined in accordance with OPS 1.245 unless approved to do so by the Authority (ETOPS approval).
- (b) Prior to conducting an ETOPS flight, an operator shall ensure that an adequate ETOPS en-route alternate is available, within either the operator's approved diversion time, or a diversion time based on the MEL generated serviceability status of the aeroplane, whichever is shorter. (See also OPS 1.297 (d)).

OPS 1.250

**Establishment of minimum flight altitudes**

- (a) An operator shall establish minimum flight altitudes and the methods to determine those altitudes for all route segments to be flown which provide the required terrain clearance taking into account the requirements of Subparts F to I.
- (b) Every method for establishing minimum flight altitudes must be approved by the Authority.
- (c) Where minimum flight altitudes established by States overflown are higher than those established by the operator, the higher values shall apply.
- (d) An operator shall take into account the following factors when establishing minimum flight altitudes:
  - 1. The accuracy with which the position of the aeroplane can be determined;



2. The probable inaccuracies in the indications of the altimeters used;
  3. The characteristics of the terrain (e.g. sudden changes in the elevation) along the routes or in the areas where operations are to be conducted;
  4. The probability of encountering unfavourable meteorological conditions (e.g. severe turbulence and descending air currents); and
  5. Possible inaccuracies in aeronautical charts.
- (e) In fulfilling the requirements prescribed in subparagraph (d) above due consideration shall be given to:
1. Corrections for temperature and pressure variations from standard values;
  2. The ATC requirements; and
  3. Any foreseeable contingencies along the planned route.

OPS 1.255

**Fuel policy**

(See Appendix 1 and Appendix 2 to OPS 1.255)

- (a) An operator must establish a fuel policy for the purpose of flight planning and in-flight re-planning to ensure that every flight carries sufficient fuel for the planned operation and reserves to cover deviations from the planned operation.
- (b) An operator shall ensure that the planning of flights is at least based upon 1. and 2. below:
1. Procedures contained in the Operations Manual and data derived from:
    - (i) data provided by the aeroplane manufacturer; or
    - (ii) current aeroplane specific data derived from a fuel consumption monitoring system.
  2. The operating conditions under which the flight is to be conducted including:
    - (i) realistic aeroplane fuel consumption data;
    - (ii) anticipated masses;
    - (iii) expected meteorological conditions; and
    - (iv) air navigation services provider(s) procedures and restrictions.
- (c) An operator shall ensure that the pre-flight calculation of usable fuel required for a flight includes:
1. Taxi fuel; and
  2. Trip fuel; and
  3. Reserve fuel consisting of:
    - (i) contingency fuel (see OPS 1.192); and
    - (ii) alternate fuel, if a destination alternate aerodrome is required. (This does not preclude selection of the departure aerodrome as the destination alternate aerodrome); and
    - (iii) final reserve fuel; and
    - (iv) additional fuel, if required by the type of operation (e.g. ETOPS); and
  4. extra fuel if required by the commander.

- (d) An operator shall ensure that in-flight re-planning procedures for calculating usable fuel required when a flight has to proceed along a route or to a destination aerodrome other than originally planned includes:
1. trip fuel for the remainder of the flight; and
  2. reserve fuel consisting of:
    - (i) contingency fuel; and
    - (ii) alternate fuel, if a destination alternate aerodrome is required (this does not preclude selection of the departure aerodrome as the destination alternate aerodrome); and
    - (iii) final reserve fuel; and
    - (iv) additional fuel, if required by the type of operation (e.g. ETOPS); and
  3. extra fuel if required by the commander.

*OPS 1.260*

**Carriage of persons with reduced mobility**

- (a) An operator shall establish procedures for the carriage of persons with reduced mobility (PRMs).
- (b) An operator shall ensure that PRMs are not allocated, nor occupy, seats where their presence could:
1. impede the crew in their duties;
  2. obstruct access to emergency equipment; or
  3. impede the emergency evacuation of the aeroplane.
- (c) The commander must be notified when PRMs are to be carried on board.

*OPS 1.265*

**Carriage of inadmissible passengers, deportees or persons in custody**

An operator shall establish procedures for the transportation of inadmissible passengers, deportees or persons in custody to ensure the safety of the aeroplane and its occupants. The commander must be notified when the above-mentioned persons are to be carried on board.

*OPS 1.270*

**Stowage of baggage and cargo**

(See Appendix 1 to OPS 1.270)

- (a) An operator shall establish procedures to ensure that only such hand baggage is taken into the passenger cabin as can be adequately and securely stowed.
- (b) An operator shall establish procedures to ensure that all baggage and cargo on board, which might cause injury or damage, or obstruct aisles and exits if displaced, is placed in stowages designed to prevent movement.

OPS 1.275

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OPS 1.280

#### **Passenger seating**

An operator shall establish procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the aeroplane.

OPS 1.285

#### **Passenger briefing**

An operator shall ensure that:

(a) General

1. Passengers are given a verbal briefing about safety matters. Parts or all of the briefing may be provided by an audio-visual presentation.
2. Passengers are provided with a safety briefing card on which picture type instructions indicate the operation of emergency equipment and exits likely to be used by passengers.

(b) Before take-off

1. Passengers are briefed on the following items if applicable:
  - (i) smoking regulations;
  - (ii) back of the seat to be in the upright position and tray table stowed;
  - (iii) location of emergency exits;
  - (iv) location and use of floor proximity escape path markings;
  - (v) stowage of hand baggage;
  - (vi) restrictions on the use of portable electronic devices; and
  - (vii) the location and the contents of the safety briefing card; and,
2. Passengers receive a demonstration of the following:
  - (i) the use of safety belts and/or safety harnesses, including how to fasten and unfasten the safety belts and/or safety harnesses;
  - (ii) the location and use of oxygen equipment if required (OPS 1.770 and OPS 1.775 refer). Passengers must also be briefed to extinguish all smoking materials when oxygen is being used; and
  - (iii) the location and use of life jackets if required (OPS 1.825 refers).

(c) After take-off

1. Passengers are reminded of the following if applicable:
  - (i) smoking regulations; and
  - (ii) use of safety belts and/or safety harnesses including the safety benefits of having safety belts fastened when seated irrespective of seat belt sign illumination.

- (d) Before landing
  - 1. Passengers are reminded of the following if applicable:
    - (i) smoking regulations;
    - (ii) use of safety belts and/or safety harnesses;
    - (iii) back of the seat to be in the upright position and tray table stowed;
    - (iv) re-stowage of hand baggage; and
    - (v) restrictions on the use of portable electronic devices.
- (e) After landing
  - 1. Passengers are reminded of the following:
    - (i) smoking regulations; and
    - (ii) use of safety belts and/or safety harnesses.
- (f) In an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

OPS 1.290

**Flight preparation**

- (a) An operator shall ensure that an operational flight plan is completed for each intended flight.
- (b) The commander shall not commence a flight unless he/she is satisfied that:
  - 1. the aeroplane is airworthy;
  - 2. the aeroplane is not operated contrary to the provision of the configuration deviation list (CDL);
  - 3. the instruments and equipment required for the flight to be conducted, in accordance with Subparts K and L, are available;
  - 4. the instruments and equipment are in operable condition except as provided in the MEL;
  - 5. those parts of the operations manual which are required for the conduct of the flight are available;
  - 6. the documents, additional information and forms required to be available by OPS 1.125 and OPS 1.135 are on board;
  - 7. current maps, charts and associated documentation or equivalent data are available to cover the intended operation of the aeroplane including any diversion which may reasonably be expected. This shall include any conversion tables necessary to support operations where metric heights, altitudes and flight levels must be used;
  - 8. ground facilities and services required for the planned flight are available and adequate;
  - 9. the provisions specified in the operations manual in respect of fuel, oil and oxygen requirements, minimum safe altitudes, aerodrome operating minima and availability of alternate aerodromes, where required, can be complied with for the planned flight;
  - 10. the load is properly distributed and safely secured;
  - 11. the mass of the aeroplane, at the commencement of take-off roll, will be such that the flight can be conducted in compliance with Subparts F to I as applicable; and
  - 12. any operational limitation in addition to those covered by subparagraphs 9 and 11 above can be complied with.

## OPS 1.295

**Selection of aerodromes**

- (a) An operator shall establish procedures for the selection of destination and/or alternate aerodromes in accordance with OPS 1.220 when planning a flight.
- (b) An operator must select and specify in the operational flight plan a take-off alternate aerodrome if it would not be possible to return to the departure aerodrome for meteorological or performance reasons. The take-off alternate aerodrome, in relation to the departure aerodrome, shall be located within:
  - 1. for two-engined aeroplanes, either:
    - (i) one hour flight time at a one-engine-inoperative cruising speed according to the Aircraft Flight Manual (AFM) in still air standard conditions based on the actual take-off mass; or
    - (ii) the operator's approved ETOPS diversion time, subject to any MEL restriction, up to a maximum of two hours, at the one-engine-inoperative cruising speed according to the AFM in still air standard conditions based on the actual take-off mass for aeroplanes and crews authorised for ETOPS; or
  - 2. two hours flight time at a one-engine-inoperative cruising speed according to the AFM in still air standard conditions based on the actual take-off mass for three and four-engined aeroplanes; and
  - 3. if the AFM does not contain a one-engine-inoperative cruising speed, the speed to be used for calculation must be that which is achieved with the remaining engine(s) set at maximum continuous power.
- (c) An operator must select at least one destination alternate for each IFR flight unless:
  - 1. both:
    - (i) the duration of the planned flight from take-off to landing or, in the event of in-flight re-planning in accordance with OPS 1.255(d), the remaining flying time to destination does not exceed six hours, and
    - (ii) two separate runways (see OPS 1.192) are available and usable at the destination aerodrome and the appropriate weather reports or forecasts for the destination aerodrome, or any combination thereof, indicate that for the period from one hour before until one hour after the expected time of arrival at the destination aerodrome, the ceiling will be at least 2 000 ft or circling height + 500 ft, whichever is greater, and the visibility will be at least 5 km;
  - or
  - 2. the destination aerodrome is isolated.
- (d) An operator must select two destination alternate aerodromes when:
  - 1. the appropriate weather reports or forecasts for the destination aerodrome, or any combination thereof, indicate that during a period commencing one hour before and ending one hour after the estimated time of arrival, the weather conditions will be below the applicable planning minima (see OPS 1.297(b)); or
  - 2. no meteorological information is available.
- (e) An operator shall specify any required alternate aerodrome(s) in the operational flight plan.

## OPS 1.297

**Planning minima for IFR flights**

- (a) Planning minima for a take-off alternate aerodrome. An operator shall only select an aerodrome as a take-off alternate aerodrome when the appropriate weather reports or forecasts or any combination thereof indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the applicable landing minima specified in accordance with OPS 1.225. The ceiling must be taken into account when the only approaches available are non-precision and/or circling approaches. Any limitation related to one-engine-inoperative operations must be taken into account.
- (b) Planning minima for a destination aerodrome (except isolated destination aerodromes). An operator shall only select the destination aerodrome and when:
1. the appropriate weather reports or forecasts, or any combination thereof, indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the applicable planning minima as follows:
    - (i) RVR/visibility specified in accordance with OPS 1.225; and
    - (ii) For a non-precision approach or a circling approach, the ceiling at or above MDH; or
  2. two destination alternate aerodromes are selected under OPS 1.295(d).
- (c) Planning minima for a:
- destination alternate aerodrome, or
- isolated aerodrome, or
- 3 % ERA aerodrome, or
- en-route alternate aerodrome required at the planning stage

An operator shall only select an aerodrome for one of those purposes when the appropriate weather reports or forecasts, or any combination thereof, indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome, the weather conditions will be at or above the planning minima in Table 1 below.

Table 1

**Planning minima — Destination alternate aerodrome, isolated destination aerodrome, 3 % ERA and en-route alternate aerodrome**

Type of approach	Planning minima
Cat II and III	Cat I ( <i>Note 1</i> )
Cat I	Non-precision ( <i>Notes 1 and 2</i> )
Non-precision	Non-precision ( <i>Notes 1 and 2</i> ) plus 200 ft / 1 000 m
Circling	Circling

*Note 1* RVR.

*Note 2* The ceiling must be at or above the MDH.

- (d) Planning minima for an ETOPS en-route alternate aerodrome. An operator shall only select an aerodrome as an ETOPS en-route alternate aerodrome when the appropriate weather reports or forecasts, or any combination thereof, indicate that, between the anticipated time of landing until one hour after the latest possible time of landing, conditions calculated by adding the additional limits of Table 2 will exist. An operator shall include in the Operations Manual the method for determining the operating minima at the planned ETOPS en-route alternate aerodrome.

Table 2

**Planning minima — ETOPS**

Approach facility	Alternate airfield ceiling	Weather minima Visibility/RVR
Precision approach procedure.	Authorised DH/DA plus an increment of 200 ft	Authorised visibility plus an increment of 800 metres
Non-precision approach or circling approach	Authorised MDH/MDA plus an increment of 400 ft	Authorised visibility plus an increment of 1 500 metres

## OPS 1.300

**Submission of ATS flight plan**

An operator shall ensure that a flight is not commenced unless an ATS flight plan has been submitted, or adequate information has been deposited in order to permit alerting services to be activated if required.

## OPS 1.305

**Refuelling/defuelling with passengers embarking, on board or disembarking**

(See Appendix 1 to OPS 1.305)

An operator shall ensure that no aeroplane is refuelled/defuelled with Avgas or wide cut type fuel (e.g. Jet-B or equivalent) or when a mixture of these types of fuel might occur, when passengers are embarking, on board or disembarking. In all other cases necessary precautions must be taken and the aeroplane must be properly manned by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

## OPS 1.307

**Refuelling/defuelling with wide-cut fuel**

An operator shall establish procedures for refuelling/defuelling with wide-cut fuel (e.g. Jet-B or equivalent) if this is required.

## OPS 1.308

**Push back and towing**

- (a) The operator shall ensure that all push back and towing procedures comply with appropriate aviation standards and procedures.
- (b) The operator shall ensure that pre- or post-taxi positioning of the aeroplanes is not executed by towbarless towing unless:
  - 1. an aeroplane is protected by its own design from damage to the nose wheel steering system due to towbarless towing operation, or
  - 2. a system/procedure is provided to alert the flight crew that such damage may have or has occurred, or
  - 3. the towbarless towing vehicle is designed to prevent damage to the aeroplane type.

## OPS 1.310

**Crew members at stations**

- (a) Flight crew members
1. During take-off and landing each flight crew member required to be on flight deck duty shall be at his/her station.
  2. During all other phases of flight each flight crew member required to be on flight deck duty shall remain at his/her station unless his/her absence is necessary for the performance of his/her duties in connection with the operation, or for physiological needs provided at least one suitably qualified pilot remains at the controls of the aeroplane at all times.
  3. During all phases of flight each flight crew member required to be on flight deck duty shall remain alert. If a lack of alertness is encountered, appropriate countermeasures shall be used. If unexpected fatigue is experienced a controlled rest procedure, organised by the commander, can be used if workload permits. Controlled rest taken in this way may never be considered to be part of a rest period for purposes of calculating flight time limitations nor used to justify any duty period.
- (b) Cabin crew members. On all the decks of the aeroplane that are occupied by passengers, required cabin crew members shall be seated at their assigned stations during critical phases of flight.

## OPS 1.311

**Minimum number of cabin crew required to be on board an aeroplane during ground operations with passengers**

(see Appendix 1 to OPS 1.311)

An operator shall ensure that, whenever any passengers are on board an aeroplane, the minimum number of cabin crew required in accordance with OPS 1.990(a), (b), (c) and (d) are present in the passenger cabin, except:

- (a) When the aeroplane is on the ground at a parking place, the number of cabin crew present in the passenger cabin may be reduced below the number determined by OPS 1.990(a), (b) and (c). The minimum number of cabin crew required in these circumstances shall be one per pair of floor-level emergency exits on each passenger deck, or one for every 50, or fraction of 50, passengers present on board, whichever is greater, provided that:
1. the operator has established a procedure for the evacuation of passengers with this reduced number of cabin crew that has been accepted by the Authority as providing equivalent safety; and
  2. no refuelling/defuelling is taking place; and
  3. the senior cabin crew member has performed the pre-boarding safety briefing to the Cabin Crew; and
  4. the senior cabin crew member is present in the passenger cabin; and
  5. the pre-boarding cabin checks have been completed.

This reduction is not permitted when the number of cabin crew is determined by using OPS 1.990(d).

- (b) During disembarkation when the number of passengers remaining on board is less than 20, the minimum number of cabin crew present in the passenger cabin may be reduced below the minimum number of cabin crew required in accordance with OPS 1.990(a), (b), (c) and (d), provided that:
1. the operator has established a procedure for the evacuation of passengers with this reduced number of cabin crew that has been accepted by the Authority as providing equivalent safety; and
  2. the senior cabin crew member is present in the passenger cabin.



## OPS 1.313

**Use of headset**

- (a) Each flight crew member required to be on flight deck duty shall wear the headset with boom microphone or equivalent required by OPS 1.650(p) and/or 1.652(s) and use it as the primary device to listen to the voice communications with air traffic services:
- on the ground:
  - when receiving the ATC departure clearance via voice communication,
  - when engines are running,
  - in flight below transition altitude or 10 000 feet, whichever is higher, and
  - whenever deemed necessary by the commander.
- (b) In the conditions of paragraph 1 above, the boom microphone or equivalent shall be in a position which permits its use for two-way radio communications.

## OPS 1.315

**Assisting means for emergency evacuation**

An operator shall establish procedures to ensure that before taxiing, take-off and landing, and when safe and practicable to do so, an assisting means for emergency evacuation that deploys automatically, is armed.

## OPS 1.320

**Seats, safety belts and harnesses**

- (a) Crew members
1. During take-off and landing, and whenever deemed necessary by the commander in the interest of safety, each crew member shall be properly secured by all safety belts and harnesses provided.
  2. During other phases of the flight each flight crew member on the flight deck shall keep his/her safety belt fastened while at his/her station.
- (b) Passengers
1. Before take-off and landing, and during taxiing, and whenever deemed necessary in the interest of safety, the commander shall ensure that each passenger on board occupies a seat or berth with his/her safety belt, or harness where provided, properly secured.
  2. An operator shall make provision for, and the commander shall ensure that multiple occupancy of aeroplane seats may only be allowed on specified seats and does not occur other than by one adult and one infant who is properly secured by a supplementary loop belt or other restraint device.

## OPS 1.325

**Securing of passenger cabin and galley(s)**

- (a) An operator shall establish procedures to ensure that before taxiing, take-off and landing all exits and escape paths are unobstructed.
- (b) The commander shall ensure that before take-off and landing, and whenever deemed necessary in the interest of safety, all equipment and baggage is properly secured.

## OPS 1.330

**Accessibility of emergency equipment**

The commander shall ensure that relevant emergency equipment remains easily accessible for immediate use.

## OPS 1.335

**Smoking on board**

- (a) The commander shall ensure that no person on board is allowed to smoke:
1. whenever deemed necessary in the interest of safety;
  2. while the aeroplane is on the ground unless specifically permitted in accordance with procedures defined in the Operations Manual;
  3. outside designated smoking areas, in the aisle(s) and in the toilet(s);
  4. in cargo compartments and/or other areas where cargo is carried which is not stored in flame resistant containers or covered by flame resistant canvas; and
  5. in those areas of the cabin where oxygen is being supplied.

## OPS 1.340

**Meteorological conditions**

- (a) On an IFR flight a commander shall only:
1. commence take-off; or
  2. continue beyond the point from which a revised flight plan applies in the event of in-flight re-planning, when information is available indicating that the expected weather conditions, at the time of arrival, at the destination and/or required alternate aerodrome(s) prescribed in OPS 1.295 are at or above the planning minima, prescribed in OPS 1.297.
- (b) On an IFR flight, a commander shall only continue towards the planned destination aerodrome when the latest information available indicates that, at the expected time of arrival, the weather conditions at the destination, or at least one destination alternate aerodrome, are at or above the planning applicable aerodrome operating minima.
- (c) On an IFR flight a commander shall only continue beyond:
1. the decision point when using the reduced contingency fuel procedure (see Appendix 1 to OPS 1.255); or
  2. the pre-determined point when using the pre-determined point procedure (see Appendix 1 to OPS 1.255),
- when information is available indicating that the expected weather conditions, at the time of arrival, at the destination and/or required alternate aerodrome(s) prescribed in OPS 1.295 are at or above the applicable aerodrome operating minima prescribed in OPS 1.225.
- (d) On a VFR flight a commander shall only commence take-off when the appropriate weather reports or forecasts, or any combination thereof, indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to render compliance with these rules possible.

## OPS 1.345

**Ice and other contaminants — ground procedures**

- (a) An operator shall establish procedures to be followed when ground de-icing and anti-icing and related inspections of the aeroplane(s) are necessary.
- (b) A commander shall not commence take-off unless the external surfaces are clear of any deposit which might adversely affect the performance and/or controllability of the aeroplane except as permitted in the Aeroplane Flight Manual.

## OPS 1.346

**Ice and other contaminants — flight procedures**

- (a) An operator shall establish procedures for flights in expected or actual icing conditions.
- (b) A commander shall not commence a flight nor intentionally fly into expected or actual icing conditions unless the aeroplane is certificated and equipped to cope with such conditions.

## OPS 1.350

**Fuel and oil supply**

A commander shall only commence a flight or continue in the event of in-flight re-planning when he/she is satisfied that the aeroplane carries at least the planned amount of usable fuel and oil to complete the flight safely, taking into account the expected operating conditions.

## OPS 1.355

**Take-off conditions**

Before commencing take-off, a commander must satisfy himself/herself that, according to the information available to him/her, the weather at the aerodrome and the condition of the runway intended to be used should not prevent a safe take-off and departure.

## OPS 1.360

**Application of take-off minima**

Before commencing take-off, a commander must satisfy himself/herself that the RVR or visibility in the take-off direction of the aeroplane is equal to or better than the applicable minimum.

## OPS 1.365

**Minimum flight altitudes**

The commander or the pilot to whom conduct of the flight has been delegated shall not fly below specified minimum altitudes except when necessary for take-off or landing.

## OPS 1.370

**Simulated abnormal situations in flight**

An operator shall establish procedures to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means are not simulated during commercial air transportation flights.

## OPS 1.375

**In-flight fuel management**

An operator shall establish a procedure to ensure that in-flight fuel checks and fuel management are carried out according to the following criteria:

- (a) in-flight fuel checks.
  - 1. a commander must ensure that fuel checks are carried out in-flight at regular intervals. The usable remaining fuel must be recorded and evaluated to:
    - (i) compare actual consumption with planned consumption;
    - (ii) check that the usable remaining fuel is sufficient to complete the flight, in accordance with paragraph (b) "In-flight fuel management" below; and
    - (iii) determine the expected usable fuel remaining on arrival at the destination aerodrome;
  - 2. the relevant fuel data must be recorded.
- (b) in-flight fuel management.
  - 1. the flight must be conducted so that the expected usable fuel remaining on arrival at the destination aerodrome is not less than:
    - (i) the required alternate fuel plus final reserve fuel, or
    - (ii) the final reserve fuel if no alternate aerodrome is required;
  - 2. however, if, as a result of an in-flight fuel check, the expected usable fuel remaining on arrival at the destination aerodrome is less than:
    - (i) the required alternate fuel plus final reserve fuel, the commander must take into account the traffic and the operational conditions prevailing at the destination aerodrome, at the destination alternate aerodrome and at any other adequate aerodrome, in deciding whether to proceed to the destination aerodrome or to divert so as to perform a safe landing with not less than final reserve fuel, or
    - (ii) the final reserve fuel if no alternate aerodrome is required, the commander must take appropriate action and proceed to an adequate aerodrome so as to perform a safe landing with not less than final reserve fuel;
  - 3. the commander shall declare an emergency when calculated usable fuel on landing, at the nearest adequate aerodrome where a safe landing can be performed, is less than final reserve fuel.
  - 4. additional conditions for specific procedures.
    - (i) On a flight using the RCF procedure, in order to proceed to the Destination 1 aerodrome, the commander must ensure that the usable fuel remaining at the decision point is at least the total of:
      - trip fuel from the decision point to the Destination 1 aerodrome; and
      - contingency fuel equal to 5 % of trip fuel from the decision point to the Destination 1 aerodrome; and
      - destination 1 aerodrome alternate fuel, if a destination 1 alternate aerodrome is required; and
      - Final reserve fuel

- (ii) On a flight using the PDP procedure in order to proceed to the destination aerodrome, the commander must ensure that the usable fuel remaining at the PDP is at least the total of:

Trip fuel from the PDP to the destination aerodrome; and

contingency fuel from the PDP to the destination aerodrome calculated in accordance with Appendix 1 to OPS 1.255 Paragraph 1.3; and

fuel required according to Appendix 1 to OPS 1.255 Paragraph 3.1.d

OPS 1.380

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OPS 1.385

#### **Use of supplemental oxygen**

A commander shall ensure that flight crew members engaged in performing duties essential to the safe operation of an aeroplane in flight use supplemental oxygen continuously whenever cabin altitude exceeds 10 000 ft for a period in excess of 30 minutes and whenever the cabin altitude exceeds 13 000 ft.

OPS 1.390

#### **Cosmic radiation**

- (a) An operator shall take account of the in-flight exposure to cosmic radiation of all crew members while on duty (including positioning) and shall take the following measures for those crew liable to be subject to exposure of more than 1 mSv per year:
1. assess their exposure;
  2. take into account the assessed exposure when organising working schedules with a view to reduce the doses of highly exposed crew members;
  3. inform the crew members concerned of the health risks their work involves;
  4. ensure that the working schedules for female crew members, once they have notified the operator that they are pregnant, keep the equivalent dose to the foetus as low as can reasonably be achieved and in any case ensure that the dose does not exceed 1 mSv for the remainder of the pregnancy;
  5. ensure that individual records are kept for those crew members who are liable to high exposure. These exposures are to be notified to the individual on an annual basis, and also upon leaving the operator.
- (b) 1. an operator shall not operate an aeroplane above 15 000 m (49 000 ft) unless the equipment specified in OPS 1.680(a)(1) is serviceable, or the procedure prescribed in OPS 1.680(a)(2) is complied with.
2. the commander or the pilot to whom conduct of the flight has been delegated shall initiate a descent as soon as practicable when the limit values of cosmic radiation dose rate specified in the Operations Manual are exceeded.

OPS 1.395

#### **Ground proximity detection**

When undue proximity to the ground is detected by any flight crew member or by a ground proximity warning system, the commander or the pilot to whom conduct of the flight has been delegated shall ensure that corrective action is initiated immediately to establish safe flight conditions.

## OPS 1.398

**Use of airborne collision avoidance system (ACAS)**

An operator shall establish procedures to ensure that:

- (a) when ACAS is installed and serviceable, it shall be used in flight in a mode that enables resolution advisories (RA) to be produced unless to do so would not be appropriate for conditions existing at the time.
- (b) when undue proximity to another aircraft (RA) is detected by ACAS, the commander or the pilot to whom conduct of the flight has been delegated must ensure that any corrective action indicated by the RA is initiated immediately, unless doing so would jeopardise the safety of the aeroplane.

The corrective action must:

- (i) never be in a sense opposite to that indicated by the RA;
  - (ii) be in the correct sense indicated by the RA even if this is in conflict with the vertical element of an ATC instruction;
  - (iii) be the minimum possible to comply with the RA indication.
- (c) prescribed ACAS ATC communications are specified.
  - (d) when the conflict is resolved the aeroplane is promptly returned to the terms of the ATC instructions or clearance.

## OPS 1.400

**Approach and landing conditions**

Before commencing an approach to land, the commander must satisfy himself/herself that, according to the information available to him/her, the weather at the aerodrome and the condition of the runway intended to be used should not prevent a safe approach, landing or missed approach, having regard to the performance information contained in the Operations Manual.

## OPS 1.405

**Commencement and continuation of approach**

- (a) The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported RVR/Visibility but the approach shall not be continued beyond the outer marker, or equivalent position, if the reported RVR/visibility is less than the applicable minima (see OPS 1.192).
- (b) Where RVR is not available, RVR values may be derived by converting the reported visibility in accordance with Appendix 1 to OPS 1.430, subparagraph (h).
- (c) If, after passing the outer marker or equivalent position in accordance with (a) above, the reported RVR/visibility falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.
- (d) Where no outer marker or equivalent position exists, the commander or the pilot to whom conduct of the flight has been delegated shall make the decision to continue or abandon the approach before descending below 1 000 ft above the aerodrome on the final approach segment. If the MDA/H is at or above 1 000 ft above the aerodrome, the operator shall establish a height, for each approach procedure, below which the approach shall not be continued if RVR/visibility is less than applicable minima.
- (e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the required visual reference is established at the DA/H or MDA/H and is maintained.

- (f) The touch-down zone RVR is always controlling. If reported and relevant, the mid point and stop end RVR are also controlling. The minimum RVR value for the mid-point is 125 m or the RVR required for the touch-down zone if less, and 75 m for the stop-end. For aeroplanes equipped with a roll-out guidance or control system, the minimum RVR value for the mid-point is 75 m.

Note: "Relevant", in this context, means that part of the runway used during the high speed phase of the landing down to a speed of approximately 60 knots.

#### OPS 1.410

### Operating procedures — Threshold crossing height

An operator must establish operational procedures designed to ensure that an aeroplane being used to conduct precision approaches crosses the threshold by a safe margin, with the aeroplane in the landing configuration and attitude.

#### OPS 1.415

### Journey log

A commander shall ensure that the journey log is completed.

#### OPS 1.420

### Occurrence reporting

#### (a) Terminology

1. "Incident". An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
2. "Serious Incident". An incident involving circumstances indicating that an accident nearly occurred.
3. "Accident". An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all persons have disembarked, in which:

- (i) a person is fatally or seriously injured as a result of:

- (A) being in the aircraft;
- (B) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or
- (C) direct exposure to jet blast;

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

- (ii) the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or
- (iii) the aircraft is missing or is completely inaccessible.

(b) Incident reporting. An operator shall establish procedures for reporting incidents taking into account responsibilities described below and circumstances described in subparagraph (d) below.

1. OPS 1.085(b) specifies the responsibilities of crew members for reporting incidents that endanger, or could endanger, the safety of operation.
2. The commander or the operator of an aeroplane shall submit a report to the Authority of any incident that endangers or could endanger the safety of operation.
3. Reports must be despatched within 72 hours of the time when the incident was identified unless exceptional circumstances prevent this.
4. A commander shall ensure that all known or suspected technical defects and all exceedances of technical limitations occurring while he/she was responsible for the flight are recorded in the aircraft technical log. If the deficiency or exceedance of technical limitations endangers or could endanger the safety of operation, the commander must in addition initiate the submission of a report to the Authority in accordance with paragraph (b)(2) above.
5. In the case of incidents reported in accordance with subparagraph (b)(1), (b)(2) and (b)(3) above, arising from, or relating to, any failure, malfunction or defect in the aeroplane, its equipment or any item of ground support equipment or which cause or might cause adverse effects on the continuing airworthiness of the aeroplane, the operator must also inform the organisation responsible for the design or the supplier or, if applicable, the organisation responsible for continued airworthiness, at the same time as a report is submitted to the Authority.

(c) Accident and serious incident reporting.

An operator shall establish procedures for reporting accidents and serious incidents taking into account responsibilities described below and circumstances described in subparagraph (d) below.

1. A commander shall notify the operator of any accident or serious incident occurring while he/she was responsible for the flight. In the event that the commander is incapable of providing such notification, this task shall be undertaken by any other member of the crew if they are able to do so, note being taken of the succession of command specified by the operator.
2. An operator shall ensure that the Authority in the State of the operator, the nearest appropriate Authority (if not the Authority in the State of the operator), and any other organisation required by the State of the operator to be informed, are notified by the quickest means available of any accident or serious incident and — in the case of accidents only — at least before the aeroplane is moved unless exceptional circumstances prevent this.
3. The commander or the operator of an aeroplane shall submit a report to the authority in the State of the operator within 72 hours of the time when the accident or serious incident occurred.

(d) Specific reports.

Occurrences for which specific notification and reporting methods must be used are described below:

1. Air traffic incidents. A commander shall without delay notify the air traffic service unit concerned of the incident and shall inform them of his/her intention to submit an air traffic incident report after the flight has ended whenever an aircraft in flight has been endangered by:
  - (i) a near collision with any other flying device;
  - (ii) faulty air traffic procedures or lack of compliance with applicable procedures by air traffic services or by the flight crew;
  - (iii) failure of air traffic services facilities.

In addition, the commander shall notify the Authority of the incident.

2. Airborne collision avoidance system resolution advisory. A commander shall notify the air traffic service unit concerned and submit an ACAS report to the Authority whenever an aircraft in flight has manoeuvred in response to an ACAS resolution advisory.



3. Bird hazards and strikes
  - (i) A commander shall immediately inform the local air traffic service unit whenever a potential bird hazard is observed.
  - (ii) If he/she is aware that a bird strike has occurred, a commander shall submit a written bird strike report after landing to the Authority whenever an aircraft for which he/she is responsible suffers a bird strike that results in significant damage to the aircraft or the loss or malfunction of any essential service. If the bird strike is discovered when the commander is not available, the operator is responsible for submitting the report.
4. Dangerous goods incidents and accidents. An operator shall report dangerous goods incidents and accidents to the Authority and the appropriate Authority in the State where the accident or incident occurred, as provided for in Appendix 1 to OPS 1.1225. The first report shall be dispatched within 72 hours of the event unless exceptional circumstances prevent this and include the details that are known at that time. If necessary, a subsequent report must be made as soon as possible giving whatever additional information has been established. (See also OPS 1.1225).
5. Unlawful interference. Following an act of unlawful interference on board an aircraft, the commander or, in his/her absence, the operator shall submit a report, as soon as practicable to the local Authority and to the Authority in the State of the operator. (See also OPS 1.1245)
6. Encountering potential hazardous conditions. A commander shall notify the appropriate air traffic services unit as soon as practicable whenever a potentially hazardous condition such as an irregularity in a ground or navigational facility, a meteorological phenomenon or a volcanic ash cloud is encountered during flight.

OPS 1.425

Reserved

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*Appendix 1 to OPS 1.255***Fuel policy**

An operator must base the company fuel policy, including calculation of the amount of fuel to be on board for departure, on the following planning criteria:

1. Basic procedure

The usable fuel to be on board for departure must be the amount of:

- 1.1. Taxi fuel, which shall not be less than the amount, expected to be used prior to take-off. Local conditions at the departure aerodrome and APU consumption shall be taken into account;
- 1.2. Trip fuel, which shall include:
  - (a) fuel for take-off and climb from aerodrome elevation to initial cruising level/altitude, taking into account the expected departure routing; and
  - (b) fuel from top of climb to top of descent, including any step climb/descent; and
  - (c) fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and
  - (d) fuel for approach and landing at the destination aerodrome;
- 1.3. Contingency fuel, except as provided for in Paragraph 2 "Reduced Contingency Fuel", which shall be the higher of a. or b. below:
  - (a) Either:
    - (i) 5 % of the planned trip fuel or, in the event of in-flight re-planning, 5 % of the trip fuel for the remainder of the flight; or
    - (ii) Not less than 3 % of the planned trip fuel or, in the event of in-flight re-planning, 3 % of the trip fuel for the remainder of the flight, provided that an en-route alternate aerodrome is available in accordance with Appendix 2 to OPS 1.255; or
    - (iii) An amount of fuel sufficient for 20 minutes flying time based upon the planned trip fuel consumption provided that the operator has established a fuel consumption monitoring programme for individual aeroplanes and uses valid data determined by means of such a programme for fuel calculation; or
    - (iv) An amount of fuel based on a statistical method approved by the Authority which ensures an appropriate statistical coverage of the deviation from the planned to the actual trip fuel. This method is used to monitor the fuel consumption on each city pair/aeroplane combination and the operator uses this data for a statistical analysis to calculate contingency fuel for that city pair/aeroplane combination.
  - (b) An amount to fly for five minutes at holding speed at 1 500 ft (450 m), above the destination aerodrome in standard conditions.
- 1.4. Alternate fuel which shall:
  - (a) include:
    - (i) fuel for a missed approach from the applicable MDA/DH at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure; and
    - (ii) fuel for climb from missed approach altitude to cruising level/altitude, taking into account the expected departure routing; and
    - (iii) fuel for cruise from top of climb to top of descent, taking into account the expected routing; and
    - (iv) fuel for descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and

- (v) fuel for executing an approach and landing at the destination alternate aerodrome selected in accordance with OPS 1.295.
  - (b) where two destination alternate aerodromes are required in accordance with OPS 1.295(d), be sufficient to proceed to the alternate aerodrome which requires the greater amount of alternate fuel.
- 1.5. Final reserve fuel, which shall be:
- (a) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes; or
  - (b) for aeroplanes with turbine engines, fuel to fly for 30 minutes at holding speed at 1 500 ft (450 m) above aerodrome elevation in standard conditions, calculated with the estimated mass on arrival at the destination alternate aerodrome or the destination aerodrome, when no destination alternate aerodrome is required.
- 1.6. The minimum additional fuel, which shall permit:
- (a) the aeroplane to descend as necessary and proceed to an adequate alternate aerodrome in the event of engine failure or loss of pressurisation, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route, and
    - (i) hold there for 15 minutes at 1 500 ft (450 m) above aerodrome elevation in standard conditions; and
    - (ii) make an approach and landing,except that additional fuel is only required, if the minimum amount of fuel calculated in accordance with subparagraphs 1.2. to 1.5. above is not sufficient for such an event, and
  - (b) Holding for 15 minutes at 1 500 ft (450 m) above destination aerodrome elevation in standard conditions, when a flight is operated without a destination alternate aerodrome;
- 1.7. Extra fuel, which shall be at the discretion of the commander.

## 2. Reduced Contingency Fuel (RCF) Procedure

If an operator's fuel policy includes pre-flight planning to a Destination 1 aerodrome (commercial destination) with a reduced contingency fuel procedure using a decision point along the route and a Destination 2 aerodrome (optional refuel destination), the amount of usable fuel, on board for departure, shall be the greater of 2.1. or 2.2. below:

### 2.1. the sum of:

- (a) taxi fuel; and
- (b) trip fuel to the Destination 1 aerodrome, via the decision point; and
- (c) contingency fuel equal to not less than 5 % of the estimated fuel consumption from the decision point to the Destination 1 aerodrome; and
- (d) alternate fuel or no alternate fuel if the decision point is at less than six hours from the Destination 1 aerodrome and the requirements of OPS 1.295(c)(1)(ii) are fulfilled; and
- (e) final reserve fuel; and
- (f) additional fuel; and
- (g) extra fuel if required by the commander.

### 2.2. The sum of:

- (a) taxi fuel; and
- (b) trip fuel to the Destination 2 aerodrome, via the decision point; and
- (c) contingency fuel equal to not less than the amount calculated in accordance with subparagraph 1.3 above from departure aerodrome to the Destination 2 aerodrome; and
- (d) alternate fuel, if a Destination 2 alternate aerodrome is required; and

- (e) final reserve fuel; and
- (f) additional fuel; and
- (g) extra fuel if required by the commander.

3. pre-determined point (PDP) procedure

If an operator's fuel policy includes planning to a destination alternate aerodrome where the distance between the destination aerodrome and the destination alternate aerodrome is such that a flight can only be routed via a predetermined point to one of these aerodromes, the amount of usable fuel, on board for departure, shall be the greater of 3.1 or 3.2 below:

3.1. the sum of:

- (a) taxi fuel; and
- (b) trip fuel from the departure aerodrome to the destination aerodrome, via the predetermined point; and
- (c) contingency fuel calculated in accordance with subparagraph 1.3. above; and
- (d) additional fuel if required, but not less than:
  - (i) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15 % of the flight time planned to be spent at cruising level or two hours, whichever is less; or
  - (ii) for aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption above the destination aerodrome.

This shall not be less than final reserve fuel; and

- (e) extra fuel if required by the commander; or

3.2. the sum of:

- (a) taxi fuel; and
- (b) trip fuel from the departure aerodrome to the destination alternate aerodrome, via the predetermined point; and
- (c) contingency fuel calculated in accordance with subparagraph 1.3 above; and
- (d) additional fuel if required, but not less than:
  - (i) For aeroplanes with reciprocating engines: fuel to fly for 45 minutes; or
  - (ii) For aeroplanes with turbine engines: fuel to fly for 30 minutes at holding speed at 1 500 ft (450 m) above the destination alternate aerodrome elevation in standard conditions.

This shall not be less than final reserve fuel; and

- (e) Extra fuel if required by the commander.

4. Isolated aerodrome procedure

If an operator's fuel policy includes planning to an isolated aerodrome, the last possible point of diversion to any available en-route alternate aerodrome shall be used as the pre-determined point. See paragraph 3 above.

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## Appendix 2 to OPS 1.255

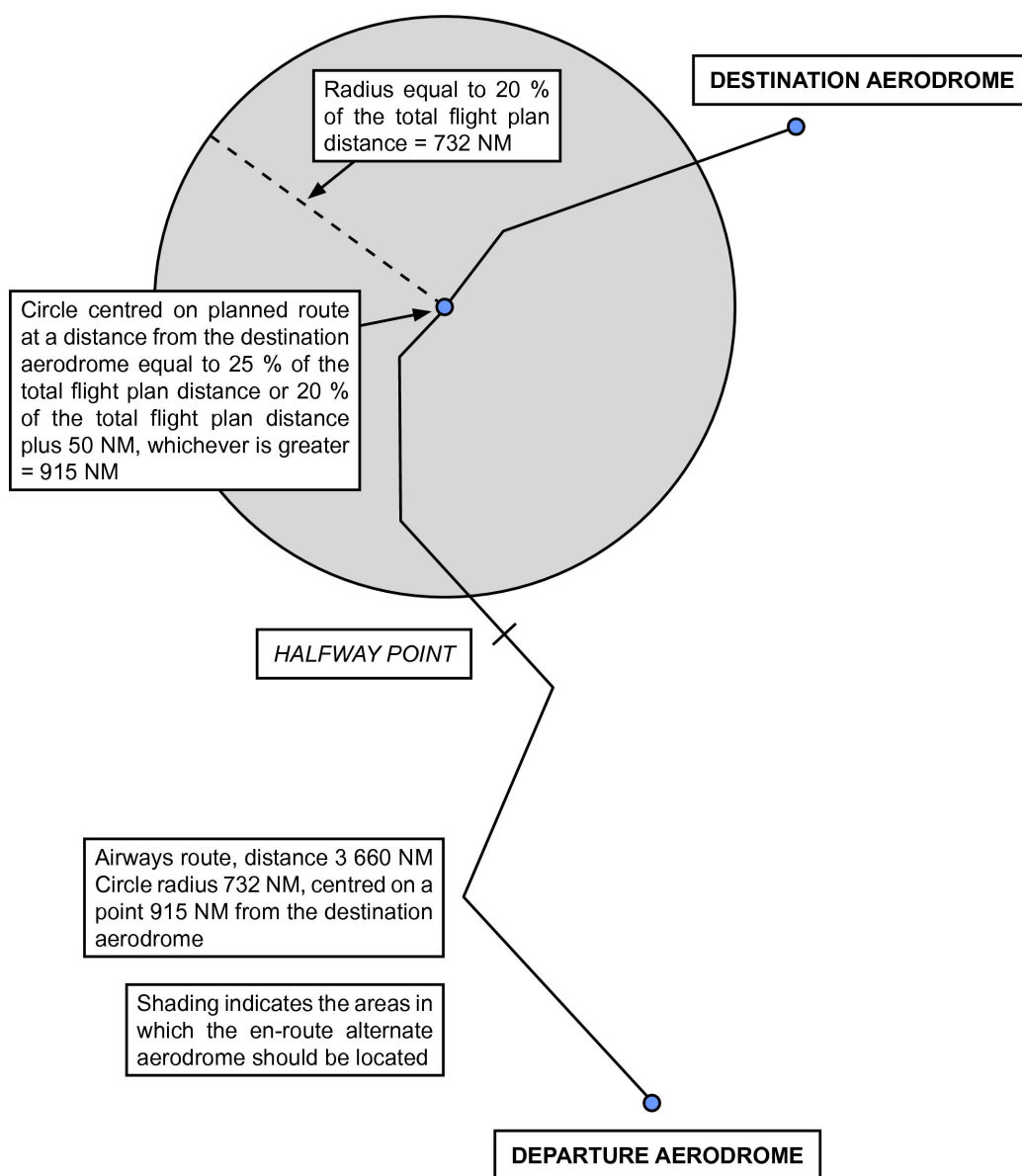
**Fuel policy**

Location of the 3 % En-Route Alternate (3 % ERA) aerodrome for the purposes of reducing contingency fuel to 3 % (See Appendix 1 to OPS 1.255 (1.3)(a)(ii) and OPS 1.192).

The 3 % ERA aerodrome shall be located within a circle having a radius equal to 20 % of the total flight plan distance, the centre of which lies on the planned route at a distance from the destination aerodrome of 25 % of the total flight plan distance, or at least 20 % of the total flight plan distance plus 50 nm, whichever is greater, all distances are to be calculated in still air conditions (see figure 1).

Figure 1

**Location of the 3 % en-route alternate (3 % ERA) aerodrome for the purposes of reducing contingency fuel to 3 %**



*Appendix 1 to OPS 1.270***Stowage of baggage and cargo**

Procedures established by an operator to ensure that hand baggage and cargo is adequately and securely stowed must take account of the following:

1. each item carried in a cabin must be stowed only in a location that is capable of restraining it;
  2. mass limitations placarded on or adjacent to stowages must not be exceeded;
  3. underseat stowages must not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by this equipment;
  4. items must not be stowed in toilets or against bulkheads that are incapable of restraining articles against movement forwards, sideways or upwards and unless the bulkheads carry a placard specifying the greatest mass that may be placed there;
  5. baggage and cargo placed in lockers must not be of such size that they prevent latched doors from being closed securely;
  6. baggage and cargo must not be placed where it can impede access to emergency equipment; and
  7. checks must be made before take-off, before landing, and whenever the fasten seat belts signs are illuminated or it is otherwise so ordered to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling (or other movement) as may be appropriate to the phase of flight.
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*Appendix 1 to OPS 1.305***Re/defuelling with passengers embarking, on board or disembarking**

An operator must establish operational procedures for re/defuelling with passengers embarking, on board or disembarking to ensure the following precautions are taken:

1. one qualified person must remain at a specified location during fuelling operations with passengers on board. This qualified person must be capable of handling emergency procedures concerning fire protection and fire-fighting, handling communications and initiating and directing an evacuation;
  2. a two-way communication shall be established and shall remain available by the aeroplane's inter-communication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the aeroplane;
  3. crew, staff and passengers must be warned that re/defuelling will take place;
  4. "Fasten Seat Belts" signs must be off;
  5. "NO SMOKING" signs must be on, together with interior lighting to enable emergency exits to be identified;
  6. passengers must be instructed to unfasten their seat belts and refrain from smoking;
  7. the minimum required number of cabin crew specified by OPS 1.990 must be on board and be prepared for an immediate emergency evacuation;
  8. if the presence of fuel vapour is detected inside the aeroplane, or any other hazard arises during re/defuelling, fuelling must be stopped immediately;
  9. the ground area beneath the exits intended for emergency evacuation and slide deployment areas must be kept clear; and
  10. provision is made for a safe and rapid evacuation.
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*Appendix 1 to OPS 1.311***Minimum number of cabin crew required to be on board an aeroplane during ground operations with passengers**

When operating under OPS 1.311 an operator shall establish operational procedures to ensure that:

1. electrical power is available on the aeroplane;
  2. a means of initiating an evacuation is available to the senior cabin crew member, or at least one member of the flight crew is on the flight deck;
  3. cabin crew stations and associated duties are specified in the operations manual; and
  4. cabin crew remain aware of the position of servicing and loading vehicles at and near the exits.
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## SUBPART E

## ALL WEATHER OPERATIONS

## OPS 1.430

**Aerodrome operating minima — General**

(See Appendix 1 (old) and Appendix 1 (new) to OPS 1.430)

- (a)1. An operator shall establish, for each aerodrome planned to be used, aerodrome operating minima that are not lower than the values given in Appendix 1 (Old) or Appendix 1 (New) as applicable. The method of determination of such minima must be acceptable to the Authority. Such minima shall not be lower than any that may be established for such aerodromes by the State in which the aerodrome is located, except when specifically approved by that State. The use of HUD, HUDLS or EVS may allow operations with lower visibilities than normally associated with the aerodrome operating minima. States which promulgate aerodrome operating minima may also promulgate regulations for reduced visibility minima associated with the use of HUD or EVS.
- (a)2. Notwithstanding paragraph (a)1. above, in-flight calculation of minima for use at unplanned alternate aerodromes and/or for approaches utilising EVS shall be carried out in accordance with a method acceptable to the Authority.
- (b) In establishing the aerodrome operating minima which will apply to any particular operation, an operator must take full account of:
  - 1. the type, performance and handling characteristics of the aeroplane;
  - 2. the composition of the flight crew, their competence and experience;
  - 3. the dimensions and characteristics of the runways which may be selected for use;
  - 4. the adequacy and performance of the available visual and non-visual ground aids (See Appendix 1 (New) to OPS 1.430 Table 6a);
  - 5. the equipment available on the aeroplane for the purpose of navigation and/or control of the flight path, as appropriate, during the take-off, the approach, the flare, the landing, roll-out and the missed approach;
  - 6. the obstacles in the approach, missed approach and the climb-out areas required for the execution of contingency procedures and necessary clearance;
  - 7. the obstacle clearance altitude/height for the instrument approach procedures;
  - 8. the means to determine and report meteorological conditions; and
  - 9. the flight technique to be used during the final approach.
- (c) The aeroplane categories referred to in this Subpart must be derived in accordance with the method given in Appendix 2 to OPS 1.430 (c).
- (d)1. All approaches shall be flown as stabilised approaches (SAp) unless otherwise approved by the Authority for a particular approach to a particular runway.
- (d)2. All non-precision approaches shall be flown using the continuous descent final approaches (CDFA) technique unless otherwise approved by the Authority for a particular approach to a particular runway. When calculating the minima in accordance with Appendix 1 (New), the operator shall ensure that the applicable minimum RVR is increased by 200 metres (m) for Cat A/B aeroplanes and by 400 m for Cat C/D aeroplanes for approaches not flown using the CDFA technique, providing that the resulting RVR/CMV value does not exceed 5 000 m.
- (d)3. Notwithstanding the requirements in (d)2. above, an Authority may exempt an operator from the requirement to increase the RVR when not applying the CDFA technique.

- (d)4. Exemptions as described in paragraph (d)3. must be limited to locations where there is a clear public interest to maintain current operations. The exemptions must be based on the operator's experience, training programme and flight crew qualification. The exemptions must be reviewed at regular intervals and must be terminated as soon as facilities are improved to allow application of the CDFA technique.
- (e)1. An operator must ensure that either Appendix 1 (Old) or Appendix 1 (New) to OPS 1.430 is applied. However, an operator must ensure that Appendix 1 (New) to OPS 1.430 is applied not later than three years after publication date.
- (e)2. Notwithstanding the requirements in (e)1. above, an Authority may exempt an operator from the requirement to increase the RVR above 1 500 m (Cat A/B aeroplanes) or above 2 400 m (Cat C/D aeroplanes), when approving an operation to a particular runway where it is not practicable to fly an approach using the CDFA technique or where the criteria in paragraph (c) of Appendix 1 (New) to OPS 1.430 cannot be met.
- (e)3. Exemptions as described in paragraph (e)2. must be limited to locations where there is a clear public interest to maintain current operations. The exemptions must be based on the operator's experience, training programme and flight crew qualification. The exemptions must be reviewed at regular intervals and must be terminated as soon as facilities are improved to allow application of the CDFA technique.

#### OPS 1.435

#### Terminology

Terms used in this Subpart have the following meaning:

1. "Circling". The visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.
2. "Low visibility procedures (LVP)". Procedures applied at an aerodrome for the purpose of ensuring safe operations during Lower than Standard Category I, Other than Standard Category II, Category II and III approaches and low visibility take-offs.
3. "Low visibility take-off (LVTO)". A take-off where the runway visual range (RVR) is less than 400 m.
4. "Flight control system". A system which includes an automatic landing system and/or a hybrid landing system.
5. "Fail-Passive flight control system". A flight control system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude but the landing is not completed automatically. For a fail-passive automatic flight control system the pilot assumes control of the aeroplane after a failure.
6. "Fail-Operational flight control system". A flight control system is fail-operational if, in the event of a failure below alert height, the approach, flare and landing, can be completed automatically. In the event of a failure, the automatic landing system will operate as a fail-passive system.
7. "Fail-operational hybrid landing system". A system which consists of a primary fail-passive automatic landing system and a secondary independent guidance system enabling the pilot to complete a landing manually after failure of the primary system.
8. "Visual approach". An approach when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain.
9. "Continuous descent final approach (CDFA)". A specific technique for flying the final-approach segment of a non-precision instrument approach procedure as a continuous descent, without level-off, from an altitude/height at or above the Final Approach Fix altitude / height to a point approximately 15 m (50 feet) above the landing runway threshold or the point where the flare manoeuvre should begin for the type of aeroplane flown.
10. "Stabilised approach (SAp)". An approach which is flown in a controlled and appropriate manner in terms of configuration, energy and control of the flight path from a pre-determined point or altitude/height down to a point 50 feet above the threshold or the point where the flare manoeuvre is initiated if higher.
11. "Head-up display (HUD)". A display system which presents flight information into the pilot's forward external field of view and which does not significantly restrict the external view.

12. "Head-up guidance landing system (HUDLS)". The total airborne system which provides head-up guidance to the pilot during the approach and landing and/or go-around. It includes all sensors, computers, power supplies, indications and controls. A HUDLS is typically used for primary approach guidance to decision heights of 50 ft.
13. "Hybrid head-up display landing system (hybrid HUDLS)". A system which consists of a primary fail-passive automatic landing system and a secondary independent HUD/HUDLS enabling the pilot to complete a landing manually after failure of the primary system.  
  
 Note: Typically, the secondary independent HUD/HUDLS provides guidance which normally takes the form of command information, but it may alternatively be situation (or deviation) information.
14. "Enhanced vision system (EVS)". An electronic means of displaying a real-time image of the external scene through the use of imaging sensors.
15. "Converted meteorological visibility (CMV)". A value (equivalent to an RVR) which is derived from the reported meteorological visibility, as converted in accordance with the requirements in this subpart.
16. "Lower than Standard Category I Operation". A Category I Instrument Approach and Landing Operation using Category I DH, with an RVR lower than would normally be associated with the applicable DH.
17. "Other than Standard Category II Operation". A Category II Instrument Approach and Landing Operation to a runway where some or all of the elements of the ICAO Annex 14 Precision Approach Category II lighting system are not available.
18. "GNSS landing system (GLS)". An approach operation using augmented GNSS information to provide guidance to the aircraft based on its lateral and vertical GNSS position. (It uses geometric altitude reference for its final approach slope).

#### OPS 1.440

### Low visibility operations — General operating rules

(See Appendix 1 to OPS 1.440)

- (a) An operator shall not conduct Category II, Other than Standard Category II or III operations unless:
  1. each aeroplane concerned is certificated for operations with decision heights below 200 ft, or no decision height, and equipped in accordance with CS-AWO on all weather operations or an equivalent accepted by the Authority;
  2. a suitable system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operation;
  3. the operations are approved by the Authority;
  4. the flight crew consists of at least two pilots; and
  5. decision height is determined by means of a radio altimeter.
- (b) An operator shall not conduct low visibility take-offs in less than 150 m RVR (Category A, B and C aeroplanes) or 200 m RVR (Category D aeroplanes) unless approved by the Authority.
- (c) An operator shall not conduct lower than Standard Category I operations unless approved by the Authority.

#### OPS 1.445

### Low visibility operations — Aerodrome considerations

- (a) An operator shall not use an aerodrome for Category II or III operations unless the aerodrome is approved for such operations by the State in which the aerodrome is located.
- (b) An operator shall verify that low visibility procedures (LVP) have been established, and will be enforced, at those aerodromes where low visibility operations are to be conducted.

## OPS 1.450

**Low visibility operations — Training and qualifications**

(See Appendix 1 to OPS 1.450)

An operator shall ensure that, prior to conducting low visibility take-off, lower than Standard Category I, other than Standard Category II, Category II and III operations or approaches utilising EVS:

1. Each flight crew member:
  - (i) Completes the training and checking requirements prescribed in Appendix 1 including Flight simulator training in operating to the limiting values of RVR/CMV and Decision Height appropriate to the operator's approval; and
  - (ii) Is qualified in accordance with Appendix 1;
2. The training and checking is conducted in accordance with a detailed syllabus approved by the Authority and included in the Operations Manual. This training is in addition to that prescribed in Subpart N; and
3. The flight crew qualification is specific to the operation and the aeroplane type.

## OPS 1.455

**Low visibility operations — Operating procedures**

(See Appendix 1 to OPS 1.455)

- (a) An operator must establish procedures and instructions to be used for low visibility take-off, approaches utilising EVS, Lower than Standard Category I, other than Standard Category II, Category II and III operations. These procedures must be included in the Operations Manual and contain the duties of flight crew members during taxiing, take-off, approach, flare, landing, roll-out and missed approach as appropriate.
- (b) The commander shall satisfy himself/herself that:
  1. The status of the visual and non-visual facilities is sufficient prior to commencing a low visibility take-off, an approach utilising EVS, a lower than Standard Category I, an other than Standard Category II, or a Category II or III approach;
  2. Appropriate LVPs are in force according to information received from Air Traffic Services, before commencing a low visibility take-off, a lower than Standard Category I, an other than Standard Category II, or a Category II or III approach; and
  3. The flight crew members are properly qualified prior to commencing a low visibility take-off in an RVR of less than 150 m (Category A, B and C aeroplanes) or 200 m (Cat D aeroplanes), an approach utilising EVS, a lower than Standard Category I, an other than Standard Category II or a Category II or III approach.

## OPS 1.460

**Low visibility operations — Minimum equipment**

- (a) An operator must include in the Operations Manual the minimum equipment that has to be serviceable at the commencement of a low visibility take-off, a lower than Standard Category I approach, an Other than Standard Category II approach, an approach utilising EVS, or a Category II or III approach in accordance with the AFM or other approved document.
- (b) The commander shall satisfy himself/herself that the status of the aeroplane and of the relevant airborne systems is appropriate for the specific operation to be conducted.

OPS 1.465

**VFR Operating minima**

(See Appendix 1 to OPS 1.465)

An operator shall ensure that:

1. VFR flights are conducted in accordance with the Visual Flight Rules and in accordance with the Table in Appendix 1 to OPS 1.465.
  2. Special VFR flights are not commenced when the visibility is less than 3 km and not otherwise conducted when the visibility is less than 1,5 km.
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## Appendix 1 (Old) to OPS 1.430

**Aerodrome operating minima**

## (a) Take-off minima

## 1. General

- (i) Take-off minima established by the operator must be expressed as visibility or RVR limits, taking into account all relevant factors for each aerodrome planned to be used and the aeroplane characteristics. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions (e.g. ceiling) must be specified.
- (ii) The commander shall not commence take-off unless the weather conditions at the aerodrome of departure are equal to or better than applicable minima for landing at that aerodrome unless a suitable take-off alternate aerodrome is available.
- (iii) When the reported meteorological visibility is below that required for take-off and RVR is not reported, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.
- (iv) When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.

- 2. Visual reference. The take-off minima must be selected to ensure sufficient guidance to control the aeroplane in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of the critical power unit.

## 3. Required RVR/visibility

- (i) For multi-engined aeroplanes, whose performance is such that, in the event of a critical power unit failure at any point during take-off, the aeroplane can either stop or continue the take-off to a height of 1 500 ft above the aerodrome while clearing obstacles by the required margins, the take-off minima established by an operator must be expressed as RVR/Visibility values not lower than those given in Table 1 below except as provided in paragraph 4. below:

Table 1

**RVR/visibility for take-off**

Take-off RVR/visibility	
Facilities	RVR/visibility (Note 3)
Nil (Day only)	500 m
Runway edge lighting and/or centreline marking	250/300 m (Notes 1 and 2)
Runway edge and centreline lighting	200/250 m (Note 1)
Runway edge and centreline lighting and multiple RVR information	150/200 m (Notes 1 and 4)

Note 1: The higher values apply to Category D aeroplanes.

Note 2: For night operations at least runway edge and runway end lights are required.

Note 3: The reported RVR/Visibility value representative of the initial part of the take-off run can be replaced by pilot assessment.

Note 4: The required RVR value must be achieved for all of the relevant RVR reporting points with the exception given in Note 3 above.

- (ii) For multi-engined aeroplanes whose performance is such that they cannot comply with the performance conditions in subparagraph (a)(3)(i) above in the event of a critical power unit failure, there may be a need to re-land immediately and to see and avoid obstacles in the take-off area. Such aeroplanes may be operated to the following take-off minima provided they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified. The take-off minima established by an operator must be based upon the height from which the one engine inoperative net take-off flight path can be constructed. The RVR minima used may not be lower than either of the values given in Table 1 above or Table 2 below.

Table 2

**Assumed engine failure height above the runway versus RVR/Visibility**

Take-off RVR/visibility — flight path	
Assumed engine failure height above the take-off runway	RVR/visibility (Note 2)
< 50 ft	200 m
51-100 ft	300 m
101-150 ft	400 m
151-200 ft	500 m
201-300 ft	1 000 m
> 300 ft	1 500 m (Note 1)

Note 1: 1 500 m is also applicable if no positive take-off flight path can be constructed.

Note 2: The reported RVR/visibility value representative of the initial part of the take-off run can be replaced by pilot assessment.

- (iii) When reported RVR, or meteorological visibility is not available, the commander shall not commence take-off unless he/she can determine that the actual conditions satisfy the applicable take-off minima.

4. Exceptions to paragraph (a)(3)(i) above:

- (i) Subject to the approval of the Authority, and provided the requirements in paragraphs (A) to (E) below have been satisfied, an operator may reduce the take-off minima to 125 m RVR (Category A, B and C aeroplanes) or 150 m RVR (Category D aeroplanes) when:

- (A) Low visibility procedures are in force;
- (B) High intensity runway centreline lights spaced 15 m or less and high intensity edge lights spaced 60 m or less are in operation;
- (C) Flight crew members have satisfactorily completed training in a flight simulator;
- (D) A 90 m visual segment is available from the cockpit at the start of the take-off run; and
- (E) The required RVR value has been achieved for all of the relevant RVR reporting points.

- (ii) Subject to the approval of the Authority, an operator of an aeroplane using an approved lateral guidance system for take-off may reduce the take-off minima to an RVR less than 125 m (Category A, B and C aeroplanes) or 150 m (Category D aeroplanes) but not lower than 75 m provided runway protection and facilities equivalent to Category III landing operations are available.

(b) Non-precision approach

1. System minima

- (i) An operator must ensure that system minima for non-precision approach procedures, which are based upon the use of ILS without glide path (LLZ only), VOR, NDB, SRA and VDF are not lower than the MDH values given in Table 3 below.

Table 3

**System minima for non-precision approach aids**

System minima	
Facility	Lowest MDH
ILS (no glide path — LLZ)	250 ft
SRA (terminating at 1/2 NM)	250 ft
SRA (terminating at 1 NM)	300 ft
SRA (terminating at 2 NM)	350 ft
VOR	300 ft
VOR/DME	250 ft
NDB	300 ft
VDF (QDM and QGH)	300 ft

2. Minimum descent height. An operator must ensure that the minimum descent height for a non-precision approach is not lower than either:
  - (i) The OCH/OCL for the category of aeroplane; or
  - (ii) The system minimum.
3. Visual reference. A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
  - (i) elements of the approach light system;
  - (ii) the threshold;
  - (iii) the threshold markings;
  - (iv) the threshold lights;
  - (v) the threshold identification lights;
  - (vi) the visual glide slope indicator;
  - (vii) the touchdown zone or touchdown zone markings;
  - (viii) the touchdown zone lights;
  - (ix) runway edge lights; or
  - (x) other visual references accepted by the Authority.
4. Required RVR. The lowest minima to be used by an operator for non-precision approaches are:

Table 4a

**RVR for non-precision approach — full facilities**

Non-precision approach minima Full facilities (Notes 1, 5, 6 and 7)				
MDH	RVR/Aeroplane Category			
	A	B	C	D
250-299 ft	800 m	800 m	800 m	1 200 m
300-449 ft	900 m	1 000 m	1 000 m	1 400 m
450-649 ft	1 000 m	1 200 m	1 200 m	1 600 m
650 ft and above	1 200 m	1 400 m	1 400 m	1 800 m

Table 4b

**RVR for non-precision approach — intermediate facilities**

Non-precision approach minima Intermediate facilities (Notes 2, 5, 6 and 7)				
MDH	RVR/Aeroplane Category			
	A	B	C	D
250-299 ft	1 000 m	1 100 m	1 200 m	1 400 m
300-449 ft	1 200 m	1 300 m	1 400 m	1 600 m
450-649 ft	1 400 m	1 500 m	1 600 m	1 800 m
650 ft and above	1 500 m	1 500 m	1 800 m	2 000 m



Table 4c

**RVR for non-precision approach — basic facilities**

Non-precision approach minima Basic facilities (Notes 3, 5, 6 and 7)				
MDH	RVR/aeroplane category			
	A	B	C	D
250-299 ft	1 200 m	1 300 m	1 400 m	1 600 m
300-449 ft	1 300 m	1 400 m	1 600 m	1 800 m
450-649 ft	1 500 m	1 500 m	1 800 m	2 000 m
650 ft and above	1 500 m	1 500 m	2 000 m	2 000 m

Table 4d

**RVR for non-precision approach — Nil approach light facilities**

Non-precision approach minima Nil approach light facilities (Notes 4, 5, 6 and 7)				
MDH	RVR/aeroplane category			
	A	B	C	D
250-299 ft	1 500 m	1 500 m	1 600 m	1 800 m
300-449 ft	1 500 m	1 500 m	1 800 m	2 000 m
450-649 ft	1 500 m	1 500 m	2 000 m	2 000 m
650 ft and above	1 500 m	1 500 m	2 000 m	2 000 m

Note 1: Full facilities comprise runway markings, 720 m or more of HI/MI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 2: Intermediate facilities comprise runway markings, 420-719 m of HI/MI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 3: Basic facilities comprise runway markings, <420 m of HI/MI approach lights, any length of LI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 4: Nil approach light facilities comprise runway markings, runway edge lights, threshold lights, runway end lights or no lights at all.

Note 5: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glide slope guidance (e.g. PAPI) is also visible at the minimum descent height.

Note 6: The above figures are either reported RVR or meteorological visibility converted to RVR as in subparagraph (h) below.

Note 7: The MDH mentioned in Table 4a, 4b, 4c and 4d refers to the initial calculation of MDH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purposes, e.g. conversion to MDA.

5. Night operations. For night operations at least runway edge, threshold and runway end lights must be on.

(c) Precision approach — Category I operations

1. General. A Category I operation is a precision instrument approach and landing using ILS, MLS or PAR with a decision height not lower than 200 ft and with a runway visual range not less than 550 m.
2. Decision height. An operator must ensure that the decision height to be used for a Category I precision approach is not lower than:
  - (i) The minimum decision height specified in the Aeroplane Flight Manual (AFM) if stated;
  - (ii) The minimum height to which the precision approach aid can be used without the required visual reference;
  - (iii) The OCH/OCL for the category of aeroplane; or
  - (iv) 200 ft.

3. Visual reference. A pilot may not continue an approach below the Category I decision height, determined in accordance with subparagraph (c)2. above, unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
- (i) Elements of the approach light system;
  - (ii) The threshold;
  - (iii) The threshold markings;
  - (iv) The threshold lights;
  - (v) The threshold identification lights;
  - (vi) The visual glide slope indicator;
  - (vii) The touchdown zone or touchdown zone markings;
  - (viii) The touchdown zone lights; or
  - (ix) Runway edge lights.
4. Required RVR. The lowest minima to be used by an operator for Category I operations are:

Table 5

**RVR for Cat I approach v. facilities and DH**

Decision height (Note 7)	Category I minima			
	Facilities/RVR (Note 5)			
	Full (Notes 1 and 6)	Interm (Notes 2 and 6)	Basic (Notes 3 and 6)	Nil (Notes 4 and 6)
200 ft	550 m	700 m	800 m	1 000 m
201-250 ft	600 m	700 m	800 m	1 000 m
251-300 ft	650 m	800 m	900 m	1 200 m
301 ft and above	800 m	900 m	1 000 m	1 200 m

Note 1: Full facilities comprise runway markings, 720 m or more of HI/MI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 2: Intermediate facilities comprise runway markings, 420-719 m of HI/MI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 3: Basic facilities comprise runway markings, <420 m of HI/MI approach lights, any length of LI approach lights, runway edge lights, threshold lights and runway end lights. Lights must be on.

Note 4: Nil approach light facilities comprise runway markings, runway edge lights, threshold lights, runway end lights or no lights at all.

Note 5: The above figures are either the reported RVR or meteorological visibility converted to RVR in accordance with paragraph (h).

Note 6: The Table is applicable to conventional approaches with a glide slope angle up to and including 4° (degree).

Note 7: The DH mentioned in the Table 5 refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 feet, which may be done for operational purposes, (e.g. conversion to DA).

5. Single pilot operations. For single pilot operations, an operator must calculate the minimum RVR for all approaches in accordance with OPS 1.430 and this Appendix. An RVR of less than 800 m is not permitted except when using a suitable autopilot coupled to an ILS or MLS, in which case normal minima apply. The Decision Height applied must not be less than 1,25 x the minimum use height for the autopilot.
  6. Night operations. For night operations at least runway edge, threshold and runway end lights must be on.
- (d) Precision approach — Category II operations
1. General. A Category II operation is a precision instrument approach and landing using ILS or MLS with:
    - (i) A decision height below 200 ft but not lower than 100 ft; and
    - (ii) A runway visual range of not less than 300 m.
  2. Decision height. An operator must ensure that the decision height for a Category II operation is not lower than:
    - (i) The minimum decision height specified in the AFM, if stated;
    - (ii) The minimum height to which the precision approach aid can be used without the required visual reference;
    - (iii) The OCH/OCL for the category of aeroplane;
    - (iv) The decision height to which the flight crew is authorised to operate; or
    - (v) 100 ft.
  3. Visual reference. A pilot may not continue an approach below the Category II decision height determined in accordance with subparagraph (d)2. above unless visual reference containing a segment of at least three consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barette of the touchdown zone lighting.
  4. Required RVR. The lowest minima to be used by an operator for Category II operations are:

Table 6

**RVR for Cat II approach v. DH**

Category II minima		
Decision height	Auto-coupled to below DH (see Note 1)	
	RVR/aeroplane Category A, B and C	RVR/aeroplane Category D
100 ft-120 ft	300 m	300 m (Note 2)/350 m
121 ft-140 ft	400 m	400 m
141 ft and above	450 m	450 m

Note 1: The reference to "auto-coupled to below DH" in this table means continued use of the automatic flight control system down to a height which is not greater than 80 % of the applicable DH. Thus airworthiness requirements may, through minimum engagement height for the automatic flight control system, affect the DH to be applied.

Note 2: 300 m may be used for a Category D aeroplane conducting an auto land.

(e) Precision approach — Category III operations

1. General. Category III operations are subdivided as follows:

(i) Category III A operations. A precision instrument approach and landing using ILS or MLS with:

(A) A decision height lower than 100 ft; and

(B) A runway visual range not less than 200 m.

(ii) Category III B operations. A precision instrument approach and landing using ILS or MLS with:

(A) A decision height lower than 50 ft, or no decision height; and

(B) A runway visual range lower than 200 m but not less than 75 m.

*Note:* Where the decision height (DH) and runway visual range (RVR) do not fall within the same category, the RVR will determine in which category the operation is to be considered.

2. Decision height. For operations in which a decision height is used, an operator must ensure that the decision height is not lower than:

(i) The minimum decision height specified in the AFM, if stated;

(ii) The minimum height to which the precision approach aid can be used without the required visual reference; or

(iii) The decision height to which the flight crew is authorised to operate.

3. No decision height operations. Operations with no decision height may only be conducted if:

(i) The operation with no decision height is authorised in the AFM;

(ii) The approach aid and the aerodrome facilities can support operations with no decision height; and

(iii) The operator has an approval for CAT III operations with no decision height.

*Note:* In the case of a CAT III runway it may be assumed that operations with no decision height can be supported unless specifically restricted as published in the AIP or NOTAM.

4. Visual reference

(i) For Category IIIA operations, and for category IIIB operations with fail-passive flight control systems, a pilot may not continue an approach below the decision height determined in accordance with subparagraph (e)2. above unless a visual reference containing a segment of at least three consecutive lights being the centreline of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained.

(ii) For Category IIIB operations with fail-operational flight control systems using a decision height, a pilot may not continue an approach below the Decision Height, determined in accordance with subparagraph (e)2. above, unless a visual reference containing at least one centreline light is attained and can be maintained.

(iii) For Category III operations with no decision height there is no requirement for visual contact with the runway prior to touchdown.

5. Required RVR. The lowest minima to be used by an operator for Category III operations are:

Table 7

**RVR for Cat III approach v. DH and roll-out control/guidance system**

Category III minima			
Approach Category	Decision height (ft) (Note 2)	Roll-out control/ guidance system	RVR (m)
III A	Less than 100 ft	Not required	200 m
III B	Less than 100 ft	Fail-passive	150 m (Notes 1)
III B	Less than 50 ft	Fail-passive	125 m
III B	Less than 50 ft or no decision height	Fail-operational	75 m

Note 1: For aeroplanes certificated in accordance with CS-AWO on all weather operations 321(b)(3).

Note 2: Flight control system redundancy is determined under CS-AWO on all weather operations by the minimum certificated decision height.

## (f) Circling

1. The lowest minima to be used by an operator for circling are:

Table 8

**Visibility and MDH for circling v. aeroplane category**

	Aeroplane Category			
	A	B	C	D
MDH	400 ft	500 ft	600 ft	700 ft
Minimum meteorological visibility	1 500 m	1 600 m	2 400 m	3 600 m

2. Circling with prescribed tracks is an accepted procedure within the meaning of this paragraph

## (g) Visual Approach. An operator shall not use an RVR of less than 800 m for a visual approach.

## (h) Conversion of reported meteorological visibility to RVR

1. An operator must ensure that a meteorological visibility to RVR conversion is not used for calculating take-off minima, Category II or III minima or when a reported RVR is available.

Note: If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. "RVR more than 1 500 metres", it is not considered to be a reported RVR in this context and the Conversion Table may be used.

2. When converting meteorological visibility to RVR in all other circumstances than those in subparagraph (h)1. above, an operator must ensure that the following Table is used:

Table 9

**Conversion of visibility to RVR**

Lighting elements in operation	RVR = Reported Met. Visibility x	
	Day	Night
HI approach and runway lighting	1,5	2,0
Any type of lighting installation other than above	1,0	1,5
No lighting	1,0	Not applicable

## Appendix 1 (New) to OPS 1.430

**Aerodrome operating minima**

## (a) Take-off minima

## 1. General

- (i) Take-off minima established by the operator must be expressed as visibility or RVR limits, taking into account all relevant factors for each aerodrome planned to be used and the aeroplane characteristics. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions (e.g. ceiling) must be specified.
- (ii) The commander shall not commence take-off unless the weather conditions at the aerodrome of departure are equal to or better than applicable minima for landing at that aerodrome unless a suitable take-off alternate aerodrome is available.
- (iii) When the reported meteorological visibility is below that required for take-off and RVR is not reported, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.
- (iv) When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the commander can determine that the RVR/visibility along the take-off runway is equal to or better than the required minimum.

- 2. Visual reference. The take-off minima must be selected to ensure sufficient guidance to control the aeroplane in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of the critical power unit.

## 3. Required RVR/visibility

- (i) For multi-engined aeroplanes, whose performance is such that, in the event of a critical power unit failure at any point during take-off, the aeroplane can either stop or continue the take-off to a height of 1 500 ft above the aerodrome while clearing obstacles by the required margins, the take-off minima established by an operator must be expressed as RVR/Visibility values not lower than those given in Table 1 below except as provided in paragraph 4. below:

Table 1

**RVR/visibility for take-off**

Take-off RVR/visibility	
Facilities	RVR/visibility (Note 3)
Nil (day only)	500 m
Runway edge lighting and/or centreline marking	250/300 m (Notes 1 and 2)
Runway edge and centreline lighting	200/250 m (Note 1)
Runway edge and centreline lighting and multiple RVR information	150/200 m (Notes 1 and 4)

Note 1: The higher values apply to Category D aeroplanes.

Note 2: For night operations at least runway edge and runway end lights are required.

Note 3: The reported RVR/visibility value representative of the initial part of the take-off run can be replaced by pilot assessment.

Note 4: The required RVR value must be achieved for all of the relevant RVR reporting points with the exception given in Note 3 above.

- (ii) For multi-engined aeroplanes whose performance is such that they cannot comply with the performance conditions in subparagraph (a)(3)(i) above in the event of a critical power unit failure, there may be a need to re-land immediately and to see and avoid obstacles in the take-off area. Such aeroplanes may be operated to the following take-off minima provided they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the height specified. The take-off minima established by an operator must be based upon the height from which the one engine inoperative net take-off flight path can be constructed. The RVR minima used may not be lower than either of the values given in Table 1 above or Table 2 below.

Table 2

**Assumed engine failure height above the runway versus RVR/visibility**

Take — off RVR/visibility	
Assumed engine failure height above the take-off runway	RVR/visibility (Note 2)
< 50 ft	200 m
51-100 ft	300 m
101-150 ft	400 m
151-200 ft	500 m
201-300 ft	1 000 m
> 300 ft	1 500 m (Note 1)

Note 1: 1 500 m is also applicable if no positive take-off flight path can be constructed.

Note 2: The reported RVR/visibility value representative of the initial part of the take-off run can be replaced by pilot assessment.

- (iii) When reported RVR, or meteorological visibility is not available, the commander shall not commence take-off unless he can determine that the actual conditions satisfy the applicable take-off minima.

4. Exceptions to subparagraph (a)(3)(i) above:

- (i) Subject to the approval of the Authority, and provided the requirements in paragraphs (A) to (E) below have been satisfied, an operator may reduce the take-off minima to 125 m RVR (Category A, B and C aeroplanes) or 150 m RVR (Category D aeroplanes) when:

- (A) low visibility procedures are in force;
- (B) high intensity runway centreline lights spaced 15 m or less and high intensity edge lights spaced 60 m or less are in operation;
- (C) flight crew members have satisfactorily completed training in a Flight Simulator;
- (D) a 90 m visual segment is available from the cockpit at the start of the take-off run; and
- (E) the required RVR value has been achieved for all of the relevant RVR reporting points

- (ii) Subject to the approval of the Authority, an operator of an aeroplane using either:

- (A) an approved lateral guidance system; or,
- (B) an approved HUD/HUDLS for take-off may reduce the take-off minima to an RVR less than 125 m (Category A, B and C aeroplanes) or 150 m (Category D aeroplanes) but not lower than 75 m provided runway protection and facilities equivalent to Category III landing operations are available.

(b) Category I, APV and non-precision approach operations

1. A Category I approach operation is a precision instrument approach and landing using ILS, MLS, GLS (GNSS/GBAS) or PAR with a decision height not lower than 200 ft and with an RVR not less than 550 m, unless accepted by the Authority.
2. A non-precision approach (NPA) operation is an instrument approach using any of the facilities described in Table 3 (System minima), with a MDH or DH not lower than 250 ft and an RVR/CMV of not less than 750 m, unless accepted by the Authority.

3. An APV operation is an instrument approach which utilises lateral and vertical guidance, but does not meet the requirements established for precision approach and landing operations, with a DH not lower than 250 ft and a runway visual range of not less than 600m unless approved by the Authority.
4. Decision height (DH). An operator must ensure that the decision height to be used for an approach is not lower than:
  - (i) the minimum height to which the approach aid can be used without the required visual reference; or
  - (ii) the OCH for the category of aeroplane; or
  - (iii) the published approach procedure decision height where applicable; or
  - (iv) 200 ft for Category I approach operations; or
  - (v) the system minimum in Table 3; or
  - (vi) the lowest decision height specified in the Aeroplane Flight Manual (AFM) or equivalent document, if stated;whichever is higher.
5. Minimum descent height (MDH). An operator must ensure that the minimum descent height for an approach is not lower than:
  - (i) the OCH for the category of aeroplane; or
  - (ii) the system minimum in Table 3; or
  - (iii) the minimum descent height specified in the Aeroplane Flight Manual (AFM) if stated;whichever is higher.
6. Visual reference. A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
  - (i) elements of the approach light system;
  - (ii) the threshold;
  - (iii) the threshold markings;
  - (iv) the threshold lights;
  - (v) the threshold identification lights;
  - (vi) the visual glide slope indicator;
  - (vii) the touchdown zone or touchdown zone markings;
  - (viii) the touchdown zone lights;
  - (ix) runway edge lights; or
  - (x) other visual references accepted by the Authority.



Table 3

**System minima v. facilities**

System minima	
Facility	Lowest DH/MDH
Localiser with or without DME	250 ft
SRA (terminating at 1/2 NM)	250 ft
SRA (terminating at 1 NM)	300 ft
SRA (terminating at 2 NM or more)	350 ft
RNAV/LNAV	300 ft
VOR	300 ft
VOR/DME	250 ft
NDB	350 ft
NDB/DME	300 ft
VDF	350 ft

## (c) Criteria for establishing RVR/Converted Met Visibility (Ref Table 6)

1. In order to qualify for the lowest allowable values of RVR/CMV detailed in Table 6 (applicable to each approach grouping) the instrument approach shall meet at least the following facility requirements and associated conditions:

- (i) Instrument approaches with designated vertical profile up to and including 4,5° for Category A and B aeroplanes, or 3,77° for Category C and D aeroplanes, unless other approach angles are approved by the Authority, where the facilities are:

(A) ILS/MLS/GLS/PAR; or

(B) APV; and

where the final approach track is offset by not more than 15° for Category A and B aeroplanes or by not more than 5° for Category C and D aeroplanes.

- (ii) Instrument approaches flown using the CDFA technique with a nominal vertical profile, up to and including 4,5° for Category A and B aeroplanes, or 3,77° for Category C and D aeroplanes, unless other approach angles are approved by the Authority where the facilities are NDB, NDB/DME, VOR, VOR/DME, LLZ, LLZ/DME, VDF, SRA or RNAV/LNAV, with a final-approach segment of at least 3NM, which also fulfil the following criteria:

(A) The final approach track is offset by not more than 15° for Category A and B aeroplanes or by not more than 5° for Category C and D aeroplanes; and

(B) The FAF or another appropriate fix where descent is initiated is available, or distance to THR is available by FMS/RNAV or DME; and

(C) If the MAPt is determined by timing, the distance from FAF to THR is  $\leq 8$  NM.

- (iii) Instrument approaches where the facilities are NDB, NDB/DME, VOR, VOR/DME, LLZ, LLZ/DME, VDF, SRA or RNAV/LNAV, not fulfilling the criteria in paragraph (c)1.(ii) above, or with an MDH  $\geq 1\ 200$  ft.

2. The missed approach, after an approach has been flown using the CDFA technique, shall be executed when reaching the decision altitude (height) or the MAPt, whichever occurs first. The lateral part of the missed approach procedure must be flown via the MAPt unless otherwise stated on the approach chart.

## (d) Determination of RVR/CMV/Visibility minima for Category I, APV and non-precision approach operations

1. The minimum RVR/CMV/Visibility shall be the highest of the values derived from Table 5 or Table 6 but not greater than the maximum values shown in Table 6 where applicable

2. The values in Table 5 are derived from the formula below.

$$\text{Required RVR/visibility (m)} = [(DH/MDH \text{ (ft)} \times 0,3048)/\tan \alpha] - \text{length of approach lights (m)}$$

Note 1:  $\alpha$  is the calculation angle, being a default value of 3,00 degrees increasing in steps

3. With the approval of the Authority, the formula may be used with the actual approach slope and/or the actual length of the approach lights for a particular runway.
4. If the approach is flown with a level flight segment at or above MDA/H, 200 metres shall be added for Cat A and B aeroplane and 400 metres for Cat C and D aeroplane to the minimum RVR/CMV value resulting from the application of Tables 5 and 6.

Note: The added value corresponds to the time/distance required to establish the aeroplane on the final descent.

5. An RVR of less than 750 m as indicated in Table 5 may be used:
- (i) for Category I approach operations to runways with FALS (see below), Runway Touchdown Zone Lights (RTZL) and Runway Centreline Lights (RCLL) provided that the DH is not more than 200 ft; or
  - (ii) for Category I approach operations to runways without RTZL and RCLL when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach or flight-director-flown approach to a DH equal to or greater than 200 ft. The ILS must not be promulgated as a restricted facility; or
  - (iii) for APV approach operations to runways with FALS, RTZL and RCLL when using an approved HUD.
6. The Authority may approve RVR values lower than those given in Table 5, for HUDLS and auto-land operations in accordance with paragraph (e) of this Appendix.
7. The visual aids comprise standard runway day markings and approach and runway lighting (runway edge lights, threshold lights, runway end lights and in some cases also touch-down zone and/or runway centre line lights). The approach light configurations acceptable are classified and listed in Table 4 below.
8. Notwithstanding the requirements in paragraph (d)7. above, the authority may approve that RVR values relevant to a Basic Approach Lighting System (BALS) are used on runways where the approach lights are restricted in length below 210m due to terrain or water, but where at least one cross-bar is available.
9. For night operations or for any operation where credit for runway and approach lights is required, the lights must be on and serviceable except as provided for in Table 6a.

Table 4

**Approach light systems**

OPS Class of Facility	Length, configuration and intensity of approach lights
FALS (full approach light system)	ICAO: Precision approach CAT I Lighting System (HIALS 720 m $\geq$ ) distance coded centreline, Barrette centreline
IALS (intermediate approach light system)	ICAO: Simple approach lighting system (HIALS 420-719 m) single source, Barrette
BALS (basic approach light system)	Any other approach lighting System (HIALS, MIALS or ALS 210-419 m)
NALS (no approach light system)	Any other approach lighting system (HIALS, MIALS or ALS < 210 m) or no approach lights

Table 5

**RVR/CMV (See Table 11) v. DH/MDH**

DH or MDH			Class of Lighting Facility			
			FALS	IALS	BALS	NALS
			See paragraphs (d)5, (d)6 and (d)10 about RVR < 750 m			
Feet			Metres			
200	—	210	550	750	1 000	1 200
211	—	220	550	800	1 000	1 200
221	—	230	550	800	1 000	1 200
231	—	240	550	800	1 000	1 200
241	—	250	550	800	1 000	1 300
251	—	260	600	800	1 100	1 300
261	—	280	600	900	1 100	1 300
281	—	300	650	900	1 200	1 400
301	—	320	700	1 000	1 200	1 400
321	—	340	800	1 100	1 300	1 500
341	—	360	900	1 200	1 400	1 600
361	—	380	1 000	1 300	1 500	1 700
381	—	400	1 100	1 400	1 600	1 800
401	—	420	1 200	1 500	1 700	1 900
421	—	440	1 300	1 600	1 800	2 000
441	—	460	1 400	1 700	1 900	2 100
461	—	480	1 500	1 800	2 000	2 200
481		500	1 500	1 800	2 100	2 300
501	—	520	1 600	1 900	2 100	2 400
521	—	540	1 700	2 000	2 200	2 400
541	—	560	1 800	2 100	2 300	2 500
561	—	580	1 900	2 200	2 400	2 600
581	—	600	2 000	2 300	2 500	2 700
601	—	620	2 100	2 400	2 600	2 800
621	—	640	2 200	2 500	2 700	2 900
641	—	660	2 300	2 600	2 800	3 000
661	—	680	2 400	2 700	2 900	3 100
681	—	700	2 500	2 800	3 000	3 200
701	—	720	2 600	2 900	3 100	3 300
721	—	740	2 700	3 000	3 200	3 400
741	—	760	2 700	3 000	3 300	3 500
761	—	800	2 900	3 200	3 400	3 600
801	—	850	3 100	3 400	3 600	3 800
851	—	900	3 300	3 600	3 800	4 000
901	—	950	3 600	3 900	4 100	4 300
951	—	1 000	3 800	4 100	4 300	4 500
1 001	—	1 100	4 100	4 400	4 600	4 900
1 101	—	1 200	4 600	4 900	5 000	5 000
1 201 and above			5 000	5 000	5 000	5 000

Table 6

**Minimum and maximum applicable RVR/converted met visibility (see Table 11) for all instrument approaches down to CAT I minima (lower and upper cut-off limits):**

Facility/conditions	RVR/CMV (m)	Aeroplane category			
		A	B	C	D
ILS, MLS, GLS, PAR and APV	Min	According to Table 5			
	Max	1 500	1 500	2 400	2 400
NDB, NDB/DME, VOR, VOR/DME, LLZ, LLZ/DME, VDF, SRA, RNAV/LNAV with a procedure which fulfils the criteria in paragraph (c)1.(ii):	Min	750	750	750	750
	Max	1 500	1 500	2 400	2 400
For NDB, NDB/DME, VOR, VOR/DME, LLZ, LLZ/DME, VDF, SRA, RNAV/LNAV:	Min	1 000	1 000	1 200	1 200
— not fulfilling the criteria in paragraph (c)1.(ii) above, or	Max	According to Table 5 if flown using the CDFA technique, otherwise an add-on of 200/400 m applies to the values in Table 5 but not to result in a value exceeding 5 000 m.			
— with a DH or MDH $\geq$ 1 200 ft					

Table 6a

**Failed or downgraded equipment — effect on landing minima:**

Failed or downgraded equipment (Note 1)	Effect on landing minima				
	CAT IIIB (Note 2)	CAT IIIA	CAT II	CAT I	Non precision
ILS stand-by transmitter	Not allowed		No effect		
Outer Marker	No effect if replaced by published equivalent position				Not applicable
Middle marker	No effect				No effect unless used as MAPT
Touchdown zone RVR assessment system	May be temporarily replaced with midpoint RVR if approved by the State of the aerodrome. RVR may be reported by human observation			No effect	
Midpoint or stopend RVR	No effect				
Anemometer for runway in use	No effect if other ground source available				
Celiometer	No effect				
Approach lights	Not allowed for operations with DH > 50 ft		Not allowed	minima as for nil facilities	
Approach lights except the last 210 m	No effect		Not allowed	minima as for nil facilities	
Approach lights except the last 420 m	No effect			minima as for intermediate facilities	

Failed or downgraded equipment (Note 1)	Effect on landing minima				
	CAT IIIB (Note 2)	CAT IIIA	CAT II	CAT I	Non precision
Standby power for approach lights	No effect				
Whole runway light system	Not allowed			Day — minima as for nil facilities Night — Not allowed	
Edge lights	Day only; Night — not allowed				
Centreline lights	Day — RVR 300m Night — not allowed		Day — RVR 300 m Night — 550 m	No effect	
Centreline lights spacing increased to 30 m	RVR 150m	No effect			
Touchdown zone lights	Day — RVR 200 m Night — 300 m	Day — RVR 300 m Night — 550 m		No effect	
Standby power for runway lights	Not allowed			No effect	
Taxiway light system	No effect — except delays due to reduced movement rate				

Note 1: Conditions applicable to Table 6a:

- (a) multiple failures of runway lights other than indicated in Table 6a are not acceptable.
- (b) deficiencies of approach and runway lights are treated separately.
- (c) Category II or III operations. A combination of deficiencies in runway lights and RVR assessment equipment is not allowed.
- (d) failures other than ILS affect RVR only and not DH.

Note 2: For CAT IIIB operations with no DH, an operator shall ensure that, for aeroplanes authorised to conduct no DH operations with the lowest RVR limitations, the following applies in addition to the content of Table 6a:

- (a) RVR. At least one RVR value must be available at the aerodrome;
- (b) runway lights
  - (i) no runway edge lights, or no centre lights — Day — RVR 200 m; night — not allowed;
  - (ii) no TDZ lights — no restrictions;
  - (iii) no standby power to runway lights — Day — RVR 200 m; night — not allowed.

10. Single pilot operations. For single pilot operations, an operator must calculate the minimum RVR/visibility for all approaches in accordance with OPS 1.430 and this Appendix.

- (i) An RVR of less than 800 metres as indicated in Table 5 may be used for Category I approaches provided any of the following is used at least down to the applicable DH:

(A) a suitable autopilot, coupled to an ILS or MLS which is not promulgated as restricted; or

(B) an approved HUDLS (including, where appropriate, EVS), or equivalent approved system.

- (ii) Where RTZL and/or RCLL are not available, the minimum RVR/CMV shall not be less than 600 m.

- (iii) An RVR of less than 800 metres as indicated in Table 5 may be used for APV operations to runways with FALS, RTZL and RCLL when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach to a DH equal to or greater than 250 ft.

## (e) Lower than Standard Category I Operations

## 1. Decision height.

A lower than Standard Category I Operation decision height must not be lower than:

- (i) the minimum decision height specified in the AFM, if stated; or
- (ii) the minimum height to which the precision approach aid can be used without the required visual reference; or
- (iii) the OCH for the category of aeroplane; or
- (iv) the decision height to which the flight crew is authorised to operate; or
- (v) 200 ft.

whichever is higher.

## 2. Type of facility.

An ILS/MLS which supports a lower than Standard Category I operation must be an unrestricted facility with a straight-in course ( $\leq 3^\circ$  offset) and the ILS must be certificated to:

- (i) Class I/T/1 for operations to a minimum of 450m RVR; or
- (ii) Class II/D/2 for operations to less than 450m RVR.

Single ILS facilities are only acceptable if Level 2 performance is provided.

## 3. Required RVR/CMV.

The lowest minima to be used by an operator for lower than Standard Category I operations are stipulated in Table 6b below:

Table 6b  
**Lower than Standard Category I Minimum RVR/CMV v. approach light system**

Lower than Standard Category I minima						
DH(ft)			Class of lighting facility			
			FALS	IALS	BALS	NALS
			RVR/CMV (metres)			
200	—	210	400	500	600	750
211	—	220	450	550	650	800
221	—	230	500	600	700	900
231	—	240	500	650	750	1 000
241	—	249	550	700	800	1 100

Note 1: The visual aids comprise standard runway day markings, approach lighting, runway edge lights, threshold lights, runway end lights and, for operations below 450m, shall include touch-down zone and/or runway centre line lights.

- 4. Visual reference. A pilot shall not continue an approach below decision height unless visual reference containing a segment of at least three consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting cross-bar or the landing threshold or a barrette of the touchdown zone lighting unless the operation is conducted utilising an approved HUDLS usable to at least 150 ft.

## 5. Approval.

To conduct lower than Standard Category I operations:

- (i) the approach shall be flown auto-coupled to an auto-land; or an approved HUDLS shall be used to at least 150 ft above the threshold.
- (ii) the aeroplane shall be certificated in accordance with CS-AWO to conduct Category II operations;
- (iii) the auto-land system shall be approved for Category IIIA operations;
- (iv) in service proving requirements shall be completed in accordance with Appendix 1 to OPS 1.440 paragraph (h);
- (v) training specified in Appendix 1 to OPS 1.450 paragraph (h) shall be completed, this shall include training and checking in a Flight Simulator using the appropriate ground and visual aids at the lowest applicable RVR;
- (vi) the Operator must ensure that Low Visibility procedures are established and in operation at the intended aerodrome of landing; and
- (vii) the Operator shall be approved by the Authority.

## (f) Precision approach — Category II and other than Standard Category II operations

## 1. General.

- (i) A Category II operation is a precision instrument approach and landing using ILS or MLS with:
  - (A) A decision height below 200 ft but not lower than 100 ft; and
  - (B) A runway visual range of not less than 300 m.
- (ii) An other than Standard Category II operation is a precision instrument approach and landing using ILS or MLS which meets facility requirements as established in paragraph (iii) below with:
  - (A) A decision height below 200 ft but not lower than 100 ft; (See Table 7b below) and
  - (B) A runway visual range of not less than 350/400 m. (See Table 7b below)
- (iii) The ILS/MLS that supports other than a Standard Category II operation shall be an unrestricted facility with a straight in course ( $\leq 3^\circ$  offset) and the ILS shall be certificated to:
  - (A) Class I/T/1 for operations down to 450m RVR and to a DH of 200 ft or more; or,
  - (B) Class II/D/2 for operations in RVRs of less than 450m or to a DH of less than 200 ft.

Single ILS facilities are only acceptable if Level 2 performance is provided.

## 2. Decision Height. An operator must ensure that the decision height for:

- (i) Other than Standard Category II and Category II operations is not lower than:
  - (A) The minimum decision height specified in the AFM, if stated; or
  - (B) The minimum height to which the precision approach aid can be used without the required visual reference; or
  - (C) The OCH for the category of aeroplane; or
  - (D) The decision height to which the flight crew is authorised to operate; or
  - (E) 100 ft.

whichever is higher.

3. Visual reference. A pilot may not continue an approach below either the Category II or the other than Standard Category II decision height determined in accordance with subparagraph (d)2. above unless visual reference containing a segment of at least 3 consecutive lights being the centre line of the approach lights, or touchdown zone lights, or runway centre line lights, or runway edge lights, or a combination of these is attained and can be maintained. This visual reference must include a lateral element of the ground pattern, i.e. an approach lighting cross-bar or the landing threshold or a barrette of the touchdown zone lighting unless the operation is conducted utilising an approved HUDLS to touchdown.
4. (i) Required RVR. The lowest minima to be used by an operator for Category II operations are:

Table 7a

**RVR for Cat II operations v. DH**

Category II minima		
DH(ft)	Auto-coupled/Approved HUDLS to below DH (Note 1a)	
	RVR Aeroplane Category A, B and C	RVR Aeroplane Category D
100-120	300 m	300/350m (Note 2a)
121-140	400 m	400 m
141 and above	450 m	450m

Note 1a: The reference to "auto-coupled to below DH/Approved HUDLS" in this table means continued use of the automatic flight control system or the HUDLS down to a height of 80 % of the DH. Thus airworthiness requirements may, through minimum engagement height for the automatic flight control system, affect the DH to be applied.

Note 2a: 300 m may be used for a Category D aeroplane conducting an auto-land.

- (ii) Required RVR. The lowest minima to be used by an operator for other than Standard Category II operations are:

Table 7b

**Other than Standard Category II Minimum RVR v. approach light system**

Other than Standard Category II minima					
	Auto-land or approved HUDLS utilised to touchdown				
	Class of lighting facility				
	FALS		IALS	BALS	NALS
	See para (d)5., (d)6. and (d)10. about RVR < 750m				
	CAT A-C	CAT D	CAT A-D	CAT A-D	CAT A-D
DH (ft)	RVR metres				
100-120	350	400	450	600	700
121-140	400	450	500	600	700
141-160	450	500	500	600	750
161-199	450	500	550	650	750

Note: The visual aids required to conduct other than Standard Category II Operations comprise standard runway day markings and approach and runway lighting (runway edge lights, threshold lights, runway end lights). For operations in RVR of 400 m or less, centre line lights must be available. The approach light configurations are classified and listed in Table 4 above.



- (iii) To conduct other than Standard Category II operations the operator must ensure that appropriate low visibility procedures are established and in operation at the intended aerodrome of landing.

(g) Precision approach — Category III operations

1. General. Category III operations are subdivided as follows:

- (i) Category III A operations. A precision instrument approach and landing using ILS or MLS with:

- (A) a decision height lower than 100 ft; and
- (B) a runway visual range not less than 200 m.

- (ii) Category III B operations. A precision instrument approach and landing using ILS or MLS with:

- (A) a decision height lower than 100 ft, or no decision height; and
- (B) a runway visual range lower than 200 m but not less than 75 m.

*Note:* Where the decision height (DH) and runway visual range (RVR) do not fall within the same Category, the RVR will determine in which Category the operation is to be considered.

2. Decision height. For operations in which a decision height is used, an operator must ensure that the decision height is not lower than:

- (i) the minimum decision height specified in the AFM, if stated; or
- (ii) the minimum height to which the precision approach aid can be used without the required visual reference; or
- (iii) the decision height to which the flight crew is authorised to operate.

3. No decision height operations. Operations with no decision height may only be conducted if:

- (i) the operation with no decision height is authorised in the AFM; and
- (ii) the approach aid and the aerodrome facilities can support operations with no decision height; and
- (iii) the operator has an approval for CAT III operations with no decision height.

*Note:* In the case of a CAT III runway it may be assumed that operations with no decision height can be supported unless specifically restricted as published in the AIP or NOTAM.

4. Visual reference

- (i) For Category IIIA operations, and for Category IIIB operations conducted either with fail-passive flight control systems, or with the use of an approved HUDLS, a pilot may not continue an approach below the decision height determined in accordance with subparagraph (g)2. above unless a visual reference containing a segment of at least three consecutive lights being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of these is attained and can be maintained.
- (ii) For Category IIIB operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system (comprising e.g. a HUDLS) using a decision height a pilot may not continue an approach below the decision height, determined in accordance with subparagraph (e)2. above, unless a visual reference containing at least one centreline light is attained and can be maintained.

5. Required RVR. The lowest minima to be used by an operator for Category III operations are:

Table 8

**RVR for Cat III Operations v. DH and roll-out control/guidance system**

Category III minima			
Category	Decision height (ft) (Note 2)	Roll-out control/Guidance system	RVR (m)
IIIA	Less than 100 ft	Not required	200 m
IIIB	Less than 100 ft	Fail-passive	150 m (Note 1)
IIIB	Less than 50 ft	Fail-passive	125 m
IIIB	Less than 50 ft or No decision height	Fail-operational (Note 3)	75 m

Note 1: For aeroplanes certificated in accordance with CS-AWO 321(b)3, or equivalent.

Note 2: Flight control system redundancy is determined under CS-AWO by the minimum certificated decision height.

Note 3: The fail-operational system referred to may consist of a fail-operational hybrid system.

## (h) Enhanced vision systems

1. A pilot using an enhanced vision system certificated for the purpose of this paragraph and used in accordance with the procedures and limitations of the approved flight manual, may:
  - (i) continue an approach below DH or MDH to 100 feet above the threshold elevation of the runway provided that at least one of the following visual references is displayed and identifiable on the enhanced vision system:
    - (A) elements of the approach lighting; or
    - (B) the runway threshold, identified by at least one of the following: the beginning of the runway landing surface, the threshold lights, the threshold identification lights; and the touchdown zone, identified by at least one of the following: the runway touchdown zone landing surface, the touchdown zone lights, the touchdown zone markings or the runway lights;
  - (ii) reduce the calculated RVR/CMV for the approach from the value in column 1 of Table 9 below to the value in column 2:

Table 9

**Approach utilising EVS RVR/CMV reduction v. normal RVR/CMV**

RVR/CMV normally required	RVR/CMV for approach utilising EVS
550	350
600	400
650	450
700	450
750	500
800	550
900	600
1 000	650
1 100	750
1 200	800
1 300	900
1 400	900
1 500	1 000
1 600	1 100
1 700	1 100

RVR/CMV normally required	RVR/CMV for approach utilising EVS
1 800	1 200
1 900	1 300
2 000	1 300
2 100	1 400
2 200	1 500
2 300	1 500
2 400	1 600
2 500	1 700
2 600	1 700
2 700	1 800
2 800	1 900
2 900	1 900
3 000	2 000
3 100	2 000
3 200	2 100
3 300	2 200
3 400	2 200
3 500	2 300
3 600	2 400
3 700	2 400
3 800	2 500
3 900	2 600
4 000	2 600
4 100	2 700
4 200	2 800
4 300	2 800
4 400	2 900
4 500	3 000
4 600	3 000
4 700	3 100
4 800	3 200
4 900	3 200
5 000	3 300

2. Paragraph (h)1. above may only be used for ILS, MLS, PAR, GLS and APV Operations with a DH no lower than 200 feet or an approach flown using approved vertical flight path guidance to a MDH or DH no lower than 250 feet.
  3. A pilot may not continue an approach below 100 feet above runway threshold elevation for the intended runway, unless at least one of the visual references specified below is distinctly visible and identifiable to the pilot without reliance on the enhanced vision system:
    - (A) The lights or markings of the threshold; or
    - (B) The lights or markings of the touchdown zone.
- (i) Intentionally left blank
- (j) Circling
1. Minimum descent height (MDH). The MDH for circling shall be the higher of:
    - (i) the published circling OCH for the aeroplane category; or

- (ii) the minimum circling height derived from Table 10 below; or
  - (iii) the DH/MDH of the preceding instrument approach procedure.
2. Minimum descent altitude (MDA). The MDA for circling shall be calculated by adding the published aerodrome elevation to the MDH, as determined by 1. above.
  3. Visibility. The minimum visibility for circling shall be the higher of:
    - (i) the circling visibility for the aeroplane category, if published; or
    - (ii) the minimum visibility derived from Table 10 below; or
    - (iii) the RVR/CMV derived from Tables 5 and 6 for the preceding instrument approach procedure.
  4. Notwithstanding the requirements in subparagraph 3. above, an Authority may exempt an operator from the requirement to increase the visibility above that derived from Table 10.
  5. Exemptions as described in subparagraph 4. must be limited to locations where there is a clear public interest to maintain current operations. The exemptions must be based on the operator's experience, training programme and flight crew qualification. The exemptions must be reviewed at regular intervals.

Table 10

**Minimum visibility and MDH for circling v. aeroplane category**

	Aeroplane Category			
	A	B	C	D
MDH (ft)	400	500	600	700
Minimum meteorological visibility (m)	1 500	1 600	2 400	3 600

2. Circling with prescribed tracks is an accepted procedure within the meaning of this paragraph.
- (k) Visual approach. An operator shall not use an RVR of less than 800 m for a visual approach.
  - (l) Conversion of reported meteorological visibility to RVR/CMV.
    1. An operator must ensure that a meteorological visibility to RVR/CMV conversion is not used for takeoff, for calculating any other required RVR minimum less than 800 m, or when reported RVR is available.
 

*Note:* If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. "RVR more than 1 500 metres", it is not considered to be a reported value for the purpose of this paragraph.
    2. When converting meteorological visibility to RVR in all other circumstances than those in subparagraph (l)1. above, an operator must ensure that the following Table is used:

Table 11

**Conversion of met visibility to RVR/CMV**

Lighting elements in operation	RVR/CMV = Reported met. Visibility ×	
	Day	Night
HI approach and runway lighting	1,5	2,0
Any type of lighting installation other than above	1,0	1,5
No lighting	1,0	Not applicable

## Appendix 2 to OPS 1.430 (c)

**Aeroplane categories — All weather operations**

## (a) Classification of aeroplanes

The criteria taken into consideration for the classification of aeroplanes by categories is the indicated airspeed at threshold (VAT) which is equal to the stalling speed (VSO) multiplied by 1,3 or VS1G multiplied by 1,23 in the landing configuration at the maximum certificated landing mass. If both VSO and VS1G are available, the higher resulting VAT shall be used. The aeroplane categories corresponding to VAT values are in the Table below:

Aeroplane Category	VAT
A	Less than 91 kt
B	From 91 to 120 kt
C	From 121 to 140 kt
D	From 141 to 165 kt
E	From 166 to 210 kt

The landing configuration which is to be taken into consideration shall be defined by the operator or by the aeroplane manufacturer.

## (b) Permanent change of category (maximum landing mass)

1. An operator may impose a permanent, lower, landing mass, and use this mass for determining the VAT if approved by the Authority.
2. The category defined for a given aeroplane shall be a permanent value and thus independent of the changing conditions of day-to-day operations.

*Appendix 1 to OPS 1.440***Low visibility operations — General operating rules**

- (a) General. The following procedures apply to the introduction and approval of low visibility operations.
- (b) Operational demonstration. The purpose of the operational demonstration is to determine or validate the use and effectiveness of the applicable aircraft flight guidance systems, including HUDLS if appropriate, training, flight crew procedures, maintenance programme, and manuals applicable to the Category II/III programme being approved.
  - 1. At least 30 approaches and landings must be accomplished in operations using the Category II/III systems installed in each aircraft type if the requested DH is 50 ft or higher. If the DH is less than 50 ft, at least 100 approaches and landings will need to be accomplished unless otherwise approved by the Authority.
  - 2. If an operator has different variants of the same type of aircraft utilising the same basic flight control and display systems, or different basic flight control and display systems on the same type of aircraft, the operator must show that the various variants have satisfactory performance, but the operator need not conduct a full operational demonstration for each variant. The Authority may also accept a reduction of the number of approach and landings based on credit given for the experience gained by another operator with an AOC issued in accordance with OPS 1 using the same aeroplane type or variant and procedures.
  - 3. If the number of unsuccessful approaches exceeds 5 % of the total (e.g. unsatisfactory landings, system disconnects) the evaluation programme must be extended in steps of at least 10 approaches and landings until the overall failure rate does not exceed 5 %.
- (c) Data collection for operational demonstrations. Each applicant must develop a data collection method (e.g. a form to be used by the flight crew) to record approach and landing performance. The resulting data and a summary of the demonstration data shall be made available to the Authority for evaluation.
- (d) Data analysis. Unsatisfactory approaches and/or automatic landings shall be documented and analysed.
- (e) Continuous monitoring
  - 1. After obtaining the initial authorisation, the operations must be continuously monitored by the operator to detect any undesirable trends before they become hazardous. Flight crew reports may be used to achieve this.
  - 2. The following information must be retained for a period of 12 months:
    - (i) the total number of approaches, by aeroplane type, where the airborne Category II or III equipment was utilised to make satisfactory, actual or practice, approaches to the applicable Category II or III minima; and
    - (ii) reports of unsatisfactory approaches and/or automatic landings, by aerodrome and aeroplane registration, in the following categories:
      - (A) airborne equipment faults;
      - (B) ground facility difficulties;
      - (C) missed approaches because of ATC instructions; or
      - (D) other reasons.
  - 3. An operator must establish a procedure to monitor the performance of the automatic landing system or HUDLS to touchdown performance, as appropriate, of each aeroplane.

- (f) Transitional periods
1. Operators with no previous Category II or III experience
    - (i) An operator without previous Category II or III operational experience may be approved for Category II or IIIA operations, having gained a minimum experience of six months of Category I operations on the aeroplane type.
    - (ii) On completing six months of Category II or IIIA operations on the aeroplane type the operator may be approved for Category IIIB operations. When granting such an approval, the Authority may impose higher minima than the lowest applicable for an additional period. The increase in minima will normally only refer to RVR and/or a restriction against operations with no decision height and must be selected such that they will not require any change of the operational procedures.
  2.
    - (i) Operators with previous Category II or III experience. An operator with previous Category II or III experience may obtain authorisation for a reduced transition period by application to the Authority.
    - (ii) An operator authorised for Category II or III operations using auto-coupled approach procedures, with or without auto-land, and subsequently introducing manually flown Category II or III operations using a HUDLS shall be considered to be a "New Category II/III operator" for the purposes of the demonstration period provisions.
- (g) Maintenance of Category II, Category III and LVTO equipment. Maintenance instructions for the on-board guidance systems must be established by the operator, in liaison with the manufacturer, and included in the operator's aeroplane maintenance programme prescribed in Part M, paragraph M.A.302 which must be approved by the Authority.
- (h) Eligible aerodromes and runways
1. Each aeroplane type/runway combination must be verified by the successful completion of at least one approach and landing in Category II or better conditions, prior to commencing Category III operations.
  2. For runways with irregular pre-threshold terrain or other foreseeable or known deficiencies, each aeroplane type/runway combination must be verified by operations in standard Category I or better conditions, prior to commencing Lower than Standard Category I, Category II, or other than Standard Category II or Category III operations.
  3. If an operator has different variants of the same type of aeroplane in accordance with subparagraph 4 below, utilising the same basic flight control and display systems, or different basic flight control and display systems on the same type of aeroplane in accordance with subparagraph 4 below, the operator must show that the variants have satisfactory operational performance, but the operator need not conduct a full operational demonstration for each variant/runway combination.
  4. For the purpose of paragraph (h), an aeroplane type or variant of an aeroplane type is deemed to be the same type/variant of aeroplane if that type/variant has the same or similar:
    - (i) level of technology, including the:
      - (A) FGS and associated displays and controls;
      - (B) the FMS and level of integration with the FGS;
      - (C) use of HUDLS.
    - (ii) Operational procedures, including:
      - (A) alert height;
      - (B) manual landing/automatic landing;
      - (C) no decision height operations;
      - (D) use of HUD/HUDLS in hybrid operations.

- (iii) Handling characteristics, including:
    - (A) manual landing from automatic or HUDLS guided approach;
    - (B) manual go-around from automatic approach;
    - (C) automatic/manual roll out.
  - 5. Operators using the same aeroplane type/class or variant of a type in accordance with subparagraph 4 above may take credit from each others' experience and records in complying with this paragraph.
  - 6. Operators conducting Other than Standard Category II operations shall comply with Appendix 1 to OPS 1.440 — Low Visibility Operations — General Operating Rules applicable to Category II operations.
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## Appendix 1 to OPS 1.450

**Low visibility operations — Training and qualifications**

- (a) General: An operator must ensure that flight crew member training programmes for low visibility operations include structured courses of ground, flight simulator and/or flight training. The operator may abbreviate the course content as prescribed by subparagraphs 2 and 3 below provided the content of the abbreviated course is acceptable to the authority.
1. Flight crew members with no Category II or Category III experience must complete the full training programme prescribed in subparagraphs (b), (c) and (d) below.
  2. Flight crew members with Category II or Category III experience with a similar type of operation (auto-coupled/auto-land, HUDLS/Hybrid HUDLS or EVS) or Category II with manual land if appropriate with another Community operator may undertake an:
    - (i) abbreviated ground training course if operating a different type/class from that on which the previous Category II or Category III experience was gained;
    - (ii) abbreviated ground, flight simulator and/or flight training course if operating the same type/class and variant of the same type or class on which the previous Category II or Category III experience was gained. The abbreviated course is to include at least the requirements of subparagraphs (d)1, (d)2(i) or (d)2(ii) as appropriate and (d)3(i). With the approval of the Authority, the operator may reduce the number of approaches/landings required by subparagraph (d)2(i) if the type/class or the variant of the type or class has the same or similar:
      - (A) level of technology — flight control/guidance system (FGS); and
      - (B) operational procedures;
      - (C) handling characteristics (See paragraph 4 below);

as the previously operated type or class, otherwise the requirement of (d)2(i) has to be met in full;

    - (D) use of HUDLS/hybrid HUDLS;
    - (E) use of EVS.
3. Flight crew members with Category II or Category III experience with the operator may undertake an abbreviated ground, Flight simulator and/or flight training course.

The abbreviated course when changing:

- (i) aeroplane type/class is to include at least the requirements of subparagraphs (d)1, (d)2(i) or (d)2(ii) as appropriate and (d)3(i);
- (ii) to a different variant of aeroplane within the same type or class rating that has the same or similar:
  - (A) level of technology — flight control/guidance system (FGS); and
  - (B) operational procedures — integrity;
  - (C) handling characteristics (See paragraph 4 below);
  - (D) use of HUDLS/Hybrid HUDLS;
  - (E) use of EVS

as the previously operated type or class, then a difference course or familiarisation appropriate to the change of variant fulfils the abbreviated course requirements;

- (iii) to a different variant of aeroplane within the same type or class rating that has a significantly different:
  - (A) level of technology — flight control/guidance system (FGS); and
  - (B) operational procedures — integrity;
  - (C) handling characteristics (See paragraph 4 below);
  - (D) use of HUDLS/Hybrid HUDLS;
  - (E) use of EVS

then the requirements of subparagraphs (d)1, (d)2(i) or (d)2(ii) as appropriate and (d)3(i) shall be fulfilled. With the approval of the Authority the operator may reduce the number of approaches/landings required by subparagraph (d)2(i).
- 4. An operator must ensure when undertaking Category II or Category III operations with different variant(s) of aeroplane within the same type or class rating that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account at least the following:
  - (i) the level of technology, including the:
    - (A) FGS and associated displays and controls;
    - (B) the Flight Management System and its integration or not with the FGS;
    - (C) use of HUD/HUDLS with hybrid systems and/or EVS;
  - (ii) operational procedures, including:
    - (A) fail-passive/fail-operational, alert height;
    - (B) manual landing/automatic landing;
    - (C) no decision height operations;
    - (D) use of HUD/HUDLS with hybrid systems;
  - (iii) handling characteristics, including:
    - (A) manual landing from automatic HUDLS and/or EVS guided approach;
    - (B) manual go-around from automatic approach;
    - (C) automatic/manual roll out.
- (b) Ground training. An operator must ensure that the initial ground training course for low visibility operations covers at least:
  - 1. the characteristics and limitations of the ILS and/or MLS;
  - 2. the characteristics of the visual aids;
  - 3. the characteristics of fog;
  - 4. the operational capabilities and limitations of the particular airborne system to include HUD symbology and EVS characteristics if appropriate;
  - 5. the effects of precipitation, ice accretion, low level wind shear and turbulence;
  - 6. the effect of specific aeroplane/system malfunctions;

7. the use and limitations of RVR assessment systems;
  8. the principles of obstacle clearance requirements;
  9. recognition of and action to be taken in the event of failure of ground equipment;
  10. the procedures and precautions to be followed with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m (200 m for Category D aeroplanes);
  11. the significance of decision heights based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on the automatic approach/landing systems;
  12. the importance and significance of alert height if applicable and the action in the event of any failure above and below the alert height;
  13. the qualification requirements for pilots to obtain and retain approval to conduct low visibility take-offs and Category II or III operations; and
  14. the importance of correct seating and eye position.
- (c) Flight simulator training and/or flight training
1. An operator must ensure that flight simulator and/or flight training for low visibility operations includes:
    - (i) checks of satisfactory functioning of equipment, both on the ground and in flight;
    - (ii) effect on minima caused by changes in the status of ground installations;
    - (iii) monitoring of:
      - (A) automatic flight control systems and auto land status annunciators with emphasis on the action to be taken in the event of failures of such systems; and
      - (B) HUD/HUDLS/EVS guidance status and annunciators as appropriate, to include head down displays;
    - (iv) actions to be taken in the event of failures such as engines, electrical systems, hydraulics or flight control systems;
    - (v) the effect of known unserviceabilities and use of minimum equipment lists;
    - (vi) operating limitations resulting from airworthiness certification;
    - (vii) guidance on the visual cues required at decision height together with information on maximum deviation allowed from glide path or localiser; and
    - (viii) the importance and significance of alert height if applicable and the action in the event of any failure above and below the alert height.
  2. An operator must ensure that each flight crew member is trained to carry out his/her duties and instructed on the coordination required with other crew members. Maximum use should be made of flight simulators.
  3. Training must be divided into phases covering normal operation with no aeroplane or equipment failures but including all weather conditions which may be encountered and detailed scenarios of aeroplane and equipment failure which could affect Category II or III operations. If the aeroplane system involves the use of hybrid or other special systems (such as HUD/HUDLS or enhanced vision equipment) then flight crew members must practise the use of these systems in normal and abnormal modes during the flight simulator phase of training.

4. Incapacitation procedures appropriate to low visibility take-offs and Category II and III operations shall be practised.
5. For aeroplanes with no flight simulator available to represent that specific aeroplane operators must ensure that the flight training phase specific to the visual scenarios of Category II operations is conducted in a specifically approved flight simulator. Such training must include a minimum of four approaches. The training and procedures that are type specific shall be practised in the aeroplane.
6. Initial Category II and III training shall include at least the following exercises:
  - (i) approach using the appropriate flight guidance, autopilots and control systems installed in the aeroplane, to the appropriate decision height and to include transition to visual flight and landing;
  - (ii) approach with all engines operating using the appropriate flight guidance systems, autopilots, HUDLS and/or EVS and control systems installed in the aeroplane down to the appropriate decision height followed by missed approach; all without external visual reference;
  - (iii) where appropriate, approaches utilising automatic flight systems to provide automatic flare, landing and roll-out; and
  - (iv) normal operation of the applicable system both with and without acquisition of visual cues at decision height.
7. Subsequent phases of training must include at least:
  - (i) approaches with engine failure at various stages on the approach;
  - (ii) approaches with critical equipment failures (e.g. electrical systems, auto flight systems, ground and/or airborne ILS/MLS systems and status monitors);
  - (iii) approaches where failures of auto flight equipment and/or HUD/HUDLS/EVS at low level require either:
    - (A) reversion to manual flight to control flare, landing and roll out or missed approach; or
    - (B) reversion to manual flight or a downgraded automatic mode to control missed approaches from, at or below decision height including those which may result in a touchdown on the runway;
  - (iv) failures of the systems which will result in excessive localiser and/or glide slope deviation, both above and below decision height, in the minimum visual conditions authorised for the operation. In addition, a continuation to a manual landing must be practised if a head-up display forms a downgraded mode of the automatic system or the head-up display forms the only flare mode; and
  - (v) failures and procedures specific to aeroplane type or variant.
8. The training programme must provide practice in handling faults which require a reversion to higher minima.
9. The training programme must include the handling of the aeroplane when, during a fail passive Category III approach, the fault causes the autopilot to disconnect at or below decision height when the last reported RVR is 300 m or less.
10. Where take-offs are conducted in RVRs of 400 m and below, training must be established to cover systems failures and engine failure resulting in continued as well as rejected take-offs.
11. The training programme must include, where appropriate, approaches where failures of the HUDLS and/or EVS equipment at low level require either:
  - (i) reversion to head down displays to control missed approach; or
  - (ii) reversion to flight with no, or downgraded, HUDLS Guidance to control missed approaches from decision height or below, including those which may result in a touchdown on the runway.

12. An operator shall ensure that when undertaking low visibility take-off, lower than Standard Category I, other than Standard Category II, and Category II and III Operations utilising a HUD/HUDLS or hybrid HUD/HUDLS or an EVS, that the training and checking programme includes, where appropriate, the use of the HUD/HUDLS in normal operations during all phases of flight.
- (d) Conversion training requirements to conduct low visibility take-off, lower than Standard Category I, other than Standard Category II, approach utilising EVS and Category II and III Operations. An operator shall ensure that each flight crew member completes the following low visibility procedures training if converting to a new type/class or variant of aeroplane in which low visibility take-off, lower than Standard Category I, Other than Standard Category II, Approach utilising EVS with an RVR of 800m or less and Category II and III Operations will be conducted. The flight crew member experience requirements to undertake an abbreviated course are prescribed in subparagraphs (a)2, (a)3 and (a)4, above:
1. Ground Training. The appropriate requirements prescribed in subparagraph (b) above, taking into account the flight crew member's Category II and Category III training and experience.
  2. Flight simulator training and/or flight training.
    - (i) A minimum of six (eight for HUDLS with or without EVS) approaches and/or landings in a flight simulator. The requirements for eight HUDLS approaches may be reduced to six when conducting Hybrid HUDLS operations. See subparagraph 4.(i) below.
    - (ii) Where no Flight simulator is available to represent that specific aeroplane, a minimum of three (five for HUDLS and/or EVS) approaches including at least one go-around is required on the aeroplane. For Hybrid HUDLS operations a minimum of three approaches are required, including at least one go-around.
    - (iii) Appropriate additional training if any special equipment is required such as head-up displays or enhanced vision equipment. When approach operations utilising EVS are conducted with an RVR of less than 800m, a minimum of five approaches, including at least one go-around are required on the aeroplane.
  3. Flight crew qualification. The flight crew qualification requirements are specific to the operator and the type of aeroplane operated.
    - (i) The operator must ensure that each flight crew member completes a check before conducting Category II or III operations.
    - (ii) The check prescribed in subparagraph (i) above may be replaced by successful completion of the flight simulator and/or flight training prescribed in subparagraph (d)2. above.
  4. Line flying under supervision. An operator must ensure that each flight crew member undergoes the following line flying under supervision (LIFUS):
    - (i) for Category II when a manual landing or a HUDLS approach to touchdown is required, a minimum of:
      - (A) three landings from autopilot disconnect;
      - (B) four landings with HUDLS used to touchdown;

except that only one manual landing (two using HUDLS to touchdown) is required when the training required in subparagraph (d)2 above has been carried out in a flight simulator qualified for zero flight time conversion.
    - (ii) For Category III, a minimum of two auto lands except that:
      - (A) only 1 autoland is required when the training required in subparagraph (d)2. above has been carried out in a flight simulator qualified for zero flight time conversion;
      - (B) no autoland is required during LIFUS when the training required in subparagraph (d)2 above has been carried out in a flight simulator qualified for zero flight time (ZFT) conversion and the flight crew member successfully completed the ZFT type rating conversion course;

- (C) the flight crew member, trained and qualified in accordance with paragraph (B) above, is qualified to operate during the conduct of LIFUS to the lowest approved DA(H) and RVR as stipulated in the Operations Manual.
- (iii) For Category III approaches using HUDLS to touchdown a minimum of four approaches.
- (e) Type and command experience.
  - 1. Before commencing Category II operations, the following additional requirements are applicable to commanders, or pilots to whom conduct of the flight may be delegated, who are new to the aeroplane type/class:
    - (i) 50 hours or 20 sectors on the type, including line flying under supervision; and
    - (ii) 100 m must be added to the applicable Category II RVR minima when the operation requires a Category II manual landing or use of HUDLS to touchdown until:
      - (A) a total of 100 hours or 40 sectors, including LIFUS has been achieved on the type; or
      - (B) a total of 50 hours or 20 sectors, including LIFUS has been achieved on the type where the flight crew member has been previously qualified for Category II manual landing operations with a Community operator;
    - (C) for HUDLS operations the sector requirements in paragraphs (e) 1. and (e) 2. (i) shall always be applicable, the hours on type/class does not fulfil the requirement.
  - 2. Before commencing Category III operations, the following additional requirements are applicable to commanders, or pilots to whom conduct of the flight may be delegated, who are new to the aeroplane type:
    - (i) 50 hours or 20 sectors on the type, including line flying under supervision; and
    - (ii) 100 m must be added to the applicable Category II or Category III RVR minima unless he has previously qualified for Category II or III operations with a Community operator, until a total of 100 hours or 40 sectors, including line flying under supervision, has been achieved on the type.
  - 3. The Authority may authorise a reduction in the above command experience requirements for flight crew members who have Category II or Category III command experience.
- (f) Low visibility take-off with RVR less than 150/200 m
  - 1. An operator must ensure that prior to authorisation to conduct take-offs in RVRs below 150 m (below 200 m for Category D aeroplanes) the following training is carried out:
    - (i) normal take-off in minimum authorised RVR conditions;
    - (ii) take-off in minimum authorised RVR conditions with an engine failure between V1 and V2, or as soon as safety considerations permit; and
    - (iii) take-off in minimum authorised RVR conditions with an engine failure before V1 resulting in a rejected take-off.
  - 2. An operator must ensure that the training required by subparagraph 1 above is carried out in a flight simulator. This training must include the use of any special procedures and equipment. Where no flight simulator is available to represent that specific aeroplane, the Authority may approve such training in an aeroplane without the requirement for minimum RVR conditions (See Appendix 1 to OPS 1.965).
  - 3. An operator must ensure that a flight crew member has completed a check before conducting low visibility take-offs in RVRs of less than 150 m (less than 200 m for Category D aeroplanes) if applicable. The check may only be replaced by successful completion of the flight simulator and/or flight training prescribed in subparagraph (f)1. on conversion to an aeroplane type.

## (g) Recurrent training and checking — Low visibility operations

1. An operator must ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation, for which he/she is authorised is checked. The required number of approaches to be undertaken in the flight simulator within the validity period of the operators proficiency check (as prescribed in OPS 1.965 (b)) is to be a minimum of two, (four when HUDLS and/or EVS is utilised to touchdown) one of which must be a landing at the lowest approved RVR; in addition one (two for HUDLS and/or operations utilising EVS) of these approaches may be substituted by an approach and landing in the aeroplane using approved Category II and III procedures. One missed approach shall be flown during the conduct of the operators proficiency check. If the operator is authorised to conduct take-off with RVR less than 150/200 m at least one LVTO to the lowest applicable minima shall be flown during the conduct of the operators proficiency check.
2. For Category III operations an operator must use a flight simulator.
3. An operator must ensure that, for Category III operations on aeroplanes with a fail passive flight control system, including HUDLS, a missed approach is completed at least once over the period of three consecutive operator proficiency checks as the result of an autopilot failure at or below decision height when the last reported RVR was 300 m or less.
4. The Authority may authorise recurrent training and checking for Category II and LVTO operations in an aeroplane type where no flight simulator to represent that specific aeroplane or an acceptable alternate is available.

*Note:* Recency for LTVO and Category II/III based upon automatic approaches and/or auto-lands is maintained by the recurrent training and checking as prescribed in this paragraph.

## (h) Additional training requirements for operators conducting lower than Standard Category I, approaches utilising EVS and other than Standard Category II Operations.

1. Operators conducting lower than Standard Category I operations shall comply with the requirements of Appendix 1 to OPS 1.450 — low visibility operations — training and qualifications applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be additional to the requirements of OPS Subpart N provided the training is conducted utilising the lowest applicable RVR. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach using lower than Standard Category I minima is conducted at least once every 18 months.
2. Operators conducting other than Standard Category II operations shall comply with the requirements of Appendix 1 to OPS 1.450 — low visibility operations — training and qualifications applicable to Category II operations to include the requirements applicable to HUDLS (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD/HUDLS. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach using other than Standard Category II minima is conducted at least once every 18 months.
3. Operators conducting approach operations utilising EVS with RVR of 800 m or less shall comply with the requirements of Appendix 1 to OPS 1.450 — Low Visibility Operations — Training and Qualifications applicable to Category II operations to include the requirements applicable to HUD (if appropriate). The operator may combine these additional requirements where appropriate provided that the operational procedures are compatible. During conversion training the total number of approaches required shall not be less than that required to complete Category II training utilising a HUD. During recurrent training and checking the operator may also combine the separate requirements provided the above operational procedure requirement is met, provided that at least one approach utilising EVS is conducted at least once every 12 months.

*Appendix 1 to OPS 1.455***Low visibility operations — Operating procedures**

## (a) General. Low visibility operations include:

1. manual take-off (with or without electronic guidance systems or HUDLS/Hybrid HUD/HUDLS);
2. auto-coupled approach to below DH, with manual flare, landing and roll-out;
3. approach flown with the use of a HUDLS/Hybrid HUD/HUDLS and/or EVS);
4. auto-coupled approach followed by auto-flare, auto landing and manual roll-out; and
5. auto-coupled approach followed by auto-flare, auto landing and auto-roll-out, when the applicable RVR is less than 400 m.

*Note 1:* A hybrid system may be used with any of these modes of operations.

*Note 2:* Other forms of guidance systems or displays may be certificated and approved.

## (b) Procedures and operating instructions

1. The precise nature and scope of procedures and instructions given depend upon the airborne equipment used and the flight deck procedures followed. An operator must clearly define flight crew member duties during take-off, approach, flare, roll-out and missed approach in the Operations Manual. Particular emphasis must be placed on flight crew responsibilities during transition from non-visual conditions to visual conditions, and on the procedures to be used in deteriorating visibility or when failures occur. Special attention must be paid to the distribution of flight deck duties so as to ensure that the workload of the pilot making the decision to land or execute a missed approach enables him/her to devote himself/herself to supervision and the decision making process.
2. An operator must specify the detailed operating procedures and instructions in the Operations Manual. The instructions must be compatible with the limitations and mandatory procedures contained in the Aeroplane Flight Manual and cover the following items in particular:
  - (i) checks for the satisfactory functioning of the aeroplane equipment, both before departure and in flight;
  - (ii) effect on minima caused by changes in the status of the ground installations and airborne equipment;
  - (iii) procedures for the take-off, approach, flare, landing, roll-out and missed approach;
  - (iv) procedures to be followed in the event of failures, warnings to include HUD/HUDLS/EVS and other non-normal situations;
  - (v) the minimum visual reference required;
  - (vi) the importance of correct seating and eye position;
  - (vii) action which may be necessary arising from a deterioration of the visual reference;
  - (viii) allocation of crew duties in the carrying out of the procedures according to subparagraphs (i) to (iv) and (vi) above, to allow the Commander to devote himself/herself mainly to supervision and decision making;
  - (ix) the requirement for all height calls below 200 ft to be based on the radio altimeter and for one pilot to continue to monitor the aeroplane instruments until the landing is completed;
  - (x) the requirement for the Localiser Sensitive Area to be protected;
  - (xi) the use of information relating to wind velocity, wind shear, turbulence, runway contamination and use of multiple RVR assessments;



- (xii) procedures to be used for:
    - (A) lower than Standard Category I;
    - (B) other than Standard Category II;
    - (C) approaches utilising EVS; and
    - (D) practice approaches and landing on runways at which the full Category II or Category III aerodrome procedures are not in force;
  - (xiii) operating limitations resulting from airworthiness certification; and
  - (xiv) information on the maximum deviation allowed from the ILS glide path and/or localiser.
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## Appendix 1 to OPS 1.465

**Minimum visibilities for VFR operations**

Airspace class		A B C D E (Note 1)	F G	
			Above 900 m (3 000 ft) AMSL or above 300 m (1 000 ft) above terrain, whichever is the higher	At and below 900 m (3 000 ft) AMSL or 300 m (1 000 ft) above terrain, whichever is the higher
Distance from cloud		1 500 m horizontally 300 m (1 000 ft) vertically	Clear of cloud and in sight of the surface	
Flight visibility		8 km at and above 3 050 m (10 000 ft) AMSL (Note 2) 5 km below 3 050 m (10 000 ft) AMSL	5 km (Note 3)	

Note 1: VMC minima for Class A airspace are included for guidance but do not imply acceptance of VFR Flights in Class A airspace

Note 2: When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000 ft.

Note 3: Cat A and B aeroplanes may be operated in flight visibilities down to 3 000 m, provided the appropriate ATS authority permits use of a flight visibility less than 5 km, and the circumstances are such, that the probability of encounters with other traffic is low, and the IAS is 140 kt or less.

## SUBPART F

## PERFORMANCE GENERAL

## OPS 1.470

**Applicability**

- (a) An operator shall ensure that multi-engine aeroplanes powered by turbo propeller engines with a maximum approved passenger seating configuration of more than 9 or a maximum take-off mass exceeding 5 700 kg, and all multi-engine turbojet powered aeroplanes are operated in accordance with Subpart G (Performance Class A).
- (b) An operator shall ensure that propeller driven aeroplanes with a maximum approved passenger seating configuration of nine or less, and a maximum take-off mass of 5 700 kg or less are operated in accordance with Subpart H (Performance Class B).
- (c) An operator shall ensure that aeroplanes powered by reciprocating engines with a maximum approved passenger seating configuration of more than nine or a maximum take-off mass exceeding 5 700 kg are operated in accordance with Subpart I (Performance Class C).
- (d) Where full compliance with the requirements of the appropriate Subpart cannot be shown due to specific design characteristics (e.g. supersonic aeroplanes or seaplanes), the operator shall apply approved performance standards that ensure a level of safety equivalent to that of the appropriate Subpart.

## OPS 1.475

**General**

- (a) An operator shall ensure that the mass of the aeroplane:
  - 1. at the start of the take-off; or, in the event of in-flight re-planning;
  - 2. at the point from which the revised operational flight plan applies, is not greater than the mass at which the requirements of the appropriate Subpart can be complied with for the flight to be undertaken, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is provided for in the particular requirement.
- (b) An operator shall ensure that the approved performance Data contained in the Aeroplane Flight Manual is used to determine compliance with the requirements of the appropriate Subpart, supplemented as necessary with other data acceptable to the Authority as prescribed in the relevant Subpart. When applying the factors prescribed in the appropriate Subpart, account may be taken of any operational factors already incorporated in the Aeroplane Flight Manual performance data to avoid double application of factors.
- (c) When showing compliance with the requirements of the appropriate Subpart, due account shall be taken of aeroplane configuration, environmental conditions and the operation of systems which have an adverse effect on performance.
- (d) For performance purposes, a damp runway, other than a grass runway, may be considered to be dry.
- (e) An operator shall take account of charting accuracy when assessing compliance with the take-off requirements of the applicable subpart.

## OPS 1.480

**Terminology**

- (a) The following terms used in Subparts F, G, H, I and J, have the following meaning:
  - 1. "Accelerate-stop distance available (ASDA)". The length of the take-off run available plus the length of stop way, if such stop way is declared available by the appropriate Authority and is capable of bearing the mass of the aeroplane under the prevailing operating conditions;

2. "Contaminated runway". A runway is considered to be contaminated when more than 25 % of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by the following:
    - (i) surface water more than 3 mm (0,125 in) deep, or by slush, or loose snow, equivalent to more than 3 mm (0,125 in) of water;
    - (ii) snow which has been compressed into a solid mass which resists further compression and will hold together or break into lumps if picked up (compacted snow); or
    - (iii) ice, including wet ice.
  3. "Damp runway". A runway is considered damp when the surface is not dry, but when the moisture on it does not give it a shiny appearance.
  4. "Dry runway". A dry runway is one which is neither wet nor contaminated, and includes those paved runways which have been specially prepared with grooves or porous pavement and maintained to retain "effectively dry" braking action even when moisture is present.
  5. "Landing distance available (LDA)". The length of the runway which is declared available by the appropriate Authority and suitable for the ground run of an aeroplane landing.
  6. "Maximum approved passenger seating configuration". The maximum passenger seating capacity of an individual aeroplane, excluding pilot seats or flight deck seats and cabin crew seats as applicable, used by the operator, approved by the Authority and specified in the Operations Manual.
  7. "Take-off distance available (TODA)". The length of the take-off run available plus the length of the clearway available.
  8. "Take-off mass". The take-off mass of the aeroplane shall be taken to be its mass, including everything and everyone carried at the commencement of the take-off run.
  9. "Take-off run available (TORA)". The length of runway which is declared available by the appropriate Authority and suitable for the ground run of an aeroplane taking off.
  10. "Wet runway". A runway is considered wet when the runway surface is covered with water, or equivalent, less than specified in subparagraph (a)2. above or when there is sufficient moisture on the runway surface to cause it to appear reflective, but without significant areas of standing water.
- (b) The terms "accelerate-stop distance", "take-off distance", "take-off run", "net take-off flight path", "one engine inoperative en-route net flight path" and "two engines inoperative en-route net flight path" as relating to the aeroplane have their meanings defined in the airworthiness requirements under which the aeroplane was certificated, or as specified by the Authority if it finds that definition inadequate for showing compliance with the performance operating limitations.
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## SUBPART G

## PERFORMANCE CLASS A

## OPS 1.485

**General**

- (a) An operator shall ensure that, for determining compliance with the requirements of this Subpart, the approved performance data in the Aeroplane Flight Manual is supplemented as necessary with other data acceptable to the Authority if the approved performance data in the Aeroplane Flight Manual is insufficient in respect of items such as:
1. accounting for reasonably expected adverse operating conditions such as take-off and landing on contaminated runways; and
  2. consideration of engine failure in all flight phases.
- (b) An operator shall ensure that, for the wet and contaminated runway case, performance data determined in accordance with applicable requirements on certification of large aeroplanes or equivalent acceptable to the Authority is used.

## OPS 1.490

**Take-off**

- (a) An operator shall ensure that the take-off mass does not exceed the maximum take-off mass specified in the Aeroplane Flight Manual for the pressure altitude and the ambient temperature at the aerodrome at which the take-off is to be made.
- (b) An operator must meet the following requirements when determining the maximum permitted take-off mass:
1. the accelerate-stop distance must not exceed the accelerate-stop distance available;
  2. the take-off distance must not exceed the take-off distance available, with a clearway distance not exceeding half of the take-off run available;
  3. the take-off run must not exceed the take-off run available;
  4. compliance with this paragraph must be shown using a single value of V1 for the rejected and continued take-off; and
  5. on a wet or contaminated runway, the take-off mass must not exceed that permitted for a take-off on a dry runway under the same conditions.
- (c) When showing compliance with subparagraph (b) above, an operator must take account of the following:
1. the pressure altitude at the aerodrome;
  2. the ambient temperature at the aerodrome;
  3. the runway surface condition and the type of runway surface;
  4. the runway slope in the direction of take-off;
  5. not more than 50 % of the reported head-wind component or not less than 150 % of the reported tailwind component; and
  6. the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

## OPS 1.495

**Take-off obstacle clearance**

- (a) An operator shall ensure that the net take-off flight path clears all obstacles by a vertical distance of at least 35 ft or by a horizontal distance of at least 90 m plus  $0,125 \times D$ , where D is the horizontal distance the aeroplane has travelled from the end of the take-off distance available or the end of the take-off distance if a turn is scheduled before the end of the take-off distance available. For aeroplanes with a wingspan of less than 60 m a horizontal obstacle clearance of half the aeroplane wingspan plus 60 m, plus  $0,125 \times D$  may be used.
- (b) When showing compliance with subparagraph (a) above, an operator must take account of the following:
1. the mass of the aeroplane at the commencement of the take-off run;
  2. the pressure altitude at the aerodrome;
  3. the ambient temperature at the aerodrome; and
  4. not more than 50 % of the reported head-wind component or not less than 150 % of the reported tailwind component.
- (c) When showing compliance with subparagraph (a) above:
1. track changes shall not be allowed up to the point at which the net take-off flight path has achieved a height equal to one half the wingspan but not less than 50 ft above the elevation of the end of the take-off run available. Thereafter, up to a height of 400 ft it is assumed that the aeroplane is banked by no more than 15°. Above 400 ft height bank angles greater than 15°, but not more than 25° may be scheduled;
  2. any part of the net take-off flight path in which the aeroplane is banked by more than 15° must clear all obstacles within the horizontal distances specified in subparagraphs (a), (d) and (e) of this paragraph by a vertical distance of at least 50 ft; and
  3. an operator must use special procedures, subject to the approval of the Authority, to apply increased bank angles of not more than 20° between 200 ft and 400 ft, or not more than 30° above 400 ft (See Appendix 1 to OPS 1.495 (c)3).
  4. Adequate allowance must be made for the effect of bank angle on operating speeds and flight path including the distance increments resulting from increased operating speeds.
- (d) When showing compliance with subparagraph (a) above for those cases where the intended flight path does not require track changes of more than 15°, an operator need not consider those obstacles which have a lateral distance greater than:
1. 300 m, if the pilot is able to maintain the required navigational accuracy through the obstacle accountability area; or
  2. 600 m, for flights under all other conditions.
- (e) When showing compliance with subparagraph (a) above for those cases where the intended flight path does require track changes of more than 15°, an operator need not consider those obstacles which have a lateral distance greater than:
1. 600 m, if the pilot is able to maintain the required navigational accuracy through the obstacle accountability area; or
  2. 900 m for flights under all other conditions.
- (f) An operator shall establish contingency procedures to satisfy the requirements of OPS 1.495 and to provide a safe route, avoiding obstacles, to enable the aeroplane to either comply with the en-route requirements of OPS 1.500, or land at either the aerodrome of departure or at a take-off alternate aerodrome.

## OPS 1.500

**En-route — One engine inoperative**

- (a) An operator shall ensure that the one engine inoperative en-route net flight path data shown in the Aeroplane Flight Manual, appropriate to the meteorological conditions expected for the flight, complies with either subparagraph (b) or (c) at all points along the route. The net flight path must have a positive gradient at 1 500 ft above the aerodrome where the landing is assumed to be made after engine failure. In meteorological conditions requiring the operation of ice protection systems, the effect of their use on the net flight path must be taken into account.

- (b) The gradient of the net flight path must be positive at at least 1 000 ft above all terrain and obstructions along the route within 9,3 km (5 nm) on either side of the intended track.
- (c) The net flight path must permit the aeroplane to continue flight from the cruising altitude to an aerodrome where a landing can be made in accordance with OPS 1.515 or 1.520 as appropriate, the net flight path clearing vertically, by at least 2 000 ft, all terrain and obstructions along the route within 9,3 km (5 nm) on either side of the intended track in accordance with subparagraphs 1 to 4 below:
  - 1. the engine is assumed to fail at the most critical point along the route;
  - 2. account is taken of the effects of winds on the flight path;
  - 3. fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with the required fuel reserves, if a safe procedure is used; and
  - 4. the aerodrome where the aeroplane is assumed to land after engine failure must meet the following criteria:
    - (i) the performance requirements at the expected landing mass are met; and
    - (ii) weather reports or forecasts, or any combination thereof, and field condition reports indicate that a safe landing can be accomplished at the estimated time of landing.
- (d) When showing compliance with OPS 1.500, an operator must increase the width margins of subparagraphs (b) and (c) above to 18,5 km (10 nm) if the navigational accuracy does not meet the 95 % containment level.

#### OPS 1.505

##### **En-route — Aeroplanes with three or more engines, two engines inoperative**

- (a) An operator shall ensure that at no point along the intended track will an aeroplane having three or more engines be more than 90 minutes, at the all-engines long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met unless it complies with subparagraphs (b) to (f) below.
- (b) The two engines inoperative en-route net flight path data must permit the aeroplane to continue the flight, in the expected meteorological conditions, from the point where two engines are assumed to fail simultaneously, to an aerodrome at which it is possible to land and come to a complete stop when using the prescribed procedure for a landing with two engines inoperative. The net flight path must clear vertically, by at least 2 000 ft all terrain and obstructions along the route within 9,3 km (5 nm) on either side of the intended track. At altitudes and in meteorological conditions requiring ice protection systems to be operable, the effect of their use on the net flight path data must be taken into account. If the navigational accuracy does not meet the 95 % containment level, an operator must increase the width margin given above to 18,5 km (10 nm).
- (c) The two engines are assumed to fail at the most critical point of that portion of the route where the aeroplane is more than 90 minutes, at the all engines long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met.
- (d) The net flight path must have a positive gradient at 1 500 ft above the aerodrome where the landing is assumed to be made after the failure of two engines.
- (e) Fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with the required fuel reserves, if a safe procedure is used.
- (f) The expected mass of the aeroplane at the point where the two engines are assumed to fail must not be less than that which would include sufficient fuel to proceed to an aerodrome where the landing is assumed to be made, and to arrive there at least 1 500 ft directly over the landing area and thereafter to fly level for 15 minutes.

## OPS 1.510

**Landing — Destination and alternate aerodromes**

- (a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475(a) does not exceed the maximum landing mass specified for the altitude and the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome.
- (b) For instrument approaches with a missed approach gradient greater than 2,5 % an operator shall verify that the expected landing mass of the aeroplane allows a missed approach with a climb gradient equal to or greater than the applicable missed approach gradient in the one-engine inoperative missed approach configuration and speed (see applicable requirements on certification of large aeroplanes). The use of an alternative method must be approved by the Authority.
- (c) For instrument approaches with decision heights below 200 ft, an operator must verify that the expected landing mass of the aeroplane allows a missed approach gradient of climb, with the critical engine failed and with the speed and configuration used for go-around of at least 2,5 %, or the published gradient, whichever is the greater (see CS AWO 243). The use of an alternative method must be approved by the Authority.

## OPS 1.515

**Landing — Dry runways**

- (a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475(a) for the estimated time of landing at the destination aerodrome and at any alternate aerodrome allows a full stop landing from 50 ft above the threshold:
  - 1. For turbo-jet powered aeroplanes, within 60 % of the landing distance available; or
  - 2. For turbo-propeller powered aeroplanes, within 70 % of the landing distance available;
  - 3. For steep approach procedures the Authority may approve the use of landing distance data factored in accordance with subparagraphs (a)1 and (a)2 above as appropriate, based on a screen height of less than 50 ft, but not less than 35 ft. (See Appendix 1 to OPS 1.515(a)3);
  - 4. When showing compliance with subparagraphs (a)1 and (a)2 above, the Authority may exceptionally approve, when satisfied that there is a need (see Appendix 1), the use of short landing operations in accordance with Appendices 1 and 2 together with any other supplementary conditions that the Authority considers necessary in order to ensure an acceptable level of safety in the particular case.
- (b) When showing compliance with subparagraph (a) above, an operator must take account of the following:
  - 1. the altitude at the aerodrome;
  - 2. not more than 50 % of the head-wind component or not less than 150 % of the tailwind component; and
  - 3. the runway slope in the direction of landing if greater than +/-2 %.
- (c) When showing compliance with subparagraph (a) above, it must be assumed that:
  - 1. the aeroplane will land on the most favourable runway, in still air; and
  - 2. the aeroplane will land on the runway most likely to be assigned considering the probable wind speed and direction and the ground handling characteristics of the aeroplane, and considering other conditions such as landing aids and terrain.
- (d) If an operator is unable to comply with subparagraph (c)1 above for a destination aerodrome having a single runway where a landing depends upon a specified wind component, an aeroplane may be despatched if 2 alternate aerodromes are designated which permit full compliance with subparagraphs (a), (b) and (c). Before commencing an approach to land at the destination aerodrome the commander must satisfy himself/herself that a landing can be made in full compliance with OPS 1.510 and subparagraphs (a) and (b) above.



- (e) If an operator is unable to comply with subparagraph (c)2 above for the destination aerodrome, the aeroplane may be despatched if an alternate aerodrome is designated which permits full compliance with subparagraphs (a), (b) and (c).

OPS 1.520

**Landing — Wet and contaminated runways**

- (a) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be wet, the landing distance available is at least 115 % of the required landing distance, determined in accordance with OPS 1.515.
  - (b) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be contaminated, the landing distance available must be at least the landing distance determined in accordance with subparagraph (a) above, or at least 115 % of the landing distance determined in accordance with approved contaminated landing distance data or equivalent, accepted by the Authority, whichever is greater.
  - (c) A landing distance on a wet runway shorter than that required by subparagraph (a) above, but not less than that required by OPS 1.515 (a), may be used if the Aeroplane Flight Manual includes specific additional information about landing distances on wet runways.
  - (d) A landing distance on a specially prepared contaminated runway shorter than that required by subparagraph (b) above, but not less than that required by OPS 1.515 (a), may be used if the Aeroplane Flight Manual includes specific additional information about landing distances on contaminated runways.
  - (e) When showing compliance with subparagraphs (b), (c) and (d) above, the criteria of OPS 1.515 shall be applied accordingly except that OPS 1.515 (a)1 and 2 shall not be applied to subparagraph (b) above.
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*Appendix 1 to OPS 1.495 (c)3.*

**Approval of increased bank angles**

- (a) For the use of the increased bank angles requiring special approval, the following criteria shall be met:
1. the Aeroplane Flight Manual must contain approved data for the required increase of operating speed and data to allow the construction of the flight path considering the increased bank angles and speeds;
  2. visual guidance must be available for navigation accuracy;
  3. weather minima and wind limitations must be specified for each runway and approved by the Authority;
  4. training in accordance with OPS 1.975.
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*Appendix 1 to OPS 1.515 (a)3.***Steep approach procedures**

- (a) The Authority may approve the application of steep approach procedures using glide slope angles of 4,5° or more and with screen heights of less than 50 ft but not less than 35 ft, provided that the following criteria are met:
1. the Aeroplane Flight Manual must state the maximum approved glide slope angle, any other limitations, normal, abnormal or emergency procedures for the steep approach as well as amendments to the field length data when using steep approach criteria;
  2. a suitable glide path reference system comprising at least a visual glide path indicating system must be available at each aerodrome at which steep approach procedures are to be conducted; and
  3. weather minima must be specified and approved for each runway to be used with a steep approach. Consideration must be given to the following:
    - (i) the obstacle situation;
    - (ii) the type of glide path reference and runway guidance such as visual aids, MLS, 3D-NAV, ILS, LLZ, VOR, NDB;
    - (iii) the minimum visual reference to be required at DH and MDA;
    - (iv) available airborne equipment;
    - (v) pilot qualification and special aerodrome familiarisation;
    - (vi) Aeroplane Flight Manual limitations and procedures; and
    - (vii) missed approach criteria.
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*Appendix 1 to OPS 1.515 (a)4.***Short landing operations**

- (a) For the purpose of OPS 1.515 (a)4., the distance used for the calculation of the permitted landing mass may consist of the usable length of the declared safe area plus the declared landing distance available. The Authority may approve such operations in accordance with the following criteria:
1. Demonstration of the need for short landing operations. There must be a clear public interest and operational necessity for the operation, either due to the remoteness of the airport or to physical limitations relating to extending the runway.
  2. Aeroplane and operational criteria.
    - (i) Short landing operations will only be approved for aeroplanes where the vertical distance between the path of the pilot's eye and the path of the lowest part of the wheels, with the aeroplane established on the normal glide path, does not exceed 3 m.
    - (ii) When establishing aerodrome operating minima the visibility/RVR must not be less than 1,5 km. In addition, wind limitations must be specified in the Operations Manual.
    - (iii) Minimum pilot experience, training requirements and special aerodrome familiarisation must be specified for such operations in the Operations Manual.
  3. It is assumed that the crossing height over the beginning of the usable length of the declared safe area is 50 ft.
  4. Additional criteria. The Authority may impose such additional conditions as are deemed necessary for a safe operation taking into account the aeroplane type characteristics, orographic characteristics in the approach area, available approach aids and missed approach/baulked landing considerations. Such additional conditions may be, for instance, the requirement for VASI/PAPI -type visual slope indicator system.
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*Appendix 2 to OPS 1.515 (a)4.***Airfield criteria for short landing operations**

- (a) The use of the safe area must be approved by the airport authority.
  - (b) The usable length of the declared safe area under the provisions of 1.515(a)4, and this Appendix, must not exceed 90 m.
  - (c) The width of the declared safe area shall not be less than twice the runway width or twice the wing span, whichever is the greater, centred on the extended runway centre line.
  - (d) The declared safe area must be clear of obstructions or depressions which would endanger an aeroplane undershooting the runway and no mobile object shall be permitted on the declared safe area while the runway is being used for short landing operations.
  - (e) The slope of the declared safe area must not exceed 5 % upward nor 2 % downward in the direction of landing.
  - (f) For the purpose of this operation, the bearing strength requirement of OPS 1.480(a)5 need not apply to the declared safe area.
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## SUBPART H

## PERFORMANCE CLASS B

## OPS 1.525

**General**

- (a) An operator shall not operate a single-engine aeroplane:
1. at night; or
  2. in instrument meteorological conditions except under special visual flight rules.

*Note:* Limitations on the operation of single-engine aeroplanes are covered by OPS 1.240(a)6.

- (b) An operator shall treat two-engine aeroplanes which do not meet the climb requirements of Appendix 1 to OPS 1.525(b) as single-engine aeroplanes.

## OPS 1.530

**Take-off**

- (a) An operator shall ensure that the take-off mass does not exceed the maximum take-off mass specified in the Aeroplane Flight Manual for the pressure altitude and the ambient temperature at the aerodrome at which the take-off is to be made.
- (b) An operator shall ensure that the unfactored take-off distance, as specified in the Aeroplane Flight Manual does not exceed:
1. when multiplied by a factor of 1,25, the take-off run available; or
  2. when stop way and/or clearway is available, the following:
    - (i) the take-off run available;
    - (ii) when multiplied by a factor of 1,15, the take-off distance available; and
    - (iii) when multiplied by a factor of 1,3, the accelerate-stop distance available.
- (c) When showing compliance with subparagraph (b) above, an operator shall take account of the following:
1. the mass of the aeroplane at the commencement of the take-off run;
  2. the pressure altitude at the aerodrome;
  3. the ambient temperature at the aerodrome;
  4. the runway surface condition and the type of runway surface;
  5. the runway slope in the direction of take-off; and
  6. Not more than 50 % of the reported head-wind component or not less than 150 % of the reported tail-wind component.

## OPS 1.535

**Take-off obstacle clearance — Multi-engined aeroplanes**

- (a) An operator shall ensure that the take-off flight path of aeroplanes with two or more engines, determined in accordance with this subparagraph, clears all obstacles by a vertical margin of at least 50 ft, or by a horizontal distance of at least 90 m plus  $0,125 \times D$ , where D is the horizontal distance travelled by the aeroplane from the end of the take-off distance available or the end of the take-off distance if a turn is scheduled before the end of the take-off distance available except as provided in subparagraphs (b) and (c) below. For aeroplanes with a wingspan of less than 60 m a horizontal obstacle clearance of half the aeroplane wingspan plus 60 m, plus  $0,125 \times D$  may be used. When showing compliance with this subparagraph it must be assumed that:
1. the take-off flight path begins at a height of 50 ft above the surface at the end of the take-off distance required by OPS 1.530 (b) and ends at a height of 1 500 ft above the surface;
  2. the aeroplane is not banked before the aeroplane has reached a height of 50 ft above the surface, and that thereafter the angle of bank does not exceed 15°;
  3. failure of the critical engine occurs at the point on the all engine take-off flight path where visual reference for the purpose of avoiding obstacles is expected to be lost;
  4. the gradient of the take-off flight path from 50 ft to the assumed engine failure height is equal to the average all-engine gradient during climb and transition to the en-route configuration, multiplied by a factor of 0,77; and
  5. the gradient of the take-off flight path from the height reached in accordance with subparagraph 4 above to the end of the take-off flight path is equal to the one engine inoperative en-route climb gradient shown in the Aeroplane Flight Manual.
- (b) When showing compliance with subparagraph (a) above for those cases where the intended flight path does not require track changes of more than 15°, an operator need not consider those obstacles which have a lateral distance greater than:
1. 300 m, if the flight is conducted under conditions allowing visual course guidance navigation, or if navigational aids are available enabling the pilot to maintain the intended flight path with the same accuracy (see Appendix 1 to OPS 1.535 (b)1. and (c)1.); or
  2. 600 m, for flights under all other conditions.
- (c) When showing compliance with subparagraph (a) above for those cases where the intended flight path requires track changes of more than 15°, an operator need not consider those obstacles which have a lateral distance greater than:
1. 600 m for flights under conditions allowing visual course guidance navigation (see Appendix 1 to OPS 1.535 (b)1 and (c)1);
  2. 900 m for flights under all other conditions.
- (d) When showing compliance with subparagraphs (a), (b) and (c) above, an operator must take account of the following:
1. the mass of the aeroplane at the commencement of the take-off run;
  2. the pressure altitude at the aerodrome;
  3. the ambient temperature at the aerodrome; and
  4. not more than 50 % of the reported head-wind component or not less than 150 % of the reported tail-wind component.

## OPS 1.540

**En-Route — Multi-engined aeroplanes**

- (a) An operator shall ensure that the aeroplane, in the meteorological conditions expected for the flight, and in the event of the failure of one engine, with the remaining engines operating within the maximum continuous power conditions specified, is capable of continuing flight at or above the relevant minimum altitudes for safe flight stated in the Operations Manual to a point 1 000 ft above an aerodrome at which the performance requirements can be met.

- (b) When showing compliance with subparagraph (a) above:
1. the aeroplane must not be assumed to be flying at an altitude exceeding that at which the rate of climb equals 300 ft per minute with all engines operating within the maximum continuous power conditions specified; and
  2. the assumed en-route gradient with one engine inoperative shall be the gross gradient of descent or climb, as appropriate, respectively increased by a gradient of 0,5 %, or decreased by a gradient of 0,5 %.

OPS 1.542

**En-route — Single-engine aeroplanes**

- (a) An operator shall ensure that the aeroplane, in the meteorological conditions expected for the flight, and in the event of engine failure, is capable of reaching a place at which a safe forced landing can be made. For landplanes, a place on land is required, unless otherwise approved by the Authority.
- (b) When showing compliance with subparagraph (a) above:
1. the aeroplane must not be assumed to be flying, with the engine operating within the maximum continuous power conditions specified, at an altitude exceeding that at which the rate of climb equals 300 ft per minute; and
  2. the assumed en-route gradient shall be the gross gradient of descent increased by a gradient of 0,5 %.

OPS 1.545

**Landing — Destination and alternate aerodromes**

An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475 (a) does not exceed the maximum landing mass specified for the altitude and the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome.

OPS 1.550

**Landing — Dry runway**

- (a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475 (a) for the estimated time of landing allows a full stop landing from 50 ft above the threshold within 70 % of the landing distance available at the destination aerodrome and at any alternate aerodrome.
1. The Authority may approve the use of landing distance data factored in accordance with this paragraph based on a screen height of less than 50 ft, but not less than 35 ft (see Appendix 1 to OPS 1.550 (a)).
  2. The Authority may approve short landing operations, in accordance with the criteria in Appendix 2 to OPS 1.550 (a).
- (b) When showing compliance with subparagraph (a) above, an operator shall take account of the following:
1. the altitude at the aerodrome;
  2. not more than 50 % of the head-wind component or not less than 150 % of the tail-wind component.
  3. the runway surface condition and the type of runway surface; and
  4. the runway slope in the direction of landing;
- (c) For despatching an aeroplane in accordance with subparagraph (a) above, it must be assumed that:
1. the aeroplane will land on the most favourable runway, in still air; and
  2. the aeroplane will land on the runway most likely to be assigned considering the probable wind speed and direction and the ground handling characteristics of the aeroplane, and considering other conditions such as landing aids and terrain.



- (d) If an operator is unable to comply with subparagraph (c)2 above for the destination aerodrome, the aeroplane may be despatched if an alternate aerodrome is designated which permits full compliance with subparagraphs (a), (b) and (c) above.

*OPS 1.555*

**Landing — Wet and contaminated runways**

- (a) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be wet, the landing distance available is equal to or exceeds the required landing distance, determined in accordance with OPS 1.550, multiplied by a factor of 1,15.
  - (b) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be contaminated, the landing distance, determined by using data acceptable to the Authority for these conditions, does not exceed the landing distance available.
  - (c) A landing distance on a wet runway shorter than that required by subparagraph (a) above, but not less than that required by OPS 1.550 (a), may be used if the Aeroplane Flight Manual includes specific additional information about landing distances on wet runways.
-

*Appendix 1 to OPS 1.525 (b)***General — Take-off and landing climb****(a) Take-off climb****1. All engines operating**

- (i) The steady gradient of climb after take-off must be at least 4 % with:
  - (A) take-off power on each engine;
  - (B) the landing gear extended except that if the landing gear can be retracted in not more than 7 seconds, it may be assumed to be retracted;
  - (C) the wing flaps in the take-off position(s); and
  - (D) a climb speed not less than the greater of 1,1 VMC and 1,2 VS1.

**2. One engine inoperative**

- (i) The steady gradient of climb at an altitude of 400 ft above the take-off surface must be measurably positive with:
  - (A) the critical engine inoperative and its propeller in the minimum drag position;
  - (B) the remaining engine at take-off power;
  - (C) the landing gear retracted;
  - (D) the wing flaps in the take-off position(s); and
  - (E) a climb speed equal to that achieved at 50 ft.
- (ii) The steady gradient of climb must be not less than 0,75 % at an altitude of 1 500 ft above the take-off surface with:
  - (A) the critical engine inoperative and its propeller in the minimum drag position;
  - (B) the remaining engine at not more than maximum continuous power;
  - (C) the landing gear retracted;
  - (D) the wing flaps retracted; and
  - (E) a climb speed not less than 1,2 VS1.

**(b) Landing climb****1. All engines operating**

- (i) The steady gradient of climb must be at least 2,5 % with:
  - (A) not more than the power or thrust that is available eight seconds after initiation of movement of the power controls from the minimum flight idle position;
  - (B) the landing gear extended;
  - (C) the wing flaps in the landing position; and
  - (D) a climb speed equal to VREF.

2. One engine inoperative

- (i) The steady gradient of climb must be not less than 0,75 % at an altitude of 1 500 ft above the landing surface with:
    - (A) the critical engine inoperative and its propeller in the minimum drag position;
    - (B) the remaining engine at not more than maximum continuous power;
    - (C) the landing gear retracted;
    - (D) the wing flaps retracted; and
    - (E) a climb speed not less than 1,2 VS1.
-

*Appendix 1 to OPS 1.535 (b)1. and (c)1.*

**Take-off flight path — Visual course guidance navigation**

In order to allow visual course guidance navigation, an operator must ensure that the weather conditions prevailing at the time of operation, including ceiling and visibility, are such that the obstacle and/or ground reference points can be seen and identified. The Operations Manual must specify, for the aerodrome(s) concerned, the minimum weather conditions which enable the flight crew to continuously determine and maintain the correct flight path with respect to ground reference points, so as to provide a safe clearance with respect to obstructions and terrain as follows:

- (a) the procedure must be well defined with respect to ground reference points so that the track to be flown can be analysed for obstacle clearance requirements;
  - (b) the procedure must be within the capabilities of the aeroplane with respect to forward speed, bank angle and wind effects;
  - (c) a written and/or pictorial description of the procedure must be provided for crew use; and
  - (d) the limiting environmental conditions must be specified (e.g. wind, cloud, visibility, day/night, ambient lighting, obstruction lighting).
-

*Appendix 1 to OPS 1.550 (a)***Steep approach procedures**

- (a) The Authority may approve the application of steep approach procedures using glide slope angles of 4,5° or more, and with screen heights of less than 50 ft but not less than 35 ft, provided that the following criteria are met:
1. the Aeroplane Flight Manual must state the maximum approved glide slope angle, any other limitations, normal, abnormal or emergency procedures for the steep approach as well as amendments to the field length data when using steep approach criteria;
  2. a suitable glide path reference system, comprising at least a visual glide path indicating system, must be available at each aerodrome at which steep approach procedures are to be conducted; and
  3. weather minima must be specified and approved for each runway to be used with a steep approach. Consideration must be given to the following:
    - (i) the obstacle situation;
    - (ii) the type of glide path reference and runway guidance such as visual aids, MLS, 3D-NAV, ILS, LLZ, VOR, NDB;
    - (iii) the minimum visual reference to be required at DH and MDA;
    - (iv) available airborne equipment;
    - (v) pilot qualification and special aerodrome familiarisation;
    - (vi) Aeroplane Flight Manual limitations and procedures; and
    - (vii) missed approach criteria.
-

*Appendix 2 to OPS 1.550 (a)***Short landing operations**

- (a) For the purpose of OPS 1.550 (a)2., the distance used for the calculation of the permitted landing mass may consist of the usable length of the declared safe area plus the declared landing distance available. The Authority may approve such operations in accordance with the following criteria:
1. the use of the declared safe area must be approved by the aerodrome Authority;
  2. the declared safe area must be clear of obstructions or depressions which would endanger an aeroplane under-shooting the runway, and no mobile object shall be permitted on the declared safe area while the runway is being used for short landing operations;
  3. the slope of the declared safe area must not exceed 5 % upward slope nor 2 % downward slope in the direction of landing;
  4. the usable length of the declared safe area under the provisions of this Appendix shall not exceed 90 metres;
  5. the width of the declared safe area shall not be less than twice the runway width, centred on the extended runway centreline;
  6. it is assumed that the crossing height over the beginning of the usable length of the declared safe area shall not be less than 50 ft;
  7. for the purpose of this operation, the bearing strength requirement of OPS 1.480 (a)5. need not apply to the declared safe area;
  8. weather minima must be specified and approved for each runway to be used and shall not be less than the greater of VFR or non precision approach minima;
  9. pilot requirements must be specified (OPS 1.975 (a) refers);
  10. the Authority may impose such additional conditions as are necessary for safe operation taking into account the aeroplane type characteristics, approach aids and missed approach/baulked landing considerations.
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## SUBPART I

## PERFORMANCE CLASS C

## OPS 1.560

**General**

An operator shall ensure that, for determining compliance with the requirements of this Subpart, the approved performance data in the Aeroplane Flight Manual is supplemented, as necessary, with other data acceptable to the Authority if the approved performance data in the Aeroplane Flight Manual is insufficient.

## OPS 1.565

**Take-off**

- (a) An operator shall ensure that the take-off mass does not exceed the maximum take-off mass specified in the Aeroplane Flight Manual for the pressure altitude and the ambient temperature at the aerodrome at which the take-off is to be made.
- (b) An operator shall ensure that, for aeroplanes which have take-off field length data contained in their Aeroplane Flight Manuals that do not include engine failure accountability, the distance from the start of the take-off roll required by the aeroplane to reach a height of 50 ft above the surface with all engines operating within the maximum take-off power conditions specified, when multiplied by a factor of either:

1. 1,33 for aeroplanes having two engines; or
2. 1,25 for aeroplanes having three engines; or
3. 1,18 for aeroplanes having four engines,

does not exceed the take-off run available at the aerodrome at which the take-off is to be made.

- (c) An operator shall ensure that, for aeroplanes which have take-off field length data contained in their Aeroplane Flight Manuals which accounts for engine failure, the following requirements are met in accordance with the specifications in the Aeroplane Flight Manual:
1. the accelerate-stop distance must not exceed the accelerate-stop distance available;
  2. the take-off distance must not exceed the take-off distance available, with a clearway distance not exceeding half of the take-off run available;
  3. the take-off run must not exceed the take-off run available;
  4. compliance with this paragraph must be shown using a single value of V1 for the rejected and continued take-off; and
  5. on a wet or contaminated runway the take-off mass must not exceed that permitted for a take-off on a dry runway under the same conditions.
- (d) When showing compliance with subparagraphs (b) and (c) above, an operator must take account of the following:
1. the pressure altitude at the aerodrome;
  2. the ambient temperature at the aerodrome;
  3. the runway surface condition and the type of runway surface;
  4. the runway slope in the direction of take-off;
  5. not more than 50 % of the reported head-wind component or not less than 150 % of the reported tail-wind component; and
  6. the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

## OPS 1.570

**Take-off obstacle clearance**

- (a) An operator shall ensure that the take-off flight path with one engine inoperative clears all obstacles by a vertical distance of at least 50 ft plus  $0,01 \times D$ , or by a horizontal distance of at least 90 m plus  $0,125 \times D$ , where D is the horizontal distance the aeroplane has travelled from the end of the take-off distance available. For aeroplanes with a wingspan of less than 60 m a horizontal obstacle clearance of half the aeroplane wingspan plus 60 m, plus  $0,125 \times D$  may be used.
- (b) The take-off flight path must begin at a height of 50 ft above the surface at the end of the take-off distance required by OPS 1.565 (b) or (c) as applicable, and end at a height of 1 500 ft above the surface.
- (c) When showing compliance with subparagraph (a), an operator must take account of the following:
1. the mass of the aeroplane at the commencement of the take-off run;
  2. the pressure altitude at the aerodrome;
  3. the ambient temperature at the aerodrome; and
  4. not more than 50 % of the reported head-wind component or not less than 150 % of the reported tail-wind component.
- (d) When showing compliance with subparagraph (a) above, track changes shall not be allowed up to that point of the take-off flight path where a height of 50 ft above the surface has been achieved. Thereafter, up to a height of 400 ft it is assumed that the aeroplane is banked by no more than  $15^\circ$ . Above 400 ft height bank angles greater than  $15^\circ$ , but not more than  $25^\circ$  may be scheduled. Adequate allowance must be made for the effect of bank angle on operating speeds and flight path including the distance increments resulting from increased operating speeds.
- (e) When showing compliance with subparagraph (a) above for those cases which do not require track changes of more than  $15^\circ$ , an operator need not consider those obstacles which have a lateral distance greater than:
1. 300 m, if the pilot is able to maintain the required navigational accuracy through the obstacle accountability area; or
  2. 600 m, for flights under all other conditions.
- (f) When showing compliance with subparagraph (a) above for those cases which do require track changes of more than  $15^\circ$ , an operator need not consider those obstacles which have a lateral distance greater than:
1. 600 m, if the pilot is able to maintain the required navigational accuracy through the obstacle accountability area; or
  2. 900 m for flights under all other conditions.
- (g) An operator shall establish contingency procedures to satisfy the requirements of OPS 1.570 and to provide a safe route, avoiding obstacles, to enable the aeroplane to either comply with the en-route requirements of OPS 1.580, or land at either the aerodrome of departure or at a take-off alternate aerodrome.

## OPS 1.575

**En-route — All engines operating**

- (a) An operator shall ensure that the aeroplane will, in the meteorological conditions expected for the flight, at any point on its route or on any planned diversion therefrom, be capable of a rate of climb of at least 300 ft per minute with all engines operating within the maximum continuous power conditions specified at:
1. the minimum altitudes for safe flight on each stage of the route to be flown or of any planned diversion therefrom specified in, or calculated from the information contained in, the Operations Manual relating to the aeroplane; and
  2. the minimum altitudes necessary for compliance with the conditions prescribed in OPS 1.580 and 1.585, as appropriate.



## OPS 1.580

**En-route — One engine inoperative**

- (a) An operator shall ensure that the aeroplane will, in the meteorological conditions expected for the flight, in the event of any one engine becoming inoperative at any point on its route or on any planned diversion therefrom and with the other engine or engines operating within the maximum continuous power conditions specified, be capable of continuing the flight from the cruising altitude to an aerodrome where a landing can be made in accordance with OPS 1.595 or OPS 1.600 as appropriate, clearing obstacles within 9,3 km (5 nm) either side of the intended track by a vertical interval of at least:
1. 1 000 ft when the rate of climb is zero or greater; or
  2. 2 000 ft when the rate of climb is less than zero.
- (b) The flight path shall have a positive slope at an altitude of 450 m (1 500 ft) above the aerodrome where the landing is assumed to be made after the failure of one engine.
- (c) For the purpose of this subparagraph the available rate of climb of the aeroplane shall be taken to be 150 ft per minute less than the gross rate of climb specified.
- (d) When showing compliance with this paragraph, an operator must increase the width margins of subparagraph (a) above to 18,5 km (10 nm) if the navigational accuracy does not meet the 95 % containment level.
- (e) Fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with the required fuel reserves, if a safe procedure is used.

## OPS 1.585

**En-Route — Aeroplanes with three or more engines, two engines inoperative**

- (a) An operator shall ensure that, at no point along the intended track, will an aeroplane having three or more engines be more than 90 minutes at the all-engine long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met unless it complies with subparagraphs (b) to (e) below.
- (b) The two-engines inoperative flight path shown must permit the aeroplane to continue the flight, in the expected meteorological conditions, clearing all obstacles within 9,3 km (5 nm) either side of the intended track by a vertical interval of at least 2 000 ft, to an aerodrome at which the performance requirements applicable at the expected landing mass are met.
- (c) The two engines are assumed to fail at the most critical point of that portion of the route where the aeroplane is more than 90 minutes, at the all engines long range cruising speed at standard temperature in still air, away from an aerodrome at which the performance requirements applicable at the expected landing mass are met.
- (d) The expected mass of the aeroplane at the point where the two engines are assumed to fail must not be less than that which would include sufficient fuel to proceed to an aerodrome where the landing is assumed to be made, and to arrive there at an altitude of at least 450 m (1 500 ft) directly over the landing area and thereafter to fly level for 15 minutes.
- (e) For the purpose of this subparagraph the available rate of climb of the aeroplane shall be taken to be 150 ft per minute less than that specified.
- (f) When showing compliance with this paragraph, an operator must increase the width margins of subparagraph (a) above to 18,5 km (10 nm) if the navigational accuracy does not meet the 95 % containment level.
- (g) Fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with the required fuel reserves, if a safe procedure is used.

## OPS 1.590

**Landing — Destination and alternate aerodromes**

An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475 (a) does not exceed the maximum landing mass specified in the Aeroplane Flight Manual for the altitude and, if accounted for in the Aeroplane Flight Manual, the ambient temperature expected for the estimated time of landing at the destination and alternate aerodrome.

## OPS 1.595

**Landing — Dry runways**

- (a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with OPS 1.475 (a) for the estimated time of landing allows a full stop landing from 50 ft above the threshold within 70 % of the landing distance available at the destination and any alternate aerodrome.
- (b) When showing compliance with subparagraph (a) above, an operator must take account of the following:
  - 1. the altitude at the aerodrome;
  - 2. not more than 50 % of the head-wind component or not less than 150 % of the tail-wind component;
  - 3. the type of runway surface; and
  - 4. the slope of the runway in the direction of landing.
- (c) For despatching an aeroplane in accordance with subparagraph (a) above it must be assumed that:
  - 1. the aeroplane will land on the most favourable runway in still air; and
  - 2. the aeroplane will land on the runway most likely to be assigned considering the probable wind speed and direction and the ground handling characteristics of the aeroplane, and considering other conditions such as landing aids and terrain.
- (d) If an operator is unable to comply with subparagraph (c)2 above for the destination aerodrome, the aeroplane may be despatched if an alternate aerodrome is designated which permits full compliance with subparagraphs (a), (b) and (c).

## OPS 1.600

**Landing — Wet and contaminated runways**

- (a) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be wet, the landing distance available is equal to or exceeds the required landing distance, determined in accordance with OPS 1.595, multiplied by a factor of 1,15.
- (b) An operator shall ensure that when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be contaminated, the landing distance determined by using data acceptable to the Authority for these conditions, does not exceed the landing distance available.

## SUBPART J

## MASS AND BALANCE

## OPS 1.605

**General**

(See Appendix 1 to OPS 1.605)

- (a) An operator shall ensure that during any phase of operation, the loading, mass and centre of gravity of the aeroplane complies with the limitations specified in the approved Aeroplane Flight Manual, or the Operations Manual if more restrictive.
- (b) An operator must establish the mass and the centre of gravity of any aeroplane by actual weighing prior to initial entry into service and thereafter at intervals of four years if individual aeroplane masses are used and nine years if fleet masses are used. The accumulated effects of modifications and repairs on the mass and balance must be accounted for and properly documented. Furthermore, aeroplanes must be reweighed if the effect of modifications on the mass and balance is not accurately known.
- (c) An operator must determine the mass of all operating items and crew members included in the aeroplane dry operating mass by weighing or by using standard masses. The influence of their position on the aeroplane centre of gravity must be determined.
- (d) An operator must establish the mass of the traffic load, including any ballast, by actual weighing or determine the mass of the traffic load in accordance with standard passenger and baggage masses as specified in OPS 1.620.
- (e) An operator must determine the mass of the fuel load by using the actual density or, if not known, the density calculated in accordance with a method specified in the Operations Manual.

## OPS 1.607

**Terminology**

- (a) Dry operating mass. The total mass of the aeroplane ready for a specific type of operation excluding all usable fuel and traffic load. This mass includes items such as:
  - 1. crew and crew baggage;
  - 2. catering and removable passenger service equipment; and
  - 3. potable water and lavatory chemicals.
- (b) Maximum zero fuel mass. The maximum permissible mass of an aeroplane with no usable fuel. The mass of the fuel contained in particular tanks must be included in the zero fuel mass when it is explicitly mentioned in the Aeroplane Flight Manual limitations.
- (c) Maximum structural landing mass. The maximum permissible total aeroplane mass upon landing under normal circumstances.
- (d) Maximum structural take off mass. The maximum permissible total aeroplane mass at the start of the take-off run.
- (e) Passenger classification.
  - 1. Adults, male and female, are defined as persons of an age of 12 years and above.
  - 2. Children are defined as persons who are of an age of two years and above but who are less than 12 years of age.
  - 3. Infants are defined as persons who are less than two years of age.
- (f) Traffic load. The total mass of passengers, baggage and cargo, including any non-revenue load.

## OPS 1.610

**Loading, mass and balance**

An operator shall specify, in the Operations Manual, the principles and methods involved in the loading and in the mass and balance system that meet the requirements of OPS 1.605. This system must cover all types of intended operations.

## OPS 1.615

**Mass values for crew**

- (a) An operator shall use the following mass values to determine the dry operating mass:
1. actual masses including any crew baggage; or
  2. standard masses, including hand baggage, of 85 kg for flight crew members and 75 kg for cabin crew members; or
  3. other standard masses acceptable to the Authority.
- (b) An operator must correct the dry operating mass to account for any additional baggage. The position of this additional baggage must be accounted for when establishing the centre of gravity of the aeroplane.

## OPS 1.620

**Mass values for passengers and baggage**

- (a) An operator shall compute the mass of passengers and checked baggage using either the actual weighed mass of each person and the actual weighed mass of baggage or the standard mass values specified in Tables 1 to 3 below except where the number of passenger seats available is less than 10. In such cases passenger mass may be established by use of a verbal statement by, or on behalf of, each passenger and adding to it a predetermined constant to account for hand baggage and clothing. The procedure specifying when to select actual or standard masses and the procedure to be followed when using verbal statements must be included in the Operations Manual.
- (b) If determining the actual mass by weighing, an operator must ensure that passengers' personal belongings and hand baggage are included. Such weighing must be conducted immediately prior to boarding and at an adjacent location.
- (c) If determining the mass of passengers using standard mass values, the standard mass values in Tables 1 and 2 below must be used. The standard masses include hand baggage and the mass of any infant below two years of age carried by an adult on one passenger seat. Infants occupying separate passenger seats must be considered as children for the purpose of this subparagraph.
- (d) Mass values for passengers — 20 seats or more
1. Where the total number of passenger seats available on an aeroplane is 20 or more, the standard masses of male and female in Table 1 are applicable. As an alternative, in cases where the total number of passenger seats available is 30 or more, the "all adult" mass values in Table 1 are applicable.
  2. For the purpose of Table 1, holiday charter means a charter flight solely intended as an element of a holiday travel package. The holiday charter mass values apply provided that not more than 5 % of passenger seats installed in the aeroplane are used for the non-revenue carriage of certain categories of passengers.

Table 1

Passenger seats:	20 and more		30 and more
	Male	Female	all adult
All flights except holiday charters	88 kg	70 kg	84 kg
Holiday charters	83 kg	69 kg	76 kg
Children	35 kg	35 kg	35 kg

(e) Mass values for passengers — 19 seats or less.

1. Where the total number of passenger seats available on an aeroplane is 19 or less, the standard masses in Table 2 are applicable.

Table 2

Passenger seats	1-5	6-9	10-19
Male	104 kg	96 kg	92 kg
Female	86 kg	78 kg	74 kg
Children	35 kg	35 kg	35 kg

2. On flights where no hand baggage is carried in the cabin or where hand baggage is accounted for separately, 6 kg may be deducted from the below male and female masses. Articles such as an overcoat, an umbrella, a small hand-bag or purse, reading material or a small camera are not considered as hand baggage for the purpose of this subparagraph.

(f) Mass values for baggage

1. Where the total number of passenger seats available on the aeroplane is 20 or more the standard mass values given in Table 3 are applicable for each piece of checked baggage. For aeroplanes with 19 passenger seats or less, the actual mass of checked baggage, determined by weighing, must be used.
2. For the purpose of Table 3:
  - (i) Domestic flight means a flight with origin and destination within the borders of one State;
  - (ii) Flights within the European region means flights, other than Domestic flights, whose origin and destination are within the area specified in Appendix 1 to OPS 1.620(f); and
  - (iii) Intercontinental flight, other than flights within the European region, means a flight with origin and destination in different continents.

Table 3

**20 or more seats**

Type of flight	Baggage standard mass
Domestic	11 kg
Within the European region	13 kg
Intercontinental	15 kg
All other	13 kg

- (g) If an operator wishes to use standard mass values other than those contained in Tables 1 to 3 above, he must advise the Authority of his reasons and gain its approval in advance. He must also submit for approval a detailed weighing survey plan and apply the statistical analysis method given in Appendix 1 to OPS 1.620 (g). After verification and approval by the Authority of the results of the weighing survey, the revised standard mass values are only applicable to that operator. The revised standard mass values can only be used in circumstances consistent with those under which the survey was conducted. Where revised standard masses exceed those in Tables 1 to 3, then such higher values must be used.
- (h) On any flight identified as carrying a significant number of passengers whose masses, including hand baggage, are expected to exceed the standard passenger mass, an operator must determine the actual mass of such passengers by weighing or by adding an adequate mass increment.
- (i) If standard mass values for checked baggage are used and a significant number of passengers check in baggage that is expected to exceed the standard baggage mass, an operator must determine the actual mass of such baggage by weighing or by adding an adequate mass increment.
- (j) An operator shall ensure that a commander is advised when a non-standard method has been used for determining the mass of the load and that this method is stated in the mass and balance documentation.

## OPS 1.625

**Mass and balance documentation**

(See Appendix 1 to OPS 1.625)

- (a) An operator shall establish mass and balance documentation prior to each flight specifying the load and its distribution. The mass and balance documentation must enable the commander to determine that the load and its distribution is such that the mass and balance limits of the aeroplane are not exceeded. The person preparing the mass and balance documentation must be named on the document. The person supervising the loading of the aeroplane must confirm by signature that the load and its distribution are in accordance with the mass and balance documentation. This document must be acceptable to the commander, his/her acceptance being indicated by countersignature or equivalent. (See also OPS 1.1055 (a)12).
  - (b) An operator must specify procedures for last minute changes to the load.
  - (c) Subject to the approval of the Authority, an operator may use an alternative to the procedures required by paragraphs (a) and (b) above.
-

*Appendix 1 to OPS 1.605***Mass and Balance — General**

(See OPS 1.605)

## (a) Determination of the dry operating mass of an aeroplane

## 1. Weighing of an aeroplane

- (i) New aeroplanes are normally weighed at the factory and are eligible to be placed into operation without reweighing if the mass and balance records have been adjusted for alterations or modifications to the aeroplane. Aeroplanes transferred from one operator with an approved mass control programme to another operator with an approved programme need not be weighed prior to use by the receiving operator unless more than four years have elapsed since the last weighing.
- (ii) The individual mass and centre of gravity (CG) position of each aeroplane shall be re-established periodically. The maximum interval between two weighings must be defined by the operator and must meet the requirements of OPS 1.605 (b). In addition, the mass and the CG of each aeroplane shall be re-established either by:
  - (A) Weighing; or
  - (B) Calculation, if the operator is able to provide the necessary justification to prove the validity of the method of calculation chosen, whenever the cumulative changes to the dry operating mass exceed  $\pm 0,5 \%$  of the maximum landing mass or the cumulative change in CG position exceeds  $0,5 \%$  of the mean aerodynamic chord.

## 2. Fleet mass and CG position

- (i) For a fleet or group of aeroplanes of the same model and configuration, an average dry operating mass and CG position may be used as the fleet mass and CG position, provided that the dry operating masses and CG positions of the individual aeroplanes meet the tolerances specified in subparagraph (ii) below. Furthermore, the criteria specified in subparagraphs (iii), (iv) and (a)3 below are applicable.
- (ii) Tolerances
  - (A) If the dry operating mass of any aeroplane weighed, or the calculated dry operating mass of any aeroplane of a fleet, varies by more than  $\pm 0,5 \%$  of the maximum structural landing mass from the established dry operating fleet mass or the CG position varies by more than  $\pm 0,5 \%$  of the mean aerodynamic chord from the fleet CG, that aeroplane shall be omitted from that fleet. Separate fleets may be established, each with differing fleet mean masses.
  - (B) In cases where the aeroplane mass is within the dry operating fleet mass tolerance but its CG position falls outside the permitted fleet tolerance, the aeroplane may still be operated under the applicable dry operating fleet mass but with an individual CG position.
  - (C) If an individual aeroplane has, when compared with other aeroplanes of the fleet, a physical, accurately accountable difference (e.g. galley or seat configuration), that causes exceedance of the fleet tolerances, this aeroplane may be maintained in the fleet provided that appropriate corrections are applied to the mass and/or CG position for that aeroplane.
  - (D) Aeroplanes for which no mean aerodynamic chord has been published must be operated with their individual mass and CG position values or must be subjected to a special study and approval.
- (iii) Use of fleet values
  - (A) After the weighing of an aeroplane, or if any change occurs in the aeroplane equipment or configuration, the operator must verify that this aeroplane falls within the tolerances specified in subparagraph 2.(ii) above.
  - (B) Aeroplanes which have not been weighed since the last fleet mass evaluation can still be kept in a fleet operated with fleet values, provided that the individual values are revised by computation and stay within the tolerances defined in subparagraph 2(ii) above. If these individual values no longer fall within the permitted tolerances, the operator must either determine new fleet values fulfilling the conditions of subparagraphs 2(i) and 2(ii) above, or operate the aeroplanes not falling within the limits with their individual values.

(C) To add an aeroplane to a fleet operated with fleet values, the operator must verify by weighing or computation that its actual values fall within the tolerances specified in subparagraph 2(ii) above.

(iv) To comply with subparagraph 2(i) above, the fleet values must be updated at least at the end of each fleet mass evaluation.

### 3. Number of aeroplanes to be weighed to obtain fleet values

(i) If “n” is the number of aeroplanes in the fleet using fleet values, the operator must at least weigh, in the period between two fleet mass evaluations, a certain number of aeroplanes defined in the Table below:

Number of aeroplanes in the fleet	Minimum number of weighings
2 or 3	N
4 to 9	$(n + 3)/2$
10 or more	$(n + 51)/10$

(ii) In choosing the aeroplanes to be weighed, aeroplanes in the fleet which have not been weighed for the longest time should be selected.

(iii) The interval between two fleet mass evaluations must not exceed 48 months.

### 4. Weighing procedure

(i) The weighing must be accomplished either by the manufacturer or by an approved maintenance organisation.

(ii) Normal precautions must be taken consistent with good practices such as:

(A) checking for completeness of the aeroplane and equipment;

(B) determining that fluids are properly accounted for;

(C) ensuring that the aeroplane is clean; and

(D) ensuring that weighing is accomplished in an enclosed building.

(iii) Any equipment used for weighing must be properly calibrated, zeroed, and used in accordance with the manufacturer's instructions. Each scale must be calibrated either by the manufacturer, by a civil department of weights and measures or by an appropriately authorised organisation within two years or within a time period defined by the manufacturer of the weighing equipment, whichever is less. The equipment must enable the mass of the aeroplane to be established accurately.

(b) Special standard masses for the traffic load. In addition to standard masses for passengers and checked baggage, an operator can submit for approval to the Authority standard masses for other load items.

### (c) Aeroplane loading

1. An operator must ensure that the loading of its aeroplanes is performed under the supervision of qualified personnel.

2. An operator must ensure that the loading of the freight is consistent with the data used for the calculation of the aeroplane mass and balance.

3. An operator must comply with additional structural limits such as the floor strength limitations, the maximum load per running metre, the maximum mass per cargo compartment, and/or the maximum seating limits.



(d) Centre of gravity limits

1. Operational CG envelope. Unless seat allocation is applied and the effects of the number of passengers per seat row, of cargo in individual cargo compartments and of fuel in individual tanks is accounted for accurately in the balance calculation, operational margins must be applied to the certificated centre of gravity envelope. In determining the CG margins, possible deviations from the assumed load distribution must be considered. If free seating is applied, the operator must introduce procedures to ensure corrective action by flight or cabin crew if extreme longitudinal seat selection occurs. The CG margins and associated operational procedures, including assumptions with regard to passenger seating, must be acceptable to the Authority.
  2. In-flight centre of gravity. Further to subparagraph (d)1 above, the operator must show that the procedures fully account for the extreme variation in CG travel during flight caused by passenger/crew movement and fuel consumption/transfer.
-

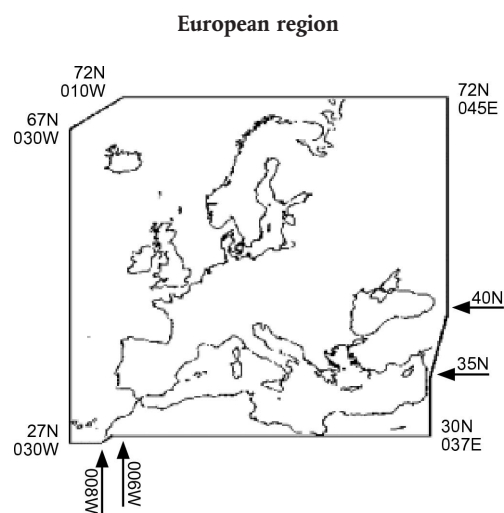
*Appendix 1 to OPS 1.620 (f)***Definition of the area for flights within the European region**

For the purposes of OPS 1.620 (f), flights within the European region, other than domestic flights, are flights conducted within the area bounded by rhumb lines between the following points:

— N7200	E04500
— N4000	E04500
— N3500	E03700
— N3000	E03700
— N3000	W00600
— N2700	W00900
— N2700	W03000
— N6700	W03000
— N7200	W01000
— N7200	E04500

as depicted in Figure 1 below:

Figure 1



## Appendix 1 to OPS 1.620 (g)

**Procedure for establishing revised standard mass values for passengers and baggage**

## (a) Passengers

1. Weight sampling method. The average mass of passengers and their hand baggage must be determined by weighing, taking random samples. The selection of random samples must by nature and extent be representative of the passenger volume, considering the type of operation, the frequency of flights on various routes, in/outbound flights, applicable season and seat capacity of the aeroplane.
2. Sample size. The survey plan must cover the weighing of at least the greatest of:
  - (i) A number of passengers calculated from a pilot sample, using normal statistical procedures and based on a relative confidence range (accuracy) of 1 % for all adult and 2 % for separate male and female average masses; and
  - (ii) For aeroplanes:
    - (A) with a passenger seating capacity of 40 or more, a total of 2 000 passengers; or
    - (B) with a passenger seating capacity of less than 40, a total number of 50 x (the passenger seating capacity).
3. Passenger masses. Passenger masses must include the mass of the passengers' belongings which are carried when entering the aeroplane. When taking random samples of passenger masses, infants shall be weighted together with the accompanying adult (See also OPS 1.620 (c) (d) and (e)).
4. Weighing location. The location for the weighing of passengers shall be selected as close as possible to the aeroplane, at a point where a change in the passenger mass by disposing of or by acquiring more personal belongings is unlikely to occur before the passengers board the aeroplane.
5. Weighing machine. The weighing machine to be used for passenger weighing shall have a capacity of at least 150 kg. The mass shall be displayed at minimum graduations of 500 g. The weighing machine must be accurate to within 0,5 % or 200 g whichever is the greater.
6. Recording of mass values. For each flight included in the survey the mass of the passengers, the corresponding passenger category (i.e. male/female/children) and the flight number must be recorded.

- (b) Checked baggage. The statistical procedure for determining revised standard baggage mass values based on average baggage masses of the minimum required sample size is basically the same as for passengers and as specified in subparagraph (a)1.. For baggage, the relative confidence range (accuracy) amounts to 1 %. A minimum of 2 000 pieces of checked baggage must be weighed.

## (c) Determination of revised standard mass values for passengers and checked baggage

1. To ensure that, in preference to the use of actual masses determined by weighing, the use of revised standard mass values for passengers and checked baggage does not adversely affect operational safety, a statistical analysis must be carried out. Such an analysis will generate average mass values for passengers and baggage as well as other data.
2. On aeroplanes with 20 or more passenger seats, these averages apply as revised standard male and female mass values.
3. On smaller aeroplanes, the following increments must be added to the average passenger mass to obtain the revised standard mass values:

Number of passenger seats	Required mass increment
1-5 inclusive	16 kg
6-9 inclusive	8 kg
10-19 inclusive	4 kg

Alternatively, all adult revised standard (average) mass values may be applied on aeroplanes with 30 or more passenger seats. Revised standard (average) checked baggage mass values are applicable to aeroplanes with 20 or more passenger seats.

4. Operators have the option to submit a detailed survey plan to the Authority for approval and subsequently a deviation from the revised standard mass value provided this deviating value is determined by use of the procedure explained in this Appendix. Such deviations must be reviewed at intervals not exceeding five years.
  5. All adult revised standard mass values must be based on a male/female ratio of 80/20 in respect of all flights except holiday charters which are 50/50. If an operator wishes to obtain approval for use of a different ratio on specific routes or flights then data must be submitted to the Authority showing that the alternative male/female ratio is conservative and covers at least 84 % of the actual male/female ratios on a sample of at least 100 representative flights.
  6. The average mass values found are rounded to the nearest whole number in kg. Checked baggage mass values are rounded to the nearest 0,5 kg figure, as appropriate.
-

*Appendix 1 to OPS 1.625***Mass and Balance Documentation**

## (a) Mass and balance documentation

## 1. Contents

## (i) The mass and balance documentation must contain the following information:

- (A) the aeroplane registration and type;
- (B) the flight identification number and date;
- (C) the identity of the commander;
- (D) the identity of the person who prepared the document;
- (E) the dry operating mass and the corresponding CG of the aeroplane;
- (F) the mass of the fuel at take-off and the mass of trip fuel;
- (G) the mass of consumables other than fuel;
- (H) the components of the load including passengers, baggage, freight and ballast;
- (I) the take-off mass, landing mass and zero fuel mass;
- (J) the load distribution;
- (K) the applicable aeroplane CG positions; and
- (L) the limiting mass and CG values.

## (ii) Subject to the approval of the Authority, an operator may omit some of this Data from the mass and balance documentation.

## 2. Last minute change. If any last minute change occurs after the completion of the mass and balance documentation, this must be brought to the attention of the commander and the last minute change must be entered on the mass and balance documentation. The maximum allowed change in the number of passengers or hold load acceptable as a last minute change must be specified in the Operations Manual. If this number is exceeded, new mass and balance documentation must be prepared.

- (b) Computerised systems. Where mass and balance documentation is generated by a computerised mass and balance system, the operator must verify the integrity of the output data. He must establish a system to check that amendments of his input data are incorporated properly in the system and that the system is operating correctly on a continuous basis by verifying the output data at intervals not exceeding 6 months.
  - (c) Onboard mass and balance systems. An operator must obtain the approval of the Authority if he wishes to use an onboard mass and balance computer system as a primary source for despatch.
  - (d) Datalink. When mass and balance documentation is sent to aeroplanes via datalink, a copy of the final mass and balance documentation as accepted by the commander must be available on the ground.
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## SUBPART K

## INSTRUMENTS AND EQUIPMENT

## OPS 1.630

**General introduction**

- (a) An operator shall ensure that a flight does not commence unless the instruments and equipment required under this Subpart are:
1. approved, except as specified in subparagraph (c), and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and airworthiness requirements; and
  2. in operable condition for the kind of operation being conducted except as provided in the MEL (OPS 1.030 refers).
- (b) Instruments and equipment minimum performance standards are those prescribed in the applicable European Technical Standard Orders (ETSO) as listed in applicable Specifications on European Technical Standard Orders (CS-TSO), unless different performance standards are prescribed in the operational or airworthiness codes. Instruments and equipment complying with design and performance specifications other than ETSO on the date of OPS implementation may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Instruments and equipment that have already been approved do not need to comply with a revised ETSO or a revised specification, other than ETSO, unless a retroactive requirement is prescribed.
- (c) The following items shall not be required to have an equipment approval:
1. fuses referred to in OPS 1.635;
  2. electric torches referred to in OPS 1.640 (a)4;
  3. an accurate time piece referred to in OPS 1.650 (b) and 1.652 (b);
  4. chart holder referred to in OPS 1.652 (n).
  5. first-aid kits referred to in OPS 1.745;
  6. emergency medical kit referred to in OPS 1.755;
  7. megaphones referred to in OPS 1.810;
  8. survival and pyrotechnic signalling equipment referred to in OPS 1.835 (a) and (c); and
  9. sea anchors and equipment for mooring, anchoring or manoeuvring seaplanes and amphibians on water referred to in OPS 1.840;
  10. child restraint devices referred to in OPS 1.730(a)3.
- (d) If equipment is to be used by one flight crew member at his/her station during flight, it must be readily operable from his/her station. When a single item of equipment is required to be operated by more than one flight crew member it must be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.
- (e) Those instruments that are used by any one flight crew member shall be so arranged as to permit the flight crew member to see the indications readily from his/her station, with the minimum practicable deviation from the position and line of vision which he/she normally assumes when looking forward along the flight path. Whenever a single instrument is required in an aeroplane operated by more than 1 flight crew member it must be installed so that the instrument is visible from each applicable flight crew station.

## OPS 1.635

**Circuit protection devices**

An operator shall not operate an aeroplane in which fuses are used unless there are spare fuses available for use in flight equal to at least 10 % of the number of fuses of each rating or three of each rating whichever is the greater.

## OPS 1.640

**Aeroplane operating lights**

An operator shall not operate an aeroplane unless it is equipped with:

- (a) for flight by day:
  - 1. anti-collision light system;
  - 2. lighting supplied from the aeroplane's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the aeroplane;
  - 3. lighting supplied from the aeroplane's electrical system to provide illumination in all passenger compartments; and
  - 4. an electric torch for each required crew member readily accessible to crew members when seated at their designated station.
- (b) for flight by night, in addition to equipment specified in paragraph (a) above:
  - 1. navigation/position lights; and
  - 2. two landing lights or a single light having two separately energised filaments; and
  - 3. lights to conform with the international regulations for preventing collisions at sea if the aeroplane is a seaplane or an amphibian.

## OPS 1.645

**Windshield wipers**

An operator shall not operate an aeroplane with a maximum certificated take-off mass of more than 5 700 kg unless it is equipped at each pilot station with a windshield wiper or equivalent means to maintain a clear portion of the windshield during precipitation.

## OPS 1.650

**Day VFR operations — Flight and navigational instruments and associated equipment**

An operator shall not operate an aeroplane by day in accordance with visual flight rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following subparagraphs:

- (a) a magnetic compass;
- (b) an accurate timepiece showing the time in hours, minutes, and seconds;
- (c) a sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;
- (d) an airspeed indicator calibrated in knots;
- (e) a vertical speed indicator;

- (f) a turn and slip indicator, or a turn coordinator incorporating a slip indicator;
- (g) an attitude indicator;
- (h) a stabilised direction indicator; and
- (i) a means of indicating in the flight crew compartment the outside air temperature calibrated in degrees Celsius.
- (j) For flights which do not exceed 60 minutes duration, which take off and land at the same aerodrome, and which remain within 50 nm of that aerodrome, the instruments prescribed in subparagraphs (f), (g) and (h) above, and subparagraphs (k)4., (k)5. and (k)6. below, may all be replaced by either a turn and slip indicator, or a turn co-ordinator incorporating a slip indicator, or both an attitude indicator and a slip indicator.
- (k) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:
  - 1. a sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;
  - 2. an airspeed indicator calibrated in knots;
  - 3. a vertical speed indicator;
  - 4. a turn and slip indicator, or a turn coordinator incorporating a slip indicator;
  - 5. an attitude indicator; and
  - 6. a stabilised direction indicator.
- (l) Each airspeed indicating system must be equipped with a heated pitot tube or equivalent means for preventing malfunction due to either condensation or icing for:
  - 1. aeroplanes with a maximum certificated take-off mass in excess of 5 700 kg or having a maximum approved passenger seating configuration of more than 9;
  - 2. aeroplanes first issued with an individual certificate of airworthiness on or after 1 April 1999.
- (m) Whenever duplicate instruments are required, the requirement embraces separate displays for each pilot and separate selectors or other associated equipment where appropriate.
- (n) All aeroplanes must be equipped with means for indicating when power is not adequately supplied to the required flight instruments; and
- (o) all aeroplanes with compressibility limitations not otherwise indicated by the required airspeed indicators shall be equipped with a Mach number indicator at each pilot's station.
- (p) An operator shall not conduct Day VFR operations unless the aeroplane is equipped with a headset with boom microphone or equivalent for each flight crew member on flight deck duty.

#### OPS 1.652

##### **IFR or night operations — Flight and navigational instruments and associated equipment**

An operator shall not operate an aeroplane in accordance with instrument flight rules (IFR) or by night in accordance with visual flight rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following subparagraphs:

- (a) a magnetic compass;
- (b) an accurate time-piece showing the time in hours, minutes and seconds;
- (c) two sensitive pressure altimeters calibrated in feet with sub-scale settings, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight; These altimeters must have counter drum-pointer or equivalent presentation.



- (d) an airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including a warning indication of pitot heater failure. The pitot heater failure warning indication requirement does not apply to those aeroplanes with a maximum approved passenger seating configuration of nine or less or a maximum certificated take-off mass of 5 700 kg or less and issued with an individual Certificate of Airworthiness prior to 1 April 1998;
- (e) a vertical speed indicator;
- (f) a turn and slip indicator;
- (g) an attitude indicator;
- (h) a stabilised direction indicator;
- (i) a means of indicating in the flight crew compartment the outside air temperature calibrated in degrees Celsius; and
- (j) two independent static pressure systems, except that for propeller driven aeroplanes with maximum certificated take-off mass of 5 700 kg or less, one static pressure system and one alternate source of static pressure is allowed.
- (k) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:
  - 1. a sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight and which may be one of the two altimeters required by subparagraph (c) above. These altimeters must have counter drum-pointer or equivalent presentation.
  - 2. an airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including a warning indication of pitot heater failure. The pitot heater failure warning indication requirement does not apply to those aeroplanes with a maximum approved passenger seating configuration of nine or less or a maximum certificated take-off mass of 5 700 kg or less and issued with an individual Certificate of Airworthiness prior to 1 April 1998;
  - 3. a vertical speed indicator;
  - 4. a turn and slip indicator;
  - 5. an attitude indicator; and
  - 6. a stabilised direction indicator.
- (l) Those aeroplanes with a maximum certificated take-off mass in excess of 5 700 kg or having a maximum approved passenger seating configuration of more than nine seats must be equipped with an additional, standby, attitude indicator (artificial horizon), capable of being used from either pilot's station, that:
  - 1. is powered continuously during normal operation and, after a total failure of the normal electrical generating system is powered from a source independent of the normal electrical generating system;
  - 2. provides reliable operation for a minimum of 30 minutes after total failure of the normal electrical generating system, taking into account other loads on the emergency power supply and operational procedures;
  - 3. operates independently of any other attitude indicating system;
  - 4. is operative automatically after total failure of the normal electrical generating system; and
  - 5. is appropriately illuminated during all phases of operation, except for aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, already registered in a Member State on 1 April 1995, equipped with a standby attitude indicator in the left-hand instrument panel.
- (m) In complying with subparagraph (l) above, it must be clearly evident to the flight crew when the standby attitude indicator, required by that subparagraph, is being operated by emergency power. Where the standby attitude indicator has its own dedicated power supply there shall be an associated indication, either on the instrument or on the instrument panel, when this supply is in use.
- (n) A chart holder in an easily readable position which can be illuminated for night operations.

- (o) If the standby attitude instrument system is certificated according to CS 25.1303(b)(4) or equivalent, the turn and slip indicators may be replaced by slip indicators.
- (p) Whenever duplicate instruments are required, the requirement embraces separate displays for each pilot and separate selectors or other associated equipment where appropriate;
- (q) All aeroplanes must be equipped with means for indicating when power is not adequately supplied to the required flight instruments; and
- (r) All aeroplanes with compressibility limitations not otherwise indicated by the required airspeed indicators shall be equipped with a Mach number indicator at each pilot's station.
- (s) An operator shall not conduct IFR or night operations unless the aeroplane is equipped with a headset with boom microphone or equivalent for each flight crew member on flight deck duty and a transmit button on the control wheel for each required pilot.

OPS 1.655

**Additional equipment for single pilot operation under IFR or at night**

An operator shall not conduct single pilot IFR operations unless the aeroplane is equipped with an autopilot with at least altitude hold and heading mode.

OPS 1.660

**Altitude alerting system**

- (a) An operator shall not operate a turbine propeller powered aeroplane with a maximum certificated take-off mass in excess of 5 700 kg or having a maximum approved passenger seating configuration of more than nine seats or a turbojet powered aeroplane unless it is equipped with an altitude alerting system capable of:

1. alerting the flight crew upon approaching a preselected altitude; and
2. alerting the flight crew by at least an aural signal, when deviating above or below a preselected altitude,

except for aeroplanes with a maximum certificated take-off mass of 5 700 kg or less having a maximum approved passenger seating configuration of more than 9 and first issued with an individual certificate of airworthiness before 1 April 1972 and already registered in a Member State on 1 April 1995.

OPS 1.665

**Ground proximity warning system and terrain awareness warning system**

- (a) An operator shall not operate a turbine powered aeroplane having a maximum certificated take-off mass in excess of 5 700 kg or a maximum approved passenger seating configuration of more than nine unless it is equipped with a ground proximity warning system that includes a predictive terrain hazard warning function (terrain awareness and warning system — TAWS).
- (b) The ground proximity warning system must automatically provide, by means of aural signals, which may be supplemented by visual signals, timely and distinctive warning to the flight crew of sink rate, ground proximity, altitude loss after take-off or go-around, incorrect landing configuration and downward glide slope deviation.
- (c) The terrain awareness and warning system must automatically provide the flight crew, by means of visual and aural signals and a terrain awareness display, with sufficient alerting time to prevent controlled flight into terrain events, and provided a forward looking capability and terrain clearance floor.

## OPS 1.668

**Airborne collision avoidance system**

An operator shall not operate a turbine powered aeroplane having a maximum certificated take-off mass in excess of 5 700 kg or a maximum approved passenger seating configuration of more than 19 unless it is equipped with an airborne collision avoidance system with a minimum performance level of at least ACAS II.

## OPS 1.670

**Airborne weather radar equipment**

- (a) An operator shall not operate:
1. a pressurised aeroplane; or
  2. an unpressurised aeroplane which has a maximum certificated take-off mass of more than 5 700 kg; or
  3. an unpressurised aeroplane having a maximum approved passenger seating configuration of more than nine seats, unless it is equipped with airborne weather radar equipment whenever such an aeroplane is being operated at night or in instrument meteorological conditions in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may be expected to exist along the route.
- (b) For propeller driven pressurised aeroplanes having a maximum certificated take-off mass not exceeding 5 700 kg with a maximum approved passenger seating configuration not exceeding nine seats the airborne weather radar equipment may be replaced by other equipment capable of detecting thunderstorms and other potentially hazardous weather conditions, regarded as detectable with airborne weather radar equipment, subject to approval by the Authority.

## OPS 1.675

**Equipment for operations in icing conditions**

- (a) An operator shall not operate an aeroplane in expected or actual icing conditions unless it is certificated and equipped to operate in icing conditions.
- (b) An operator shall not operate an aeroplane in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice. Any illumination that is used must be of a type that will not cause glare or reflection that would handicap crew members in the performance of their duties.

## OPS 1.680

**Cosmic radiation detection equipment**

- (a) An operator shall not operate an aeroplane above 15 000 m (49 000 ft) unless:
1. it is equipped with an instrument to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionising and neutron radiation of galactic and solar origin) and the cumulative dose on each flight, or
  2. a system of on-board quarterly radiation sampling acceptable to the Authority is established.

## OPS 1.685

**Flight crew interphone system**

An operator shall not operate an aeroplane on which a flight crew of more than one is required unless it is equipped with a flight crew interphone system, including headsets and microphones, not of a handheld type, for use by all members of the flight crew.

## OPS 1.690

**Crew member interphone system**

- (a) An operator shall not operate an aeroplane with a maximum certificated take-off mass exceeding 15 000 kg or having a maximum approved passenger seating configuration of more than 19 unless it is equipped with a crew member interphone system except for aeroplanes first issued with an individual certificate of airworthiness before 1 April 1965 and already registered in a Member State on 1 April 1995.
- (b) The crew member interphone system required by this paragraph must:
1. operate independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices;
  2. provide a means of two-way communication between the flight crew compartment and:
    - (i) each passenger compartment;
    - (ii) each galley located other than on a passenger deck level; and
    - (iii) each remote crew compartment that is not on the passenger deck and is not easily accessible from a passenger compartment;
  3. be readily accessible for use from each of the required flight crew stations in the flight crew compartment;
  4. be readily accessible for use at required cabin crew member stations close to each separate or pair of floor level emergency exits;
  5. have an alerting system incorporating aural or visual signals for use by flight crew members to alert the cabin crew and for use by cabin crew members to alert the flight crew;
  6. have a means for the recipient of a call to determine whether it is a normal call or an emergency call; and
  7. provide on the ground a means of two-way communication between ground personnel and at least two flight crew members.

## OPS 1.695

**Public address system**

- (a) An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 19 unless a public address system is installed.
- (b) The public address system required by this paragraph must:
1. operate independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices;
  2. be readily accessible for immediate use from each required flight crew member station;
  3. for each required floor level passenger emergency exit which has an adjacent cabin crew seat, have a microphone which is readily accessible to the seated cabin crew member, except that one microphone may serve more than one exit, provided the proximity of the exits allows unassisted verbal communication between seated cabin crew members;
  4. be capable of operation within 10 seconds by a cabin crew member at each of those stations in the compartment from which its use is accessible; and
  5. be audible and intelligible at all passenger seats, toilets and cabin crew seats and work stations.

## OPS 1.700

**Cockpit voice recorders — 1**

- (a) An operator shall not operate an aeroplane first issued with an individual Certificate of Airworthiness, on or after 1 April 1998, which:
1. is multi-engine turbine powered and has a maximum approved passenger seating configuration of more than nine; or
  2. has a maximum certificated take-off mass over 5 700 kg,
- unless it is equipped with a cockpit voice recorder which, with reference to a time scale, records:
- (i) voice communications transmitted from or received on the flight deck by radio;
  - (ii) the aural environment of the flight deck, including without interruption, the audio signals received from each boom and mask microphone in use;
  - (iii) voice communications of flight crew members on the flight deck using the aeroplane's interphone system;
  - (iv) voice or audio signals identifying navigation or approach aids introduced into a headset or speaker; and
  - (v) voice communications of flight crew members on the flight deck using the public address system, if installed.
- (b) The cockpit voice recorder shall be capable of retaining information recorded during at least the last two hours of its operation except that, for those aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, this period may be reduced to 30 minutes.
- (c) The cockpit voice recorder must start automatically to record prior to the aeroplane moving under its own power and continue to record 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 cockpit voice recorder must start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.
- (d) The cockpit voice recorder must have a device to assist in locating that recorder in water.

## OPS 1.705

**Cockpit voice recorders — 2**

- (a) An operator shall not operate any multi-engined turbine aeroplane first issued with an individual Certificate of Airworthiness, on or after 1 January 1990 up to and including 31 March 1998 which has a maximum certificated take-off mass of 5 700 kg or less and a maximum approved passenger seating configuration of more than nine, unless it is equipped with a cockpit voice recorder which records:
1. voice communications transmitted from or received on the flight deck by radio;
  2. the aural environment of the flight deck, including where practicable, without interruption, the audio signals received from each boom and mask microphone in use;
  3. voice communications of flight crew members on the flight deck using the aeroplane's interphone system;
  4. voice or audio signals identifying navigation or approach aids introduced into a headset or speaker; and
  5. voice communications of flight crew members on the flight deck using the public address system, if installed.
- (b) The cockpit voice recorder shall be capable of retaining information recorded during at least the last 30 minutes of its operation.

- (c) The cockpit voice recorder must start to record prior to the aeroplane moving under its own power and continue to record 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 cockpit voice recorder must start to record as early as possible during the cockpit checks, prior to the flight until the cockpit checks immediately following engine shutdown at the end of the flight.
- (d) The cockpit voice recorder must have a device to assist in locating that recorder in water.

OPS 1.710

**Cockpit voice recorders — 3**

- (a) An operator shall not operate any aeroplane with a maximum certificated take-off mass over 5 700 kg first issued with an individual certificate of airworthiness, before 1 April 1998 unless it is equipped with a cockpit voice recorder which records:
  - 1. voice communications transmitted from or received on the flight deck by radio;
  - 2. the aural environment of the flight deck;
  - 3. voice communications of flight crew members on the flight deck using the aeroplane's interphone system;
  - 4. voice or audio signals identifying navigation or approach aids introduced into a headset or speaker; and
  - 5. voice communications of flight crew members on the flight deck using the public address system, if installed.
- (b) The cockpit voice recorder shall be capable of retaining information recorded during at least the last 30 minutes of its operation.
- (c) The cockpit voice recorder must start to record prior to the aeroplane moving under its own power and continue to record until the termination of the flight when the aeroplane is no longer capable of moving under its own power.
- (d) The cockpit voice recorder must have a device to assist in locating that recorder in water.

OPS 1.715

**Flight data recorders — 1**

(See Appendix 1 to OPS 1.715)

- (a) An operator shall not operate any aeroplane first issued with an individual Certificate of Airworthiness on or after 1 April 1998 which:
  - 1. is multi-engine turbine powered and has a maximum approved passenger seating configuration of more than nine;  
or
  - 2. has a maximum certificated take-off mass over 5 700 kg,unless it is equipped with a flight data recorder that uses a digital method of recording and storing data and a method of readily retrieving that data from the storage medium is available.
- (b) The flight data recorder shall be capable of retaining the data recorded during at least the last 25 hours of its operation except that, for those aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, this period may be reduced to 10 hours.
- (c) The flight data recorder must, with reference to a timescale, record:
  - 1. the parameters listed in Tables A1 or A2 of Appendix 1 to OPS 1.715 as applicable;
  - 2. for those aeroplanes with a maximum certificated take-off mass over 27 000 kg, the additional parameters listed in Table B of Appendix 1 to OPS 1.715;

3. for aeroplanes specified in (a) above, the flight data recorder must record any dedicated parameters relating to novel or unique design or operational characteristics of the aeroplane as determined by the Authority during type or supplemental type certification; and
4. for aeroplanes equipped with electronic display system the parameters listed in Table C of Appendix 1 to OPS 1.715, except that, for aeroplanes first issued with an individual Certificate of Airworthiness before 20 August 2002 those parameters for which:
  - (i) the sensor is not available; or
  - (ii) the aeroplane system or equipment generating the data needs to be modified; or
  - (iii) the signals are incompatible with the recording system;
 do not need to be recorded if acceptable to the Authority.
- (d) Data must be obtained from aeroplane sources which enable accurate correlation with information displayed to the flight crew.
- (e) The flight data recorder must start automatically to record the data prior to the aeroplane being capable of moving under its own power and must stop automatically after the aeroplane is incapable of moving under its own power.
- (f) The flight data recorder must have a device to assist in locating that recorder in water.
- (g) Aeroplanes first issued with an individual Certificate of Airworthiness on or after 1 April 1998, but not later than 1 April 2001 may not be required to comply with OPS 1.715(c) if approved by the Authority, provided that:
  1. compliance with OPS 1.715(c) cannot be achieved without extensive modification to the aeroplane systems and equipment other than the flight data recorder system; and
  2. the aeroplane complies with OPS 1.720(c) except that parameter 15b in Table A of Appendix 1 to OPS 1.720 need not to be recorded.

## OPS 1.720

**Flight data recorders — 2**

(See Appendix 1 to OPS 1.720)

- (a) An operator shall not operate any aeroplane first issued with an individual certificate of airworthiness on or after 1 June 1990 up to and including 31 March 1998 which has a maximum certificated take-off mass over 5 700 kg unless it is equipped with a flight data recorder that uses a digital method of recording and storing data and a method of readily retrieving that data from the storage medium is available.
- (b) The flight data recorder shall be capable of retaining the data recorded during at least the last 25 hours of its operation.
- (c) The flight data recorder must, with reference to a timescale, record:
  1. the parameters listed in Table A of Appendix 1 to OPS 1.720; and
  2. for those aeroplanes with a maximum certificated take-off mass over 27 000 kg the additional parameters listed in Table B of Appendix 1 to OPS 1.720.
- (d) For those aeroplanes having a maximum certificated take-off mass of 27 000 kg or below, if acceptable to the Authority, parameters 14 and 15b of Table A of Appendix 1 to OPS 1.720 need not be recorded, when any of the following conditions are met:
  1. the sensor is not readily available,
  2. sufficient capacity is not available in the flight recorder system,
  3. a change is required in the equipment that generates the data.

- (e) For those aeroplanes having a maximum certificated take-off mass over 27 000 kg, if acceptable to the Authority, the following parameters need not be recorded: 15b of Table A of Appendix 1 to OPS 1.720, and 23, 24, 25, 26, 27, 28, 29, 30 and 31 of Table B of Appendix 1, if any of the following conditions are met:
1. the sensor is not readily available,
  2. sufficient capacity is not available in the flight data recorder system,
  3. a change is required in the equipment that generates the data,
  4. for navigational data (NAV frequency selection, DME distance, latitude, longitude, ground speed and drift) the signals are not available in digital form.
- (f) Individual parameters that can be derived by calculation from the other recorded parameters, need not to be recorded if acceptable to the Authority.
- (g) Data must be obtained from aeroplane sources which enable accurate correlation with information displayed to the flight crew;
- (h) The flight data recorder must start to record the data prior to the aeroplane being capable of moving under its own power and must stop after the aeroplane is incapable of moving under its own power.
- (i) The flight data recorder must have a device to assist in locating that recorder in water.

#### OPS 1.725

#### **Flight data recorders — 3**

(See Appendix 1 to OPS 1.725)

- (a) An operator shall not operate any turbine-engined first issued with an individual Certificate of Airworthiness, before 1 June 1990 which has a maximum certificated take-off mass over 5 700 kg unless it is equipped with a flight data recorder that uses a digital method of recording and storing data and a method of readily retrieving that data from the storage medium is available.
- (b) The flight data recorder shall be capable of retaining the data recorded during at least the last 25 hours of its operation.
- (c) The flight data recorder must, with reference to a timescale, record:
1. the parameters listed in Table A of Appendix 1 to OPS 1.725.
  2. for those aeroplanes with a maximum certificated take-off mass over 27 000 kg that are of a type first type certificated after 30 September 1969, the additional parameters from 6 to 15b of Table B of Appendix 1 to OPS 1.725 of this paragraph. The following parameters need not be recorded, if acceptable to the Authority: 13, 14 and 15b in Table B of Appendix 1 to OPS 1.725 when any of the following conditions are met:
    - (i) the sensor is not readily available,
    - (ii) sufficient capacity is not available in the flight recorder system,
    - (iii) a change is required in the equipment that generates the data; and
  3. When sufficient capacity is available on a flight recorder system, the sensor is readily available and a change is not required in the equipment that generates the data:
    - (i) for aeroplanes first issued with an individual Certificate of Airworthiness on or after 1 January 1989, with a maximum certificated take off mass of over 5 700 kg but not more than 27 000 kg, parameters 6 to 15b of Table B of Appendix 1 to OPS 1.725; and
    - (ii) for aeroplanes first issued with an individual Certificate of Airworthiness on or after 1 January 1987, with a maximum certificated take off mass of over 27 000 kg the remaining parameters of Table B of Appendix 1 to OPS 1.725.



- (d) Individual parameters that can be derived by calculation from the other recorded parameters, need not to be recorded if acceptable to the Authority.
- (e) Data must be obtained from aircraft sources which enable accurate correlation with information displayed to the flight crew.
- (f) The flight data recorder must start to record the data prior to the aeroplane being capable of moving under its own power and must stop after the aeroplane is incapable of moving under its own power.
- (g) The flight data recorder must have a device to assist in locating that recorder in water.

OPS 1.727

**Combination recorder**

- (a) Compliance with Cockpit Voice recorder and flight data recorder requirements may be achieved by:
  - 1. one combination recorder if the aeroplane has to be equipped with a cockpit voice recorder or with a flight data recorder only; or
  - 2. one combination recorder if the aeroplane with a maximum certificated take-off mass of 5 700 kg or less has to be equipped with a cockpit voice recorder and a flight data recorder; or
  - 3. two combination recorders if the aeroplane with a maximum take-off mass over 5 700 kg has to be equipped with a cockpit voice recorder and a flight data recorder.
- (b) A combination recorder is a flight recorder that records:
  - 1. all voice communications and aural environment required by the relevant cockpit voice recorder paragraph; and
  - 2. all parameters required by the relevant flight data recorder paragraph, with the same specifications required by those paragraphs.

OPS 1.730

**Seats, seat safety belts, harnesses and child restraint devices**

- (a) An operator shall not operate an aeroplane unless it is equipped with:
  - 1. a seat or berth for each person who is aged two years or more;
  - 2. a safety belt, with or without a diagonal shoulder strap, or a safety harness for use in each passenger seat for each passenger aged two years or more;
  - 3. a child restraint device, acceptable to the Authority, for each infant;
  - 4. except as provided in subparagraph (c) below, a safety belt with shoulder harness for each flight crew seat and for any seat alongside a pilot's seat incorporating a device which will automatically restrain the occupant's torso in the event of rapid deceleration;
  - 5. except as provided in subparagraph (c) below, a safety belt with shoulder harness for each cabin crew seat and observer's seats. However, this requirement does not preclude use of passenger seats by cabin crew members carried in excess of the required cabin crew complement; and
  - 6. seats for cabin crew members located near required floor level emergency exits except that, if the emergency evacuation of passengers would be enhanced by seating cabin crew members elsewhere, other locations are acceptable. Such seats shall be forward or rearward facing within 15° of the longitudinal axis of the aeroplane.
- (b) All safety belts with shoulder harness must have a single point release.

- (c) A safety belt with a diagonal shoulder strap for aeroplanes with a maximum certificated take-off mass not exceeding 5 700 kg or a safety belt for aeroplanes with a maximum certificated take-off mass not exceeding 2 730 kg may be permitted in place of a safety belt with shoulder harness if it is not reasonably practicable to fit the latter.

*OPS 1.731*

**Fasten seat belt and no smoking signs**

An operator shall not operate an aeroplane in which all passenger seats are not visible from the flight deck, unless it is equipped with a means of indicating to all passengers and cabin crew when seat belts shall be fastened and when smoking is not allowed.

*OPS 1.735*

**Internal doors and curtains**

An operator shall not operate an aeroplane unless the following equipment is installed:

- (a) in an aeroplane with a maximum approved passenger seating configuration of more than 19 passengers, a door between the passenger compartment and the flight deck compartment with a placard "crew only" and a locking means to prevent passengers from opening it without the permission of a member of the flight crew;
- (b) a means for opening each door that separates a passenger compartment from another compartment that has emergency exit provisions. The means for opening must be readily accessible;
- (c) if it is necessary to pass through a doorway or curtain separating the passenger cabin from other areas to reach any required emergency exit from any passenger seat, the door or curtain must have a means to secure it in the open position;
- (d) a placard on each internal door or adjacent to a curtain that is the means of access to a passenger emergency exit, to indicate that it must be secured open during take off and landing; and
- (e) a means for any member of the crew to unlock any door that is normally accessible to passengers and that can be locked by passengers.

*OPS 1.745*

**First-aid kits**

- (a) An operator shall not operate an aeroplane unless it is equipped with first-aid kits, readily accessible for use, to the following scale:

Number of passenger seats installed	Number of first-aid kits required
0 to 99	1
100 to 199	2
200 to 299	3
300 and more	4

- (b) An operator shall ensure that first-aid kits are:
- 1. inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use; and
  - 2. replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant.

## OPS 1.755

**Emergency medical kit**

- (a) An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 30 seats unless it is equipped with an emergency medical kit if any point on the planned route is more than 60 minutes flying time (at normal cruising speed) from an aerodrome at which qualified medical assistance could be expected to be available.
- (b) The commander shall ensure that drugs are not administered except by qualified doctors, nurses or similarly qualified personnel.
- (c) Conditions for carriage
  - 1. The emergency medical kit must be dust and moisture proof and shall be carried under security conditions, where practicable, on the flight deck; and
  - 2. An operator shall ensure that emergency medical kits are:
    - (i) inspected periodically to confirm, to the extent possible, that the contents are maintained in the condition necessary for their intended use; and
    - (ii) replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant.

## OPS 1.760

**First-aid oxygen**

- (a) An operator shall not operate a pressurised aeroplane at altitudes above 25 000 ft, when a cabin crew member is required to be carried, unless it is equipped with a supply of undiluted oxygen for passengers who, for physiological reasons, might require oxygen following a cabin depressurisation. The amount of oxygen shall be calculated using an average flow rate of at least three litres standard temperature pressure dry (STPD)/minute/person and shall be sufficient for the remainder of the flight after cabin depressurisation when the cabin altitude exceeds 8 000 ft but does not exceed 15 000 ft, for at least 2 % of the passengers carried, but in no case for less than one person. There shall be a sufficient number of dispensing units, but in no case less than two, with a means for cabin crew to use the supply. The dispensing units may be of a portable type.
- (b) The amount of first-aid oxygen required for a particular operation shall be determined on the basis of cabin pressure altitudes and flight duration, consistent with the operating procedures established for each operation and route.
- (c) The oxygen equipment provided shall be capable of generating a mass flow to each user of at least four litres per minute, STPD. Means may be provided to decrease the flow to not less than two litres per minute, STPD, at any altitude.

## OPS 1.770

**Supplemental oxygen — pressurised aeroplanes**

(See Appendix 1 to OPS 1.770)

- (a) General
  - 1. An operator shall not operate a pressurised aeroplane at pressure altitudes above 10 000 ft unless supplemental oxygen equipment, capable of storing and dispensing the oxygen supplies required by this paragraph, is provided.
  - 2. The amount of supplemental oxygen required shall be determined on the basis of cabin pressure altitude, flight duration and the assumption that a cabin pressurisation failure will occur at the altitude or point of flight that is most critical from the standpoint of oxygen need, and that, after the failure, the aeroplane will descend in accordance with emergency procedures specified in the Aeroplane Flight Manual to a safe altitude for the route to be flown that will allow continued safe flight and landing.

3. Following a cabin pressurisation failure, the cabin pressure altitude shall be considered the same as the aeroplane pressure altitude, unless it is demonstrated to the Authority that no probable failure of the cabin or pressurisation system will result in a cabin pressure altitude equal to the aeroplane pressure altitude. Under these circumstances, the demonstrated maximum cabin pressure altitude may be used as a basis for determination of oxygen supply.
- (b) Oxygen equipment and supply requirements
1. Flight crew members
    - (i) Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Appendix 1. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crew members on flight deck duty for the purpose of oxygen supply. Flight deck seat occupants, not supplied by the flight crew source, are to be considered as passengers for the purpose of oxygen supply.
    - (ii) Flight crew members, not covered by subparagraph (b)1(i) above, are to be considered as passengers for the purpose of oxygen supply.
    - (iii) Oxygen masks shall be located so as to be within the immediate reach of flight crew members whilst at their assigned duty station.
    - (iv) Oxygen masks for use by flight crew members in pressurised aeroplanes operating above 25 000 ft shall be a quick donning type of mask.
  2. Cabin crew members, additional crew members and passengers
    - (i) Cabin crew members and passengers shall be supplied with supplemental oxygen in accordance with Appendix 1, except when subparagraph (v) below applies. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.
    - (ii) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft shall be provided with sufficient spare outlets and masks and/or sufficient portable oxygen units with masks for use by all required cabin crew members. The spare outlets and/or portable oxygen units are to be distributed evenly throughout the cabin to ensure immediate availability of oxygen to each required cabin crew member regardless of his/her location at the time of cabin pressurisation failure.
    - (iii) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft shall be provided with an oxygen dispensing unit connected to oxygen supply terminals immediately available to each occupant, wherever seated. The total number of dispensing units and outlets shall exceed the number of seats by at least 10 %. The extra units are to be evenly distributed throughout the cabin.
    - (iv) Aeroplanes intended to be operated at pressure altitudes above 25 000 ft or which, if operated at or below 25 000 ft, cannot descend safely within four minutes to 13 000 ft, and for which the individual certificate of airworthiness was first issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment immediately available to each occupant, wherever seated. The total number of dispensing units and outlets shall exceed the number of seats by at least 10 %. The extra units are to be evenly distributed throughout the cabin.
    - (v) The oxygen supply requirements, as specified in Appendix 1, for aeroplanes not certificated to fly at altitudes above 25 000 ft, may be reduced to the entire flight time between 10 000 ft and 13 000 ft cabin pressure altitudes for all required cabin crew members and for at least 10 % of the passengers if, at all points along the route to be flown, the aeroplane is able to descend safely within four minutes to a cabin pressure altitude of 13 000 ft.

OPS 1.775

**Supplemental oxygen — Non-pressurised aeroplanes**

(See Appendix 1 to OPS 1.775)

(a) General

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

2. The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.
3. An aeroplane intended to be operated at pressure altitudes above 10 000 ft shall be provided with equipment capable of storing and dispensing the oxygen supplies required.

(b) Oxygen supply requirements

1. Flight crew members. Each member of the flight crew on flight deck duty shall be supplied with supplemental oxygen in accordance with Appendix 1. If all occupants of flight deck seats are supplied from the flight crew source of oxygen supply then they shall be considered as flight crew members on flight deck duty for the purpose of oxygen supply.
2. Cabin crew members, additional crew members and passengers. Cabin crew members and passengers shall be supplied with oxygen in accordance with Appendix 1. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.

OPS 1.780

**Crew protective breathing equipment**

- (a) An operator shall not operate a pressurised aeroplane or an unpressurised aeroplane with a maximum certificated take-off mass exceeding 5 700 kg or having a maximum approved seating configuration of more than 19 seats unless:
  1. it has equipment to protect the eyes, nose and mouth of each flight crew member while on flight deck duty and to provide oxygen for a period of not less than 15 minutes. The supply for Protective Breathing Equipment (PBE) may be provided by the supplemental oxygen required by OPS 1.770 (b)1 or OPS 1.775 (b)1. In addition, when the flight crew is more than one and a cabin crew member is not carried, portable PBE must be carried to protect the eyes, nose and mouth of one member of the flight crew and to provide breathing gas for a period of not less than 15 minutes; and
  2. it has sufficient portable PBE to protect the eyes, nose and mouth of all required cabin crew members and to provide breathing gas for a period of not less than 15 minutes.
- (b) PBE intended for flight crew use must be conveniently located on the flight deck and be easily accessible for immediate use by each required flight crew member at their assigned duty station.
- (c) PBE intended for cabin crew use must be installed adjacent to each required cabin crew member duty station.
- (d) An additional, easily accessible portable PBE must be provided and located at or adjacent to the hand fire extinguishers required by OPS 1.790 (c) and (d) except that, where the fire extinguisher is located inside a cargo compartment, the PBE must be stowed outside but adjacent to the entrance to that compartment.
- (e) PBE while in use must not prevent communication where required by OPS 1.685, OPS 1.690, OPS 1.810 and OPS 1.850.

OPS 1.790

**Hand fire extinguishers**

An operator shall not operate an aeroplane unless hand fire extinguishers are provided for use in crew, passenger and, as applicable, cargo compartments and galleys in accordance with the following:

- (a) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used and, for personnel compartments, must minimise the hazard of toxic gas concentration;

- (b) At least one hand fire extinguisher, containing Halon 1211 (bromochlorodifluoro-methane,  $\text{CBrClF}_2$ ), or equivalent as the extinguishing agent, must be conveniently located on the flight deck for use by the flight crew;
- (c) At least one hand fire extinguisher must be located in, or readily accessible for use in, each galley not located on the main passenger deck;
- (d) 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 compartment that is accessible to crew members in flight; and
- (e) At least the following number of hand fire extinguishers must be conveniently located in the passenger compartment(s):

Maximum approved passenger seating configuration	Number of Extinguishers
7 to 30	1
31 to 60	2
61 to 200	3
201 to 300	4
301 to 400	5
401 to 500	6
501 to 600	7
601 or more	8

When two or more extinguishers are required, they must be evenly distributed in the passenger compartment.

- (f) At least one of the required fire extinguishers located in the passenger compartment of an aeroplane with a maximum approved passenger seating configuration of at least 31, and not more than 60, and at least two of the fire extinguishers located in the passenger compartment of an aeroplane with a maximum approved passenger seating configuration of 61 or more must contain Halon 1211 (bromochlorodi-fluoromethane,  $\text{CBrClF}_2$ ), or equivalent as the extinguishing agent.

#### OPS 1.795

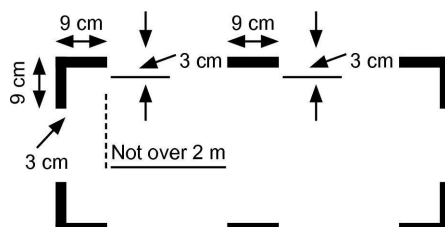
##### Crash axes and crowbars

- (a) An operator shall not operate an aeroplane with a maximum certificated take-off mass exceeding 5 700 kg or having a maximum approved passenger seating configuration of more than nine seats unless it is equipped with at least one crash axe or crowbar located on the flight deck. If the maximum approved passenger seating configuration is more than 200 an additional crash axe or crowbar must be carried and located in or near the most rearward galley area.
- (b) Crash axes and crowbars located in the passenger compartment must not be visible to passengers.

#### OPS 1.800

##### Marking of break-in points

An operator shall ensure that, if designated 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. The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background. If the corner markings are more than two metres apart, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than two metres between adjacent marks.



## OPS 1.805

**Means for emergency evacuation**

- (a) An operator shall not operate an aeroplane with passenger emergency exit sill heights:
1. which are more than 1,83 metres (6 feet) above the ground with the aeroplane on the ground and the landing gear extended; or
  2. which would be more than 1,83 metres (6 feet) above the ground after the collapse of, or failure to extend of, one or more legs of the landing gear and for which a Type Certificate was first applied for on or after 1 April 2000, unless it has equipment or devices available at each exit, where subparagraphs 1. or 2. apply, to enable passengers and crew to reach the ground safely in an emergency.
- (b) Such equipment or devices need not be provided at overwing exits if the designated place on the aeroplane structure at which the escape route terminates is less than 1,83 metres (6 feet) from the ground with the aeroplane on the ground, the landing gear extended, and the flaps in the take off or landing position, whichever flap position is higher from the ground.
- (c) In aeroplanes required to have a separate emergency exit for the flight crew and:
1. for which the lowest point of the emergency exit is more than 1,83 metres (6 feet) above the ground with the landing gear extended; or,
  2. for which a Type Certificate was first applied for on or after 1 April 2000, would be more than 1,83 metres (6 feet) above the ground after the collapse of, or failure to extend of, one or more legs of the landing gear,
- there must be a device to assist all members of the flight crew in descending to reach the ground safely in an emergency.

## OPS 1.810

**Megaphones**

- (a) An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 60 and carrying one or more passengers unless it is equipped with portable battery-powered megaphones readily accessible for use by crew members during an emergency evacuation, to the following scales:
1. For each passenger deck:
- | Passenger seating configuration | Number of megaphones required |
|---------------------------------|-------------------------------|
| 61 to 99                        | 1                             |
| 100 or more                     | 2                             |
2. For aeroplanes with more than one passenger deck, in all cases when the total passenger seating configuration is more than 60, at least one megaphone is required.

## OPS 1.815

**Emergency lighting**

- (a) An operator shall not operate a passenger carrying aeroplane which has a maximum approved passenger seating configuration of more than nine unless it is provided with an emergency lighting system having an independent power supply to facilitate the evacuation of the aeroplane. The emergency lighting system must include:
1. For aeroplanes which have a maximum approved passenger seating configuration of more than 19:
    - (i) Sources of general cabin illumination;
    - (ii) Internal lighting in floor level emergency exit areas; and
    - (iii) Illuminated emergency exit marking and locating signs.

- (iv) For aeroplanes for which the application for the type certificate or equivalent was filed before 1 May 1972, and when flying by night, exterior emergency lighting at all over wing exits, and at exits where descent assist means are required.
  - (v) For aeroplanes for which the application for the type certificate or equivalent was filed on or after 1 May 1972, and when flying by night, exterior emergency lighting at all passenger emergency exits.
  - (vi) For aeroplanes for which the type certificate was first issued on or after 1 January 1958, floor proximity emergency escape path marking system in the passenger compartment(s).
2. For aeroplanes which have a maximum approved passenger seating configuration of 19 or less and are certificated to the Certification Specifications in CS-25 or CS-23:
- (i) Sources of general cabin illumination;
  - (ii) Internal lighting in emergency exit areas; and
  - (iii) Illuminated emergency exit marking and locating signs.
3. For aeroplanes which have a maximum approved passenger seating configuration of 19 or less and are not certificated to the Certification Specifications in CS-25 or CS-23, sources of general cabin illumination.
- (b) An operator shall not, by night, operate a passenger carrying aeroplane which has a maximum approved passenger seating configuration of nine or less unless it is provided with a source of general cabin illumination to facilitate the evacuation of the aeroplane. The system may use dome lights or other sources of illumination already fitted on the aeroplane and which are capable of remaining operative after the aeroplane's battery has been switched off.

#### OPS 1.820

##### **Emergency locator transmitter**

- (a) An operator shall not operate an aeroplane authorised to carry more than 19 passengers unless it is equipped with at least:
- 1. one automatic emergency locator transmitter (ELT) or two ELTs of any type; or
  - 2. two ELTs, one of which shall be automatic for aeroplanes first issued with an individual certificate of airworthiness after 1 July 2008.
- (b) An operator shall not operate an aeroplane authorised to carry 19 passengers or less unless it is equipped with at least:
- 1. one ELT of any type; or
  - 2. one automatic ELT for aeroplanes first issued with an individual certificate of airworthiness after 1 July 2008.
- (c) An operator shall ensure that all ELTs carried to satisfy the above requirements operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

#### OPS 1.825

##### **Life jackets**

- (a) Land aeroplanes. An operator shall not operate a land aeroplane:
- 1. when flying over water and at a distance of more than 50 nautical miles from the shore; or
  - 2. when taking off or landing at an aerodrome where 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,

unless it is equipped with life jackets equipped with a survivor locator light, for each person on board. Each life jacket must be stowed in a position easily accessible from the seat or berth of the person for whose use it is provided. Life jackets for infants may be substituted by other approved flotation devices equipped with a survivor locator light.



- (b) Seaplanes and amphibians. An operator shall not operate a seaplane or an amphibian on water unless it is equipped with life jackets equipped with a survivor locator light, for each person on board. Each life jacket must be stowed in a position easily accessible from the seat or berth of the person for whose use it is provided. Life jackets for infants may be substituted by other approved flotation devices equipped with a survivor locator light.

OPS 1.830

**Life-rafts and survival ELTs for extended overwater flights**

- (a) On overwater flights, an operator shall not operate an aeroplane at a distance away from land, which is suitable for making an emergency landing, greater than that corresponding to:
1. 120 minutes at cruising speed or 400 nautical miles, whichever is the lesser, for aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or
  2. 30 minutes at cruising speed or 100 nautical miles, whichever is the lesser, for all other aeroplanes,
- unless the equipment specified in subparagraphs (b) and (c) below is carried.
- (b) Sufficient life-rafts to carry all persons on board. Unless excess rafts of enough capacity are provided, the buoyancy and seating capacity beyond the rated capacity of the rafts must accommodate all occupants of the aeroplane in the event of a loss of one raft of the largest rated capacity. The life-rafts shall be equipped with:
1. a survivor locator light; and
  2. life saving equipment including means of sustaining life as appropriate to the flight to be undertaken; and
- (c) At least two survival emergency locator transmitters (ELT (S)) capable of transmitting on the distress frequencies prescribed in ICAO Annex 10, Volume V, Chapter 2.

OPS 1.835

**Survival equipment**

An operator shall not operate an aeroplane across areas in which search and rescue would be especially difficult unless it is equipped with the following:

- (a) signalling equipment to make the pyrotechnical distress signals described in ICAO Annex 2;
- (b) at least one ELT (S) is capable of transmitting on the distress frequencies prescribed in ICAO Annex 10, Volume V, Chapter 2; and
- (c) additional survival equipment for the route to be flown taking account of the number of persons on board

except that the equipment specified in subparagraph (c) need not be carried when the aeroplane either:

1. remains within a distance from an area where search and rescue is not especially difficult corresponding to:
  - (i) 120 minutes at the one engine inoperative cruising speed for aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or
  - (ii) 30 minutes at cruising speed for all other aeroplanes, or,
2. for aeroplanes certificated to the Certification Specifications in CS-25 or equivalent, no greater distance than that corresponding to 90 minutes at cruising speed from an area suitable for making an emergency landing.

## OPS 1.840

**Seaplanes and amphibians — Miscellaneous equipment**

- (a) An operator shall not operate a seaplane or an amphibian on water unless it is equipped with:
1. a sea anchor and other equipment necessary to facilitate mooring, anchoring or manoeuvring the aircraft on water, appropriate to its size, weight and handling characteristics; and
  2. equipment for making the sound signals prescribed in the International Regulations for preventing collisions at sea, where applicable.
-

## Appendix 1 to OPS 1.715

**Flight data recorders — 1 — List of parameters to be recorded****Table A1 — Aeroplanes with a maximum certificated take-off mass of over 5 700 kg**

Note: The numbers in the left hand column reflect the Serial Numbers depicted in EUROCAE document ED55

No	PARAMETER
1	TIME OR RELATIVE TIME COUNT
2	PRESSURE ALTITUDE
3	INDICATED AIRSPEED
4	HEADING
5	NORMAL ACCELERATION
6	PITCH ATTITUDE
7	ROLL ATTITUDE
8	MANUAL RADIO TRANSMISSION KEYING
9	PROPULSIVE THRUST/POWER ON EACH ENGINE AND COCKPIT THRUST/POWER LEVER POSITION IF APPLICABLE
10	TRAILING EDGE FLAP OR COCKPIT CONTROL SELECTION
11	LEADING EDGE FLAP OR COCKPIT CONTROL SELECTION
12	THRUST REVERSE STATUS
13	GROUND SPOILER POSITION AND/OR SPEED BRAKE SELECTION
14	TOTAL OR OUTSIDE AIR TEMPERATURE
15	AUTOPILOT, AUTOTHROTTLE AND AFCS MODE AND ENGAGEMENT STATUS
16	LONGITUDINAL ACCELERATION (BODY AXIS)
17	LATERAL ACCELERATION

**Table A2 — Aeroplanes with a maximum certificated take-off mass of 5 700 kg or below**

Note: The numbers in the left hand column reflect the Serial Numbers depicted in EUROCAE document ED55

No	PARAMETER
1	TIME OR RELATIVE TIME COUNT
2	PRESSURE ALTITUDE
3	INDICATED AIRSPEED
4	HEADING
5	NORMAL ACCELERATION
6	PITCH ATTITUDE
7	ROLL ATTITUDE
8	MANUAL RADIO TRANSMISSION KEYING
9	PROPULSIVE THRUST/POWER ON EACH ENGINE AND COCKPIT THRUST/POWER LEVER POSITION IF APPLICABLE
10	TRAILING EDGE FLAP OR COCKPIT CONTROL SELECTION
11	LEADING EDGE FLAP OR COCKPIT CONTROL SELECTION
12	THRUST REVERSE STATUS
13	GROUND SPOILER POSITION AND/OR SPEED BRAKE SELECTION
14	TOTAL OR OUTSIDE AIR TEMPERATURE.
15	AUTOPILOT/AUTOTHROTTLE ENGAGEMENT STATUS
16	ANGLE OF ATTACK (IF A SUITABLE SENSOR IS AVAILABLE)
17	LONGITUDINAL ACCELERATION (BODY AXIS)

**Table B — Additional parameters for aeroplanes with a maximum certificated take-off mass of over 27 000 kg**

Note: The numbers in the left hand column reflect the Serial Numbers depicted in EUROCAE document ED55

No	PARAMETER
18	PRIMARY FLIGHT CONTROLS — CONTROL SURFACE POSITION AND/OR PILOT INPUT (PITCH, ROLL, YAW)
19	PITCH TRIM POSITION
20	RADIO ALTITUDE
21	VERTICAL BEAM DEVIATION (ILS GLIDE PATH OR MLS ELEVATION)
22	HORIZONTAL BEAM DEVIATION (ILS LOCALISER OR MLS AZIMUTH)
23	MARKER BEACON PASSAGE
24	WARNINGS
25	RESERVED (NAVIGATION RECEIVER FREQUENCY SELECTION IS RECOMMENDED)
26	RESERVED (DME DISTANCE IS RECOMMENDED)
27	LANDING GEAR SQUAT SWITCH STATUS OR AIR/GROUND STATUS
28	GROUND PROXIMITY WARNING SYSTEM
29	ANGLE OF ATTACK
30	LOW PRESSURE WARNING (HYDRAULIC AND PNEUMATIC POWER)
31	GROUNDSPEED
32	LANDING GEAR OR GEAR SELECTOR POSITION

**Table C — Aeroplanes equipped with electronic display systems**

Note: The numbers in the centre column reflect the Serial Numbers depicted in EUROCAE document ED55 table A1.5

No	No	PARAMETER
33	6	SELECTED BAROMETRIC SETTING (EACH PILOT STATION)
34	7	SELECTED ALTITUDE
35	8	SELECTED SPEED
36	9	SELECTED MACH
37	10	SELECTED VERTICAL SPEED
38	11	SELECTED HEADING
39	12	SELECTED FLIGHT PATH
40	13	SELECTED DECISION HEIGHT
41	14	EFIS DISPLAY FORMAT
42	15	MULTI FUNCTION/ENGINE/ALERTS DISPLAY FORMAT

## Appendix 1 to OPS 1.720

**Flight data recorders — 2 — List of parameters to be recorded****Table A — Aeroplanes with a maximum certificated take-off mass of over 5 700 kg**

No	PARAMETER
1	TIME OR RELATIVE TIME COUNT
2	PRESSURE ALTITUDE
3	INDICATED AIRSPEED
4	HEADING
5	NORMAL ACCELERATION
6	PITCH ATTITUDE
7	ROLL ATTITUDE
8	MANUAL RADIO TRANSMISSION KEYING UNLESS AN ALTERNATE MEANS TO SYNCHRONISE FDR AND CVR RECORDINGS IS PROVIDED
9	POWER ON EACH ENGINE
10	TRAILING EDGE FLAP OR COCKPIT CONTROL SELECTION
11	LEADING EDGE FLAP OR COCKPIT CONTROL SELECTION
12	THRUST REVERSE POSITION (FOR TURBOJET AEROPLANES ONLY)
13	GROUND SPOILER POSITION AND/OR SPEED BRAKE SELECTION
14	OUTSIDE AIR TEMPERATURE OR TOTAL AIR TEMPERATURE
15a	AUTOPILOT ENGAGEMENT STATUS
15b	AUTOPILOT OPERATING MODES, AUTOTHROTTLE AND AFCS SYSTEMS ENGAGEMENT STATUS AND OPERATING MODES.

**Table B — Additional parameters for aeroplanes with a maximum certificated take-off mass over 27 000 kg**

No	PARAMETER
16	LONGITUDINAL ACCELERATION
17	LATERAL ACCELERATION
18	PRIMARY FLIGHT CONTROLS — CONTROL SURFACE POSITION AND/OR PILOT INPUT (PITCH, ROLL AND YAW)
19	PITCH TRIM POSITION
20	RADIO ALTITUDE
21	GLIDE PATH DEVIATION
22	LOCALISER DEVIATION
23	MARKER BEACON PASSAGE
24	MASTER WARNING
25	NAV 1 AND NAV 2 FREQUENCY SELECTION
26	DME 1 AND DME 2 DISTANCE
27	LANDING GEAR SQUAT SWITCH STATUS
28	GROUND PROXIMITY WARNING SYSTEM
29	ANGLE OF ATTACK
30	HYDRAULICS, EACH SYSTEM (LOW PRESSURE)
31	NAVIGATION DATA
32	LANDING GEAR OR GEAR SELECTOR POSITION

## Appendix 1 to OPS 1.725

**Flight data recorders — 3 — List of parameters to be recorded****Table A — Aeroplanes with a maximum certificated take-off mass of over 5 700 kg**

No	PARAMETER
1	TIME OR RELATIVE TIME COUNT
2	PRESSURE ALTITUDE
3	INDICATED AIRSPEED
4	HEADING
5	NORMAL ACCELERATION

**Table B — Additional parameters for aeroplanes with a maximum certificated take-off mass of over 27 000 kg**

No	PARAMETER
6	PITCH ATTITUDE
7	ROLL ATTITUDE
8	MANUAL RADIO TRANSMISSION KEYING UNLESS AN ALTERNATE MEANS TO SYNCHRONISE THE FDR AND CVR RECORDINGS IS PROVIDED
9	POWER ON EACH ENGINE
10	TRAILING EDGE FLAP OR COCKPIT CONTROL SELECTION
11	LEADING EDGE FLAP OR COCKPIT CONTROL SELECTION
12	THRUST REVERSE POSITION (FOR TURBOJET AEROPLANES ONLY)
13	GROUND SPOILER POSITION AND/OR SPEED BRAKE SELECTION
14	OUTSIDE AIR TEMPERATURE OR TOTAL AIR TEMPERATURE
15a	AUTOPILOT ENGAGEMENT STATUS
15b	AUTOPILOT OPERATING MODES, AUTOTHROTTLE AND AFCS, SYSTEMS ENGAGEMENT STATUS AND OPERATING MODES.
16	LONGITUDINAL ACCELERATION
17	LATERAL ACCELERATION
18	PRIMARY FLIGHT CONTROLS — CONTROL SURFACE POSITION AND/OR PILOT INPUT (PITCH, ROLL AND YAW)
19	PITCH TRIM POSITION
20	RADIO ALTITUDE
21	GLIDE PATH DEVIATION
22	LOCALISER DEVIATION
23	MARKER BEACON PASSAGE
24	MASTER WARNING
25	NAV 1 AND NAV 2 FREQUENCY SELECTION
26	DME 1 AND DME 2 DISTANCE
27	LANDING GEAR SQUAT SWITCH STATUS
28	GROUND PROXIMITY WARNING SYSTEM
29	ANGLE OF ATTACK
30	HYDRAULICS, EACH SYSTEM (LOW PRESSURE)
31	NAVIGATION DATA (LATITUDE, LONGITUDE, GROUND SPEED AND DRIFT ANGLE)
32	LANDING GEAR OR GEAR SELECTOR POSITION

## Appendix 1 to OPS 1.770

**Oxygen — Minimum requirements for supplemental oxygen for pressurised aeroplanes during and following emergency descent**

Table 1

(a)	(b)
SUPPLY FOR:	DURATION AND CABIN PRESSURE ALTITUDE
1. All occupants of flight deck seats on flight deck duty	Entire flight time when the cabin pressure altitude exceeds 13 000 ft and entire flight time when the cabin pressure altitude exceeds 10 000 ft but does not exceed 13 000 ft after the first 30 minutes at those altitudes, but in no case less than:  (i) 30 minutes for aeroplanes certificated to fly at altitudes not exceeding 25 000 ft ( <i>Note 2</i> )  (ii) two hours for aeroplanes certificated to fly at altitudes more than 25 000 ft ( <i>Note 3</i> ).
2. All required cabin crew members	Entire flight time when cabin pressure altitude exceeds 13 000 ft but not less than 30 minutes ( <i>Note 2</i> ), and entire flight time when cabin pressure altitude is greater than 10 000 ft but does not exceed 13 000 ft after the first 30 minutes at these altitudes
3. 100 % of passengers ( <i>Note 5</i> )	Entire flight time when the cabin pressure altitude exceeds 15 000 ft but in no case less than 10 minutes ( <i>Note 4</i> ).
4. 30 % of passengers ( <i>Note 5</i> )	Entire flight time when the cabin pressure altitude exceeds 14 000 ft but does not exceed 15 000 ft
5. 10 % of passengers ( <i>Note 5</i> ).	Entire flight time when the cabin pressure altitude exceeds 10 000 ft but does not exceed 14 000 ft after the first 30 minutes at these altitudes

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

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

*Note 3:* The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10 000 ft in 10 minutes and followed by 110 minutes at 10 000 ft. The oxygen required in OPS 1.780 (a)1 may be included in determining the supply required.

*Note 4:* The required minimum supply is that quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 15 000 ft in 10 minutes.

*Note 5:* For the purpose of this table "passengers" means passengers actually carried and includes infants.

## Appendix 1 to OPS 1.775

**Supplemental oxygen for non-pressurised aeroplanes**

Table 1

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

*Note:* For the purpose of this table "passengers" means passengers actually carried and includes infants under the age of 2.



## SUBPART L

## COMMUNICATION AND NAVIGATION EQUIPMENT

## OPS 1.845

**General introduction**

- (a) An operator shall ensure that a flight does not commence unless the communication and navigation equipment required under this Subpart is:
1. Approved and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and airworthiness requirements;
  2. Installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the failure of another unit required for communications or navigation purposes;
  3. In operable condition for the kind of operation being conducted except as provided in the MEL (OPS 1.030 refers); and
  4. So arranged that if equipment is to be used by one flight crew member at his/her station during flight it must be readily operable from his/her station. When a single item of equipment is required to be operated by more than one flight crew member it must be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.
- (b) Communication and navigation equipment minimum performance standards are those prescribed in the applicable European Technical Standard Orders (ETSO) as listed in applicable specifications on European Technical Standard Orders (CS-TSO), unless different performance standards are prescribed in the operational or airworthiness codes. Communication and navigation equipment complying with design and performance specifications other than ETSO on the date of OPS implementation may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Communication and navigation equipment which has already been approved does not need to comply with a revised ETSO or a revised specification, other than ETSO, unless a retroactive requirement is prescribed.

## OPS 1.850

**Radio equipment**

- (a) An operator shall not operate an aeroplane unless it is equipped with radio required for the kind of operation being conducted.
- (b) Where two independent (separate and complete) radio systems are required under this Subpart, each system must have an independent antenna installation except that, where rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used, only one antenna is required.
- (c) The radio communication equipment required to comply with paragraph (a) above must also provide for communications on the aeronautical emergency frequency 121,5 MHz.

## OPS 1.855

**Audio selector panel**

An operator shall not operate an aeroplane under IFR unless it is equipped with an audio selector panel accessible to each required flight crew member.

## OPS 1.860

**Radio equipment for operations under VFR over routes navigated by reference to visual landmarks**

An operator shall not operate an aeroplane under VFR over routes that can be navigated by reference to visual landmarks, unless it is equipped with the radio communication equipment necessary under normal operating conditions to fulfil the following:

- (a) Communicate with appropriate ground stations;
- (b) Communicate with appropriate air traffic control facilities from any point in controlled airspace within which flights are intended; and
- (c) Receive meteorological information.

## OPS 1.865

**Communication and navigation equipment for operations under IFR, or under VFR over routes not navigated by reference to visual landmarks**

- (a) An operator shall not operate an aeroplane under IFR, or under VFR over routes that cannot be navigated by reference to visual landmarks, unless the aeroplane is equipped with radio communication and SSR transponder and navigation equipment in accordance with the requirements of air traffic services in the area(s) of operation.
- (b) Radio equipment. An operator shall ensure that radio equipment comprises not less than:
  - 1. two independent radio communication systems necessary under normal operating conditions to communicate with an appropriate ground station from any point on the route including diversions; and
  - 2. SSR transponder equipment as required for the route being flown.
- (c) for short-haul operations in the NAT MNPS airspace not crossing the North Atlantic, an aeroplane may be equipped with one long range communication system (HF-system) only if alternative communication procedures are published for the airspace concerned.
- (d) Navigation equipment. An operator shall ensure that navigation equipment
  - 1. Comprises not less than:
    - (i) one VOR receiving system, one ADF system, one DME except that an ADF system need not be installed provided that the use of the ADF is not required in any phase of the planned flight;
    - (ii) one ILS or MLS where ILS or MLS is required for approach navigation purposes;
    - (iii) one marker beacon receiving system where a marker beacon is required for approach navigation purposes;
    - (iv) an area navigation system when area navigation is required for the route being flown;
    - (v) an additional DME system on any route, or part thereof, where navigation is based only on DME signals;
    - (vi) an additional VOR receiving system on any route, or part thereof, where navigation is based only on VOR signals;
    - (vii) an additional ADF system on any route, or part thereof, where navigation is based only on NDB signals; or
  - 2. complies with the required navigation performance (RNP) type for operation in the airspace concerned.

- (e) An operator may operate an aeroplane that is not equipped with an ADF or with the navigation equipment specified in subparagraph(s) (c)1(vi) and/or (c)1(vii) above, provided that it is equipped with alternative equipment authorised, for the route being flown, by the Authority. The reliability and the accuracy of alternative equipment must allow safe navigation for the intended route.
- (f) An operator shall ensure that VHF communication equipment, ILS Localiser and VOR receivers installed on aeroplanes to be operated in IFR are of a type that has been approved as complying with the FM immunity performance standards.
- (g) An operator shall ensure that aeroplanes conducting ETOPS have a communication means capable of communicating with an appropriate ground station at normal and planned contingency altitudes. For ETOPS routes where voice communication facilities are available, voice communications shall be provided. For all ETOPS operations beyond 180 minutes, reliable communication technology, either voice based or data link, must be installed. Where voice communication facilities are not available and where voice communication is not possible or is of poor quality, communications using alternative systems must be ensured.

OPS 1.866

**Transponder equipment**

- (a) An operator shall not operate an aeroplane unless it is equipped with:
  - 1. a pressure altitude reporting SSR transponder; and
  - 2. any other SSR transponder capability required for the route being flown.

OPS 1.870

**Additional navigation equipment for operations in MNPS airspace**

- (a) An operator shall not operate an aeroplane in MNPS airspace unless it is equipped with navigation equipment that complies with minimum navigation performance specifications prescribed in ICAO Doc 7030 in the form of regional supplementary procedures.
- (b) The navigation equipment required by this paragraph must be visible and usable by either pilot seated at his/her duty station.
- (c) For unrestricted operation in MNPS airspace an aeroplane must be equipped with two independent long range navigation systems (LRNS).
- (d) For operation in MNPS airspace along notified special routes an aeroplane must be equipped with one long range navigation system (LRNS), unless otherwise specified.

OPS 1.872

**Equipment for operation in defined airspace with reduced vertical separation minima (RVSM)**

- (a) An operator shall ensure that aeroplanes operated in RVSM airspace are equipped with:
  - 1. two independent altitude measurement systems;
  - 2. an altitude alerting system;
  - 3. an automatic altitude control system; and
  - 4. a secondary surveillance radar (SSR) transponder with altitude reporting system that can be connected to the altitude measurement system in use for altitude keeping.

## OPS 1.873

**Electronic navigation data management**

- (a) An operator shall not use a navigation database which supports an airborne navigation application as a primary means of navigation unless the navigation database supplier holds a Type 2 Letter of Acceptance (LoA) or equivalent.
- (b) If the operator's supplier does not hold a Type 2 LoA or equivalent, the operator shall not use the electronic navigation data products unless the Authority has approved the operator's procedures for ensuring that the process applied and the delivered products have met equivalent standards of integrity.
- (c) An operator shall not use electronic navigation data products for other navigation applications unless the Authority has approved the operator's procedures for ensuring that the process applied and the delivered products have met standards of integrity acceptable for the intended use of the data.
- (d) An operator shall continue to monitor both the process and the products according to the requirements of OPS 1.035.
- (e) An operator shall implement procedures that ensure timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.

## SUBPART M

## AEROPLANE MAINTENANCE

## OPS 1.875

**General**

- (a) An operator shall not operate an aeroplane unless it is maintained and released to service by an organisation appropriately approved/accepted in accordance with Part 145 except that pre-flight inspections need not necessarily be carried out by the Part 145 organisation.
- (b) Aeroplane continuing airworthiness requirements needed to comply with the operator certification requirements in OPS 1.180 are those set up in Part M.

## SUBPART N

## FLIGHT CREW

## OPS 1.940

**Composition of flight crew**

(See Appendices 1 and 2 to OPS 1.940)

- (a) An operator shall ensure that:
1. the composition of the flight crew and the number of flight crew members at designated crew stations are both in compliance with, and no less than the minimum specified in, the Aeroplane Flight Manual (AFM);
  2. the flight crew includes additional flight crew members when required by the type of operation, and is not reduced below the number specified in the Operations Manual;
  3. all flight crew members hold an applicable and valid licence acceptable to the Authority and are suitably qualified and competent to conduct the duties assigned to them;
  4. procedures are established, acceptable to the Authority, to prevent the crewing together of inexperienced flight crew members;
  5. one pilot amongst the flight crew, qualified as a pilot-in-command in accordance with the requirements governing Flight Crew Licenses, is designated as the commander who may delegate the conduct of the flight to another suitably qualified pilot; and
  6. when a dedicated System Panel Operator is required by the AFM, the flight crew includes one crew member who holds a Flight Engineer's licence or is a suitably qualified flight crew member and acceptable to the Authority.
  7. when engaging the services of flight crew members who are self employed and/or working on a freelance or part time basis, the requirements of Subpart N are complied with. In this respect, particular attention must be paid to the total number of aircraft types or variants that a flight crew member may fly for the purposes of commercial air transportation, which must not exceed the requirements prescribed in OPS 1.980 and OPS 1.981, including when his/her services are engaged by another operator. For crew members serving the operator as a commander, initial operator's crew resource management (CRM) training shall be completed before commencing unsupervised line flying unless the crew member has previously completed an initial operator's CRM course.
- (b) Minimum flight crew for operations under IFR or at night. For operations under IFR or at night, an operator shall ensure that:
1. for all turbo-propeller aeroplanes with a maximum approved passenger seating configuration of more than nine and for all turbo-jet aeroplanes, the minimum flight crew is two pilots; or
  2. aeroplanes other than those covered by subparagraph (b)1 above are operated by a single pilot provided that the requirements of Appendix 2 to OPS 1.940 are satisfied. If the requirements of Appendix 2 are not satisfied, the minimum flight crew is two pilots.

## OPS 1.943

**Initial operator's crew resource management (CRM) training**

- (a) When a flight crew member has not previously completed initial operator's crew resource management (CRM) training (either new employees or existing staff), then the operator shall ensure that the flight crew member completes an initial CRM training course. New employees shall complete initial operator's CRM Training within their first year of joining an operator.

- (b) If the flight crew member has not previously been trained in human factors then a theoretical course, based on the human performance and limitations programme for the ATPL (see the requirements applicable to the issue of Flight Crew Licences) shall be completed before the initial operator's CRM training or combined with the initial operator's CRM training.
- (c) Initial CRM training shall be conducted by at least one CRM trainer acceptable to the Authority who may be assisted by experts in order to address specific areas.
- (d) Initial CRM training is conducted in accordance with a detailed course syllabus included in the Operations Manual.

OPS 1.945

**Conversion training and checking**

(See Appendix 1 to OPS 1.945)

- (a) An operator shall ensure that:
  - 1. a flight crew member completes a Type Rating course which satisfies the requirements applicable to the issue of Flight Crew Licences when changing from one type of aeroplane to another type or class for which a new type or class rating is required;
  - 2. a flight crew member completes an operator's conversion course before commencing unsupervised line flying;
    - (i) when changing to an aeroplane for which a new type or class rating is required; or
    - (ii) when changing operator;
  - 3. conversion training is conducted by suitably qualified personnel in accordance with a detailed course syllabus included in the Operations Manual. The operator shall ensure that the personnel integrating elements of CRM into conversion training are suitably qualified;
  - 4. the amount of training required by the operator's conversion course is determined after due note has been taken of the flight crew member's previous training as recorded in his/her training records prescribed in OPS 1.985;
  - 5. the minimum standards of qualification and experience required of flight crew members before undertaking conversion training are specified in the Operations Manual;
  - 6. each flight crew member undergoes the checks required by OPS 1.965(b) and the training and checks required by OPS 1.965(d) before commencing line flying under supervision;
  - 7. upon completion of line flying under supervision, the check required by OPS 1.965(c) is undertaken;
  - 8. once an operator's conversion course has been commenced, a flight crew member does not undertake flying duties on another type or class until the course is completed or terminated; and
  - 9. elements of CRM training are integrated into the conversion course.
- (b) In the case of changing aeroplane type or class, the check required by OPS 1.965(b) may be combined with the type or class rating skill test under the requirements applicable to the issue of Flight Crew Licences.
- (c) The operator's conversion course and the type or class rating course required for the issue of Flight Crew Licences may be combined.
- (d) A pilot, undertaking a zero flight time training (ZFTT) course, shall:
  - 1. commence line flying under supervision as soon as possible within 21 days after completion of the skill test.

If line flying under supervision has not been commenced within the 21 days, the operator shall provide appropriate training acceptable to the Authority.

2. complete six take-offs and landings in a flight simulator, qualified in accordance with the requirements applicable to synthetic training devices and user approved by the Authority, not later than 21 days after the completion of the skill test.

This simulator session shall be conducted by a type rating instructor for aeroplanes (TRI(A)) occupying a pilot's seat.

When recommended by a JOINT OPERATIONAL EVALUATION Board (JOEB) and approved by the Authority, the number of take-offs and landings may be reduced.

If these take-offs and landings have not been performed within the 21 days, the operator shall provide refresher training acceptable to the Authority;

3. conduct the first four take-offs and landings of the Line Flying Under Supervision in the aeroplane under the supervision of a TRI(A) occupying a pilot's seat.

When recommended by a joint operational evaluation board (JOEB) and approved by the Authority, the number of take-offs and landings may be reduced.

#### OPS 1.950

##### **Differences training and familiarisation training**

- (a) An operator shall ensure that a flight crew member completes:
  1. differences training which requires additional knowledge and training on an appropriate training device for the aeroplane:
    - (i) when operating another variant of an aeroplane of the same type or another type of the same class currently operated; or
    - (ii) when changing equipment and/or procedures on types or variants currently operated;
  2. familiarisation training which requires the acquisition of additional knowledge:
    - (i) when operating another aeroplane of the same type or variant; or
    - (ii) when changing equipment and/or procedures on types or variants currently operated.
- (b) The operator shall specify in the Operations Manual when such differences training or familiarisation training is required.

#### OPS 1.955

##### **Nomination as commander**

- (a) An operator shall ensure that for upgrade to commander from co-pilot and for those joining as commanders:
  1. A minimum level of experience, acceptable to the Authority, is specified in the Operations Manual; and
  2. For multi-crew operations, the pilot completes an appropriate command course.
- (b) The command course required by subparagraph (a)2 above must be specified in the Operations Manual and include at least the following:
  1. training in an STD (including line orientated flying training) and/or flying training;
  2. an operator proficiency check operating as commander;



3. commander's responsibilities;
4. line training in command under supervision. A minimum of 10 sectors is required for pilots already qualified on the aeroplane type;
5. completion of a commander's line check as prescribed in OPS 1.965(c) and route and aerodrome competence qualifications as prescribed in OPS 1.975; and
6. elements of Crew Resource Management.

OPS 1.960

**Commanders holding a Commercial Pilot Licence**

- (a) An operator shall ensure that:
1. A Commercial Pilot Licence (CPL) holder does not operate as a commander of an aeroplane certificated in the Aeroplane Flight Manual for single pilot operations unless:
    - (i) when conducting passenger carrying operations under Visual Flight Rules (VFR) outside a radius of 50 nm from an aerodrome of departure, the pilot has a minimum of 500 hours total flight time on aeroplanes or holds a valid Instrument Rating; or
    - (ii) when operating on a multi-engine type under Instrument Flight Rules (IFR), the pilot has a minimum of 700 hours total flight time on aeroplanes which includes 400 hours as pilot-in-command (in accordance with the requirements governing Flight Crew Licenses) of which 100 hours have been under IFR including 40 hours multi-engine operation. The 400 hours as pilot-in-command may be substituted by hours operating as co-pilot on the basis of two hours co-pilot is equivalent to one hour as pilot-in-command provided those hours were gained within an established multi-pilot crew system prescribed in the Operations Manual;
  2. in addition to subparagraph (a)1(ii) above, when operating under IFR as a single pilot, the requirements prescribed in Appendix 2 to OPS 1.940 are satisfied; and
  3. in multi-pilot crew operations, in addition to subparagraph (a)1 above, and prior to the pilot operating as commander, the command course prescribed in OPS 1.955(a)2 is completed.

OPS 1.965

**Recurrent Training and Checking**

(See Appendices 1 and 2 to OPS 1.965)

- (a) General. An operator shall ensure that:
1. each flight crew member undergoes recurrent training and checking and that all such training and checking is relevant to the type or variant of aeroplane on which the flight crew member operates;
  2. a recurrent training and checking programme is established in the Operations Manual and approved by the Authority;
  3. recurrent training is conducted by the following personnel:
    - (i) ground and refresher training — by suitably qualified personnel;
    - (ii) aeroplane/STD training — by a type rating instructor (TRI), class rating instructor (CRI) or in the case of the STD content, a synthetic flight instructor (SFI), providing that the TRI, CRI or SFI satisfies the operator's experience and knowledge requirements sufficient to instruct on the items specified in paragraphs (a)1.(i)(A) and (B) of Appendix 1 to OPS 1.965;
    - (iii) emergency and safety equipment training — by suitably qualified personnel; and

- (iv) crew resource management (CRM):
  - (A) integration of CRM elements into all the phases of the recurrent training — by all the personnel conducting recurrent training. The operator shall ensure that all personnel conducting recurrent training are suitably qualified to integrate elements of CRM into this training;
  - (B) modular CRM training — by at least one CRM trainer acceptable to the Authority who may be assisted by experts in order to address specific areas;
- 4. recurrent checking is conducted by the following personnel:
  - (i) operator proficiency checks — by a type rating examiner (TRE), class rating examiner (CRE) or, if the check is conducted in a STD, a TRE, CRE or a synthetic flight examiner (SFE), trained in CRM concepts and the assessment of CRM skills;
  - (ii) line checks — by suitably qualified commanders nominated by the operator and acceptable to the Authority;
  - (iii) emergency and safety equipment checking — by suitably qualified personnel.
- (b) Operator proficiency check
  - 1. An operator shall ensure that:
    - (i) each flight crew member undergoes operator proficiency checks to demonstrate his/her competence in carrying out normal, abnormal and emergency procedures; and
    - (ii) the check is conducted without external visual reference when the flight crew member will be required to operate under IFR;
    - (iii) each flight crew member undergoes operator proficiency checks as part of a normal flight crew complement.
  - 2. The period of validity of an operator proficiency check shall be six calendar months in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous operator proficiency check, the period of validity shall extend from the date of issue until six calendar months from the expiry date of that previous operator proficiency check.
- (c) Line Check. An operator shall ensure that each flight crew member undergoes a line check on the aeroplane to demonstrate his/her competence in carrying out normal line operations described in the Operations Manual. The period of validity of a line check shall be 12 calendar months, in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous line check the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous line check.
- (d) Emergency and Safety Equipment training and checking. An operator shall ensure that each flight crew member undergoes training and checking on the location and use of all emergency and safety equipment carried. The period of validity of an emergency and safety equipment check shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous emergency and safety check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous emergency and safety equipment check.
- (e) CRM. An operator shall ensure that:
  - 1. elements of CRM are integrated into all appropriate phases of the recurrent training, and;
  - 2. each flight crew member undergoes specific modular CRM training. All major topics of CRM training shall be covered over a period not exceeding three years;
- (f) Ground and refresher training. An operator shall ensure that each flight crew member undergoes ground and refresher training at least every 12 calendar months. If the training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next ground and refresher training must be completed within 12 calendar months of the original expiry date of the previous ground and refresher training.

- (g) Aeroplane/STD training. An operator shall ensure that each flight crew member undergoes aeroplane/STD training at least every 12 calendar months. If the training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next aeroplane STD training must be completed within 12 calendar months of the original expiry date of the previous aeroplane/STD training.

*OPS 1.968*

**Pilot qualification to operate in either pilot's seat**

(See Appendix 1 to OPS 1.968)

- (a) An operator shall ensure that:
1. a pilot who may be assigned to operate in either pilot's seat completes appropriate training and checking; and
  2. the training and checking programme is specified in the Operations Manual and is acceptable to the Authority.

*OPS 1.970*

**Recent experience**

- (a) An operator shall ensure that:
1. a pilot is not assigned to operate an aeroplane as part of the minimum certificated crew, either as pilot flying or pilot non-flying unless he/she has carried out three take-offs and three landings in the previous 90 days as pilot flying in an aeroplane, or in a flight simulator of the same type/class.
  2. a pilot who does not hold a valid instrument rating is not assigned to operate an aeroplane at night as commander unless he/she has carried out at least one landing at night in the preceding 90 days as pilot flying in an aeroplane, or in a flight simulator, of the same type/class.
- (b) The 90-day period prescribed in subparagraphs (a)1 and 2 above may be extended up to a maximum of 120 days by line flying under the supervision of a type rating instructor or examiner. For periods beyond 120 days, the recency requirement is satisfied by a training flight or use of a flight simulator of the aeroplane type to be used.

*OPS 1.975*

**Route and aerodrome competence qualification**

- (a) An operator shall ensure that, prior to being assigned as commander or as pilot to whom the conduct of the flight may be delegated by the commander, the pilot has obtained adequate knowledge of the route to be flown and of the aerodromes (including alternates), facilities and procedures to be used.
- (b) The period of validity of the route and aerodrome competence qualification shall be 12 calendar months in addition to the remainder of:
1. the month of qualification; or
  2. the month of the latest operation on the route or to the aerodrome.
- (c) Route and aerodrome competence qualification shall be revalidated by operating on the route or to the aerodrome within the period of validity prescribed in subparagraph (b) above.
- (d) If revalidated within the final three calendar months of the validity of the previous route and aerodrome competence qualification, the period of validity shall extend from the date of revalidation until 12 calendar months from the expiry date of that previous route and aerodrome competence qualification.

## OPS 1.978

**Alternative training and qualification programme**

(See Appendix 1 to OPS 1.978)

- (a) An operator, following a minimum of two years continuous operations, may substitute the training and checking requirements for flight crew specified in Appendix 1 to OPS 1.978(a) by an alternative training and Qualification programme (ATQP) approved by the Authority. The two years continuous operations may be reduced at the discretion of the Authority.
- (b) The ATQP must contain training and checking which establishes and maintains a level of proficiency demonstrated to be at least not less than the level of proficiency achieved by following the provisions of OPS 1.945, 1.965 and 1.970. The standard of flight crew training and qualification shall be established prior to the introduction of ATQP; the required ATQP training and qualification standards shall also be specified.
- (c) An operator applying for approval to implement an ATQP shall provide the Authority with an implementation plan in accordance with paragraph (c) of Appendix 1 to OPS 1.978.
- (d) In addition to the checks required by OPS 1.965 and 1.970 an operator shall ensure that each flight crew member undergoes a Line Orientated Evaluation (LOE).
  - 1. The line orientated evaluation (LOE) shall be conducted in a simulator. The LOE may be undertaken with other approved ATQP training.
  - 2. The period of validity of a LOE shall be 12 calendar months, in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous LOE the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous LOE.
- (e) After two years of operating within an approved ATQP an operator may, with the approval of the Authority, extend the periods of validity of OPS 1.965 and 1.970 as follows:
  - 1. operator proficiency check — 12 calendar months in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous operator proficiency check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous operator proficiency check;
  - 2. line check — 24 calendar months in addition to the remainder of the month of issue. If issued within the final six calendar months of validity of a previous line check, the period of validity shall extend from the date of issue until 24 calendar months from the expiry date of that previous line check. The line check may be combined with a line oriented quality evaluation (LOQE) with the approval of the authority;
  - 3. emergency and safety equipment checking — 24 calendar months in addition to the remainder of the month of issue. If issued within the final 6 calendar months of validity of a previous check, the period of validity shall extend from the date of issue until 24 calendar months from the expiry date of that previous check.
- (f) The ATQP shall be the responsibility of a nominated post holder.

## OPS 1.980

**Operation on more than one type or variant**

(See Appendix 1 to OPS 1.980)

- (a) An operator shall ensure that a flight crew member does not operate on more than one type or variant unless the flight crew member is competent to do so.
- (b) When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account of the following:
  - 1. the level of technology;
  - 2. operational procedures;
  - 3. handling characteristics.

- (c) An operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements prescribed in Subpart N for each type or variant unless the Authority has approved the use of credit(s) related to the training, checking and recent experience requirements.
- (d) An operator shall specify appropriate procedures and/or operational restrictions, approved by the Authority, in the Operations Manual, for any operation on more than one type or variant covering:
  - 1. the flight crew members' minimum experience level;
  - 2. the minimum experience level on one type or variant before beginning training for and operation of another type or variant;
  - 3. the process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant;
  - 4. all applicable recent experience requirements for each type or variant.

OPS 1.981

**Operation of helicopter and aeroplane**

- (a) When a flight crew member operates both helicopters and aeroplanes:
  - 1. an operator shall ensure that operations of helicopter and aeroplane are limited to one type of each;
  - 2. the operator shall specify appropriate procedures and/or operational restrictions, approved by the Authority, in the Operations Manual.

OPS 1.985

**Training records**

- (a) An operator shall:
    - 1. maintain records of all training, checking and qualification prescribed in OPS 1.945, 1.955, 1.965, 1.968 and 1.975 undertaken by a flight crew member; and
    - 2. make the records of all conversion courses and recurrent training and checking available, on request, to the flight crew member concerned.
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*Appendix 1 to OPS 1.940***In-flight relief of flight crew members**

- (a) A flight crew member may be relieved in flight of his/her duties at the controls by another suitably qualified flight crew member.
  - (b) Relief of the commander
    - 1. The commander may delegate conduct of the flight to:
      - (i) another qualified commander; or
      - (ii) for operations only above FL 200, a pilot qualified as detailed in subparagraph (c) below.
  - (c) Minimum requirements for a pilot relieving the commander:
    - 1. valid Airline Transport Pilot Licence;
    - 2. conversion training and checking (including type rating training) as prescribed in OPS 1.945;
    - 3. all recurrent training and checking as prescribed in OPS 1.965 and OPS 1.968; and
    - 4. route competence qualification as prescribed in OPS 1.975.
  - (d) Relief of the co-pilot
    - 1. The co-pilot may be relieved by:
      - (i) another suitably qualified pilot; or
      - (ii) a cruise relief co-pilot qualified as detailed in subparagraph (e) below.
  - (e) Minimum requirements for cruise relief co-pilot:
    - 1. valid Commercial Pilot Licence with instrument rating;
    - 2. conversion training and checking, including type rating training, as prescribed in OPS 1.945 except the requirement for take-off and landing training;
    - 3. all recurrent training and checking as prescribed in OPS 1.965 except the requirement for take-off and landing training; and
    - 4. to operate in the role of co-pilot in the cruise only and not below FL 200.
    - 5. recent experience as prescribed in OPS 1.970 is not required. The pilot shall, however, carry out flight simulator recency and refresher flying skill training at intervals not exceeding 90 days. This refresher training may be combined with the training prescribed in OPS 1.965.
  - (f) Relief of the system panel operator. A system panel operator may be relieved in flight by a crew member who holds a flight engineer's licence or by a flight crew member with a qualification acceptable to the Authority.
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*Appendix 2 to OPS 1.940***Single pilot operations under IFR or at night**

- (a) Aeroplanes referred to in OPS 1.940(b)2 may be operated by a single pilot under IFR or at night when the following requirements are satisfied:
1. the operator shall include in the Operations Manual a pilot's conversion and recurrent training programme which includes the additional requirements for a single pilot operation;
  2. in particular, the cockpit procedures must include:
    - (i) engine management and emergency handling;
    - (ii) use of normal, abnormal and emergency checklist;
    - (iii) ATC communication;
    - (iv) departure and approach procedures;
    - (v) autopilot management; and
    - (vi) use of simplified in-flight documentation;
  3. the recurrent checks required by OPS 1.965 shall be performed in the single-pilot role on the type or class of aeroplane in an environment representative of the operation;
  4. the pilot shall have a minimum of 50 hours flight time on the specific type or class of aeroplane under IFR of which 10 hours is as commander; and
  5. the minimum required recent experience for a pilot engaged in a single-pilot operation under IFR or at night shall be 5 IFR flights, including three instrument approaches, carried out during the preceding 90 days on the type or class of aeroplane in the single-pilot role. This requirement may be replaced by an IFR instrument approach check on the type or class of aeroplane.
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*Appendix 1 to OPS 1.945***Operator's conversion course**

- (a) An operator's conversion course shall include:
    - 1. ground training and checking including aeroplane systems, normal, abnormal and emergency procedures;
    - 2. emergency and safety equipment training and checking which must be completed before aeroplane training commences;
    - 3. aeroplane/flight simulator training and checking; and
    - 4. line flying under supervision and line check.
  - (b) The conversion course shall be conducted in the order set out in subparagraph (a) above.
  - (c) Elements of crew resource management shall be integrated into the conversion course, and conducted by suitably qualified personnel.
  - (d) When a flight crew member has not previously completed an operator's conversion course, the operator shall ensure that in addition to subparagraph (a) above, the flight crew member undergoes general first aid training and, if applicable, ditching procedures training using the equipment in water.
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*Appendix 1 to OPS 1.965***Recurrent training and checking — Pilots**

- (a) Recurrent training. Recurrent training shall comprise:
1. Ground and refresher training;
    - (i) the ground and refresher training programme shall include:
      - (A) aeroplane systems;
      - (B) operational procedures and requirements including ground de-/anti-icing and pilot incapacitation; and
      - (C) accident/incident and occurrence review.
    - (ii) Knowledge of the ground and refresher training shall be verified by a questionnaire or other suitable methods.
  2. Aeroplane/STD training;
    - (i) The aeroplane/STD training programme shall be established such that all major failures of aeroplane systems and associated procedures will have been covered in the preceding three-year period.
    - (ii) When engine-out manoeuvres are carried out in an aeroplane, the engine failure shall be simulated.
    - (iii) Aeroplane/STD training may be combined with the operator proficiency check.
  3. Emergency and safety equipment training;
    - (i) The emergency and safety equipment training programme may be combined with emergency and safety equipment checking and shall be conducted in an aeroplane or a suitable alternative training device.
    - (ii) Every year the emergency and safety equipment training programme must include the following:
      - (A) actual donning of a lifejacket where fitted;
      - (B) actual donning of protective breathing equipment where fitted;
      - (C) actual handling of fire extinguishers;
      - (D) instruction on the location and use of all emergency and safety equipment carried on the aeroplane;
      - (E) instruction on the location and use of all types of exits; and
      - (F) security procedures.
    - (iii) Every three years the programme of training must include the following:
      - (A) actual operation of all types of exits;
      - (B) demonstration of the method used to operate a slide where fitted;
      - (C) actual fire-fighting using equipment representative of that carried in the aeroplane on an actual or simulated fire except that, with Halon extinguishers, an alternative method acceptable to the Authority may be used;
      - (D) the effects of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment;
      - (E) actual handling of pyrotechnics, real or simulated, where fitted; and
      - (F) demonstration in the use of the life-raft(s) where fitted.

4. Crew resource management training

- (i) Elements of CRM shall be integrated into all appropriate phases of recurrent training; and
- (ii) A specific modular CRM training programme shall be established such that all major topics of CRM training are covered over a period not exceeding three years, as follows:
  - (A) human error and reliability, error chain, error prevention and detection;
  - (B) company safety culture, SOPs, organisational factors;
  - (C) stress, stress management, fatigue and vigilance;
  - (D) information acquisition and processing, situation awareness, workload management;
  - (E) decision making;
  - (F) communication and coordination inside and outside the cockpit;
  - (G) leadership and team behaviour, synergy;
  - (H) automation and philosophy of the use of automation (if relevant to the type);
  - (I) specific type-related differences;
  - (J) case based studies;
  - (K) additional areas which warrant extra attention, as identified by the accident prevention and flight safety programme (see OPS 1.037).
- (iii) Operators shall establish procedures to update their CRM recurrent training programme. Revision of the Programme shall be conducted over a period not exceeding three years. The revision of the programme shall take into account the de-identified results of the CRM assessments of crews, and information identified by the accident prevention and flight safety programme.

(b) Recurrent checking. Recurrent checking shall comprise:

1. Operator proficiency checks;

- (i) Where applicable, operator proficiency checks shall include the following manoeuvres:
  - (A) rejected take-off when a flight simulator is available, otherwise touch drills only;
  - (B) take-off with engine failure between V1 and V2 or as soon as safety considerations permit;
  - (C) precision instrument approach to minima with, in the case of multi-engined aeroplanes, one engine inoperative;
  - (D) non-precision approach to minima;
  - (E) missed approach on instruments from minima with, in the case of multi-engined aeroplanes, one engine inoperative; and
  - (F) landing with one engine inoperative. For single-engined aeroplanes a practice forced landing is required.
- (ii) When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.
- (iii) In addition to the checks prescribed in subparagraphs (i)(A) to (F) above, the requirements governing the issue of flight crew licences must be completed every 12 months and may be combined with the operator proficiency check.

- (iv) For a pilot operating VFR only, the checks prescribed in subparagraphs (i)(C) to (E) above may be omitted except for an approach and go-around in a multi-engine aeroplane with one engine inoperative.
    - (v) Operator proficiency checks must be conducted by a type rating examiner.
  - 2. Emergency and safety equipment checks. The items to be checked shall be those for which training has been carried out in accordance with subparagraph (a)3 above.
  - 3. Line checks;
    - (i) Line checks must establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of the equipment provided, as specified in the Operations Manual.
    - (ii) The flight crew must be assessed on their crew resource management CRM skills in accordance with a methodology acceptable to the Authority and published in the Operations Manual. The purpose of such assessment is to:
      - (A) provide feedback to the crew collectively and individually and serve to identify retraining; and
      - (B) be used to improve the CRM training system.
    - (iii) CRM assessment alone shall not be used as a reason for a failure of the line check.
    - (iv) When pilots are assigned duties as pilot flying and pilot non-flying they must be checked in both functions.
    - (v) Line checks must be completed in an aeroplane.
    - (vi) Line checks must be conducted by commanders nominated by the operator and acceptable to the Authority. The person conducting the line check, who is described in OPS 1.965(a)4(ii), shall be trained in CRM concepts and the assessment of CRM skills and shall occupy an observer's seat where installed. In the case of long haul operations where additional operating flight crew are carried, the person may fulfil the function of a cruise relief pilot and shall not occupy either pilot's seat during take-off, departure, initial cruise, descent, approach and landing. His/her CRM assessments shall solely be based on observations made during the initial briefing, cabin briefing, cockpit briefing and those phases where he/she occupies the observer's seat.
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*Appendix 2 to OPS 1.965***Recurrent training and checking — System panel operators**

- (a) The recurrent training and checking for system panel operators shall meet the requirements for pilots and any additional specific duties, omitting those items that do not apply to system panel operators.
  - (b) Recurrent training and checking for system panel operators shall, whenever possible, take place concurrently with a pilot undergoing recurrent training and checking.
  - (c) A line check shall be conducted by a commander nominated by the operator and acceptable to the Authority or by a system panel operator type rating instructor or examiner.
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*Appendix 1 to OPS 1.968***Pilot qualification to operate in either pilot's seat**

- (a) Commanders whose duties also require them to operate in the right-hand seat and carry out the duties of co-pilot, or commanders required to conduct training or examining duties from the right-hand seat, shall complete additional training and checking as specified in the Operations Manual, concurrent with the operator proficiency checks prescribed in OPS 1.965(b). This additional training must include at least the following:
    - 1. an engine failure during take-off;
    - 2. a one engine inoperative approach and go-around; and
    - 3. a one engine inoperative landing.
  - (b) When engine-out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.
  - (c) When operating in the right-hand seat, the checks required by OPS for operating in the left-hand seat must, in addition, be valid and current.
  - (d) A pilot relieving the commander shall have demonstrated, concurrent with the operator proficiency checks prescribed in OPS 1.965(b), practice of drills and procedures, which would not, normally, be the relieving pilot's responsibility. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.
  - (e) A pilot other than the commander occupying the left-hand seat shall demonstrate practice of drills and procedures, concurrent with the operator proficiency checks prescribed in OPS 1.965(b), which would otherwise have been the commander's responsibility acting as pilot non-flying. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.
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*Appendix 1 to OPS 1.978***Alternative training and qualification programme**

- (a) An operator's ATQP may apply to the following requirements that relate to training and qualifications:
1. OPS 1.450 and Appendix 1 to OPS 1.450 — Low Visibility Operations –Training and Qualifications;
  2. OPS 1.945 Conversion training and checking and Appendix 1 to OPS 1.945;
  3. OPS 1.950 Differences training and familiarisation training;
  4. OPS 1.955 paragraph (b) — Nomination as commander;
  5. OPS 1.965 Recurrent training and checking and Appendices 1 and 2 to OPS 1.965;
  6. OPS 1.980 Operation on more than one type or variant and Appendix 1 to OPS 1.980.
- (b) Components of the ATQP — an alternative training and qualification programme shall comprise the following:
1. Documentation that details the scope and requirements of the programme;
  2. A task analysis to determine the tasks to be analysed in terms of:
    - (i) knowledge;
    - (ii) the required skills;
    - (iii) the associated skill based training;and, where appropriate
  - (iv) the validated behavioural markers.
  3. Curricula — the curriculum structure and content shall be determined by task analysis, and shall include proficiency objectives including when and how those objectives shall be met. The process for curriculum development shall be acceptable to the Authority;
  4. A specific training programme for:
    - (i) each aeroplane type/class within the ATQP;
    - (ii) the instructors (Class rating instructor rating/Synthetic flight instructor authorisation/Type rating instructor rating — CRI/SFI/TRI), and other personnel undertaking flight crew instruction;
    - (iii) the examiners (Class rating examiner/Synthetic flight examiner/Type rating examiner — CRE/SFE/TRE); to include a method for the standardisation of the instructors and examiners;
  5. A feedback loop for the purpose of curriculum validation and refinement, and to ascertain that the programme meets its proficiency objectives;
  6. A method for the assessment of flight crew both during conversion and recurrent training and checking. The assessment process shall include event-based assessment as part of the LOE. The method of assessment shall comply with the provisions of OPS 1.965;
  7. An integrated system of quality control, that ensures compliance with all the requirements processes and procedures of the programme;
  8. A process that describes the method to be used if the monitoring and evaluation programmes do not ensure compliance with the established proficiency and qualification standards for flight crew;
  9. A data monitoring/analysis programme.

- (c) Implementation — The operator shall develop an evaluation and implementation strategy acceptable to the Authority; the following requirements shall be fulfilled:

1. The implementation process shall include the following stages:

(i) a safety case that substantiates the validity of:

(A) the revised training and qualification standards when compared with the standards achieved under OPS 1 prior to the introduction of ATQP.

(B) any new training methods implemented as part of ATQP.

If approved by the Authority the operator may establish an equivalent method other than a formal safety case.

(ii) Undertake a task analysis as required by paragraph (b)2 above in order to establish the operator's programme of targeted training and the associated training objectives.

(iii) A period of operation whilst data is collected and analysed to ensure the efficacy of the safety case or equivalent and validate the task analysis. During this period the operator shall continue to operate to the pre-ATQP OPS 1 requirements. The length of this period shall be agreed with the authority;

2. The operator may then be approved to conduct training and qualification as specified under the ATQP.

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*Appendix 1 to OPS 1.980***Operation on more than one type or variant**

- (a) When a flight crew member operates more than one aeroplane class, type or variant listed according to applicable flight crew licensing requirements and associated procedures for class-single pilot and/or type-single pilot, but not within a single licence endorsement, an operator must comply with the following:
1. A flight crew member shall not operate more than:
    - (i) three piston-engined aeroplane types or variants; or
    - (ii) three turbo propeller aeroplane types or variants; or
    - (iii) one turbo-propeller aeroplane type or variant and one piston engined aeroplane type or variant; or.
    - (iv) one turbo-propeller aeroplane type or variant and any aeroplane within a particular class.
  2. OPS 1.965 for each type or variant operated unless the operator has demonstrated specific procedures and/or operational restrictions, which are acceptable to the Authority.
- (b) When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsement as defined by flight crew licensing and associated procedures for type — multi-pilot, an operator shall ensure that:
1. the minimum flight crew complement specified in the Operations Manual is the same for each type or variant to be operated;
  2. a flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required; and
  3. only aeroplanes within one licence endorsement are flown in any one flight duty period unless the operator has established procedures to ensure adequate time for preparation.
- Note:* In cases where more than one licence endorsement is involved, see subparagraphs (c) and (d) below.
- (c) When a flight crew member operates more than one aeroplane type or variant listed in Flight Crew Licensing and associated procedures for type single pilot and type multi pilot, but not within a single licence endorsement, an operator must comply with the following:
1. subparagraphs (b)1, (b)2 and (b)3 above;
  2. subparagraph (d) below.
- (d) When a flight crew member operates more than one aeroplane type or variant listed in Flight Crew Licensing and associated procedures for type — multi-pilot, but not within a single licence endorsement, an operator must comply with the following:
1. subparagraphs (b)1, (b)2 and (b)3 above;
  2. before exercising the privileges of two licence endorsements:
    - (i) flight crew members must have completed two consecutive operator proficiency checks and must have 500 hours in the relevant crew position in commercial air transport operations with the same operator.
    - (ii) in the case of a pilot having experience with an operator and exercising the privileges of two licence endorsements, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is six months and 300 hours, and the pilot must have completed two consecutive operator proficiency checks before again being eligible to exercise two licence endorsements;



3. before commencing training for and operation of another type or variant, flight crew members must have completed three months and 150 hours flying on the base aeroplane, and this must include at least one proficiency check;
  4. after completion of the initial line check on the new type, 50 hours flying or 20 sectors must be achieved solely on aeroplanes of the new type rating;
  5. OPS 1.970 for each type operated unless credits have been allowed by the Authority in accordance with subparagraph 7 below;
  6. the period within which line flying experience is required on each type must be specified in the Operations Manual;
  7. where credits are sought to reduce the training and checking and recent experience requirements between aeroplane types, the operator must demonstrate to the Authority which items need not be repeated on each type or variant because of similarities
    - (i) OPS 1.965(b) requires two operator proficiency checks every year. When credit is given in accordance with sub paragraph 7 above for operator proficiency checks to alternate between the two types, each operator proficiency check revalidates the operator proficiency check for the other type. Provided that the period between Licence proficiency checks does not exceed that prescribed in the applicable regulation in the field of Flight Crew Licensing for each type, the relevant requirements on Flight Crew Licensing will be satisfied. In addition relevant and approved recurrent training must be specified in the Operations Manual.
    - (ii) OPS 1.965(c) requires one line check every year. When credit is given in accordance with subparagraph 7 above for line checks to alternate between types or variants, each line check revalidates the line check for the other type or variant.
    - (iii) annual emergency and safety equipment training and checking must cover all requirements for each type;
  8. OPS 1.965 for each type or variant operated unless credits have been allowed by the Authority in accordance with subparagraph 7. above.
- (e) When a flight crew member operates combinations of aeroplane types or variants as defined in Flight Crew Licensing and associated procedures for class — single pilot and type — multi-pilot an operator must demonstrate that specific procedures and/or operational restrictions are approved in accordance with OPS 1.980(d).
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## SUBPART O

## CABIN CREW

## OPS 1.988

**Applicability**

An operator shall ensure that all cabin crew members comply with the requirements of this Subpart and any other safety requirements applicable to cabin crew.

For the purpose of this Regulation, "cabin crew member" means any crew member, other than a flight crew member, who performs, in the interests of safety of passengers, duties assigned to him/her by the operator or the commander in the cabin of an aeroplane.

## OPS 1.989

**Identification**

- (a) An operator shall ensure that all cabin crew members wear the operator's cabin crew uniform and are clearly identifiable to the passengers as a cabin crew member.
- (b) Other personnel, such as medical staff, security staff, child minders, escorts, technical staff, entertainers, interpreters, who undertake tasks in the cabin, shall not wear a uniform which might identify them to passengers as a cabin crew member, unless they comply with the requirements of this Subpart and any other applicable requirements of this Regulation.

## OPS 1.990

**Number and composition of cabin crew**

- (a) An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 19, when carrying one or more passengers, unless at least one cabin crew member is included in the crew for the purpose of performing duties, specified in the Operations Manual, in the interests of the safety of passengers.
- (b) When complying with subparagraph (a) above, an operator shall ensure that the minimum number of cabin crew is the greater of:
  - 1. one cabin crew member for every 50, or fraction of 50, passenger seats installed on the same deck of the aeroplane; or
  - 2. the number of cabin crew who actively participated in the aeroplane cabin during the relevant emergency evacuation demonstration, or who were assumed to have taken part in the relevant analysis, except that, if the maximum approved passenger seating configuration is less than the number evacuated during the demonstration by at least 50 seats, the number of cabin crew may be reduced by 1 for every whole multiple of 50 seats by which the maximum approved passenger seating configuration falls below the certificated maximum capacity.
- (c) The Authority may under exceptional circumstances require an operator to include in the crew additional cabin crew members.
- (d) In unforeseen circumstances the required minimum number of cabin crew may be reduced provided that:
  - 1. the number of passengers has been reduced in accordance with procedures specified in the Operations Manual; and
  - 2. a report is submitted to the Authority after completion of the flight.
- (e) An operator shall ensure that when engaging the services of cabin crew members who are self-employed and/or working on a freelance or part-time basis, the requirements of subpart O are complied with. In this respect, particular attention must be paid to the total number of aircraft types or variants that a cabin crew member may fly for the purposes of commercial air transportation, which must not exceed the requirements prescribed in OPS 1.1030, including when his/her services are engaged by another operator.

## OPS 1.995

**Minimum requirements**

An operator shall ensure that each cabin crew member:

- (a) is at least 18 years of age;
- (b) has passed a medical examination or assessment at regular intervals as required by the Authority so as to check the medical fitness to discharge his/her duties;
- (c) has successfully completed initial training in accordance with OPS 1.1005 and holds an attestation of safety training;
- (d) has completed the appropriate conversion and/or differences training covering at least the subjects listed in OPS 1.1010;
- (e) shall undergo recurrent training in line with the provisions of OPS 1.1015;
- (f) is competent to perform his/her duties in accordance with procedures specified in the Operations Manual.

## OPS 1.1000

**Senior cabin crew members**

- (a) An operator shall nominate a senior cabin crew member whenever more than one cabin crew member is assigned. For operations when more than one cabin crew member is assigned, but only one cabin crew member is required, the operator shall nominate one cabin crew member to be responsible to the commander.
- (b) The senior cabin crew member shall have responsibility to the commander for the conduct and coordination of normal and emergency procedure(s) specified in the Operations Manual. During turbulence, in the absence of any instructions from the flight crew, the senior cabin crew member shall be entitled to discontinue non-safety related duties and advise the flight crew of the level of turbulence being experienced and the need for the fasten seat belt signs to be switched on. This should be followed by the cabin crew securing the passenger cabin and other applicable areas.
- (c) Where required by OPS 1.990 to carry more than one cabin crew member, an operator shall not appoint a person to the post of senior cabin crew member unless that person has at least one year's experience as an operating cabin crew member and has completed an appropriate course covering the following as a minimum:
  - 1. pre-flight briefing:
    - (i) operating as a crew,
    - (ii) allocation of cabin crew stations and responsibilities,
    - (iii) consideration of the particular flight, including aeroplane type, equipment, area and type of operation, and categories of passengers with particular attention to disabled, infants and stretcher cases, and
  - 2. cooperation within the crew:
    - (i) discipline, responsibilities and chain of command,
    - (ii) importance of coordination and communication,
    - (iii) pilot incapacitation, and
  - 3. review of operator's requirements and legal requirements:
    - (i) passenger safety briefing, safety cards,
    - (ii) securing of galleys,

- (iii) stowage of cabin baggage,
  - (iv) electronic equipment,
  - (v) procedures when fuelling with passengers on board,
  - (vi) turbulence,
  - (vii) documentation, and
- 4. human factors and crew resource management, and
  - 5. accident and incident reporting, and
  - 6. flight and duty time limitations and rest requirements.
- (d) An operator shall establish procedures to select the next most suitably qualified cabin crew member to operate as senior cabin crew member in the event of the nominated senior cabin crew member becoming unable to operate. Such procedures must be acceptable to the Authority and take account of a cabin crew member's operational experience.
  - (e) CRM training: the operator shall ensure that all relevant elements in Appendix 2 to OPS1.1005/1.1010/1.1015 Table 1, Column (a) are integrated into the training and covered to the level required by Column (f), senior cabin crew course.

#### OPS 1.1002

##### **Single cabin crew member operations**

- (a) An operator shall ensure that each cabin crew member who does not have previous comparable experience completes the following, before operating as a single cabin crew member:
  - 1. Training in addition to that required by OPS 1.1005 and OPS 1.1010 shall include particular emphasis on the following to reflect single cabin crew member operations:
    - (i) responsibility to the commander for the conduct of cabin safety and emergency procedure(s) specified in the Operations Manual;
    - (ii) importance of coordination and communication with the flight crew, management of unruly or disruptive passengers;
    - (iii) review of operator's requirements and legal requirements;
    - (iv) documentation;
    - (v) accident and incident reporting;
    - (vi) flight and duty time limitations.
  - 2. Familiarisation flying of at least 20 hours and 15 sectors. Familiarisation flights shall be conducted under the supervision of a suitably experienced cabin crew member on the aeroplane type to be operated.
- (b) An operator shall ensure, before a cabin crew member is assigned to operate as a single cabin crew member, that this cabin crew member is competent to perform his/her duties in accordance with the procedures specified in the Operations Manual. Suitability for single cabin crew operations shall be addressed in the criteria for cabin crew selection, recruitment, training and assessment of competence.

#### OPS 1.1005

##### **Initial safety training**

(See Appendix 1 to OPS 1.1005 and Appendix 3 to OPS 1.1005/1.1010/1.1015)

- (a) An operator shall ensure that each cabin crew member has, before undertaking conversion training, successfully completed initial safety training covering at least the subjects listed in Appendix 1 to OPS 1.1005.

- (b) Training courses shall, at the discretion of the Authority, and subject to its approval, be provided:
- either
1. by the operator
    - directly, or
    - indirectly through a training organisation acting on behalf of the operator; or
  2. by an approved training organisation.
- (c) The programme and structure of the initial training courses shall be in accordance with the applicable requirements and shall be subject to prior approval of the Authority.
- (d) At the discretion of the Authority, the Authority, the operator or the approved training organisation providing the training course, shall deliver an attestation of safety training to a cabin crew member after he/she has completed the initial safety training and successfully passed the check referred to in OPS 1.1025.
- (e) Where the Authority authorises an operator or an approved training organisation to deliver the attestation of safety training to a cabin crew member, such attestation shall clearly state a reference to the approval of the Authority.

*OPS 1.1010*

**Conversion and differences training**

(See Appendix 1 to OPS 1.1010 and Appendix 3 to OPS 1.1005/1.1010/1.1015)

- (a) An operator shall ensure that each cabin crew member has completed appropriate conversion and differences training, in accordance with the applicable rules and at least the subjects listed in Appendix 1 to OPS 1.1010. The training course shall be specified in the Operations Manual. The programme and structure of the training course shall be subject to prior approval by the Authority.
1. Conversion training: A conversion course must be completed before being:
    - (i) first assigned by the operator to operate as a cabin crew member; or
    - (ii) assigned to operate another aeroplane type; and
  2. Differences training: differences training must be completed before operating:
    - (i) on a variant of an aeroplane type currently operated; or
    - (ii) with different safety equipment, safety equipment location, or normal and emergency safety procedures on currently operated aeroplane types or variants.
- (b) An operator shall determine the content of the conversion and differences training taking account of the cabin crew member's previous training as recorded in the cabin crew member's training records required by OPS 1.1035.
- (c) Without prejudice to OPS 1.995 (c), related elements of both initial training (OPS 1.1005) and conversion and differences training (OPS 1.1010) may be combined.
- (d) An operator shall ensure that:
1. conversion training is conducted in a structured and realistic manner, in accordance with Appendix 1 to OPS 1.1010;
  2. differences training is conducted in a structured manner; and
  3. conversion training, and if necessary differences training, includes the use of all safety equipment and all normal and emergency procedures applicable to the type or variant of aeroplane and involves training and practice on either a representative training device or on the actual aeroplane.

- (e) An operator shall ensure that each cabin crew member before being first assigned to duties completes the operator's CRM training and aeroplane type specific CRM, in accordance with Appendix 1 to OPS 1.1010 (j). Cabin crew who are already operating as cabin crew members with an operator, and who have not previously completed the operator's CRM training, shall complete this training by the time of the next required recurrent training and checking in accordance with Appendix 1 to OPS 1.1010 (j), including aeroplane type specific CRM, as relevant.

#### OPS 1.1012

##### **Familiarisation**

An operator shall ensure that, following completion of conversion training, each cabin crew member completes familiarisation prior to operating as one of the minimum number of cabin crew required by OPS 1.990.

#### OPS 1.1015

##### **Recurrent training**

(See Appendix 1 to OPS 1.1015 and Appendix 3 to OPS 1.1005/1.1010/1.1015)

- (a) An operator shall ensure that each cabin crew member undergoes recurrent training, covering the actions assigned to each crew member in normal and emergency procedures and drills relevant to the type(s) and/or variant(s) of aeroplane on which they operate in accordance with Appendix 1 to OPS 1.1015.
- (b) An operator shall ensure that the recurrent training programme approved by the Authority includes theoretical and practical instruction, together with individual practice, as prescribed in Appendix 1 to OPS 1.1015.
- (c) The period of validity of recurrent training and the associated checking required by OPS 1.1025 shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final three calendar months of validity of a previous check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous check.

#### OPS 1.1020

##### **Refresher training**

(See Appendix 1 to OPS 1.1020)

- (a) An operator shall ensure that each cabin crew member who has been absent from all flying duties for more than 6 months and still remains within the period of the previous check required by OPS 1.1025(b)3 completes refresher training specified in the Operations Manual as prescribed in Appendix 1 to OPS 1.1020.
- (b) An operator shall ensure that when a cabin crew member has not been absent from all flying duties, but has not, during the preceding six months, undertaken duties on a type of aeroplane as a cabin crew member required by OPS 1.990 (b), before undertaking such duties on that type, the cabin crew member either:
1. completes refresher training on the type; or
  2. operates two re-familiarisation sectors during commercial operations on the type.

#### OPS 1.1025

##### **Checking**

- (a) At the discretion of the Authority, the Authority, the operator or the approved training organisation providing the training course shall ensure that during or following completion of the training required by OPS 1.1005, 1.1010, 1.1015 and 1.1020, each cabin crew member undergoes a check covering the training received in order to verify his/her proficiency in carrying out normal and emergency safety duties.

At the discretion of the Authority, the Authority, the operator or the approved training organisation providing the training course shall ensure that the personnel performing these checks shall be suitably qualified.

- (b) An operator shall ensure that each cabin crew member undergoes checks as follows:
1. initial safety training. The items listed in Appendix 1 to OPS 1.1005;
  2. conversion and differences training. The items listed in Appendix 1 to OPS 1.1010;
  3. recurrent training. The items listed in Appendix 1 to OPS 1.1015 as appropriate; and
  4. refresher training. The items listed in Appendix 1 to OPS 1.1020.

#### *OPS 1.1030*

##### **Operation on more than one type or variant**

- (a) An operator shall ensure that each cabin crew member does not operate on more than three aeroplane types except that, with the approval of the Authority, the cabin crew member may operate on four aeroplane types, provided that for at least two of the types:
1. non-type specific normal and emergency procedures are identical; and
  2. safety equipment and type specific normal and emergency procedures are similar.
- (b) For the purposes of subparagraph (a) above, variants of an aeroplane type are considered to be different types if they are not similar in all the following aspects:
1. emergency exit operation;
  2. location and type of portable safety equipment; and
  3. type specific emergency procedures.

#### *OPS 1.1035*

##### **Training records**

An operator shall:

1. maintain records of all training and checking required by OPS 1.1005, 1.1010, 1.1015, 1.1020 and 1.1025; and
  2. keep a copy of the attestation of safety training; and
  3. keep the training records and records of medical examinations or assessments up to date, showing in the case of the training records the dates and contents of the conversion, differences and recurrent training received; and
  4. make the records of all initial, conversion and recurrent training and checking available, on request, to the cabin crew member concerned.
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*Appendix 1 to OPS 1.1005***Initial safety training**

The subjects that must be covered as a minimum by a course of initial safety training referred to in OPS 1.1005 are:

(a) Fire and smoke training:

1. emphasis on the responsibility of cabin crew to deal promptly with emergencies involving fire and smoke and, in particular, emphasis on the importance of identifying the actual source of the fire;
2. the importance of informing the flight crew immediately, as well as the specific actions necessary for coordination and assistance, when fire or smoke is discovered;
3. the necessity for frequent checking of potential fire-risk areas including toilets, and the associated smoke detectors;
4. the classification of fires and the appropriate type of extinguishing agents and procedures for particular fire situations, the techniques of application of extinguishing agents, the consequences of misapplication, and of use in a confined space; and
5. the general procedures of ground-based emergency services at aerodromes.

(b) Water survival training.

The actual donning and use of personal flotation equipment in water. Before first operating on an aeroplane fitted with life-rafts or other similar equipment, training must be given on the use of this equipment, as well as actual practice in water.

(c) Survival training.

Survival training shall be appropriate to the areas of operation (e.g. polar, desert, jungle or sea).

(d) Medical aspects and first aid:

1. instruction on medical aspects and first-aid, first-aid kits, emergency medical kits, their contents and emergency medical equipment;
2. first-aid associated with survival training and appropriate hygiene; and
3. the physiological effects of flying and with particular emphasis on hypoxia.

(e) Passenger handling:

1. advice on the recognition and management of passengers who are, or become, intoxicated with alcohol or are under the influence of drugs or are aggressive;
2. methods used to motivate passengers and the crowd control necessary to expedite an aeroplane evacuation;
3. regulations covering the safe stowage of cabin baggage (including cabin service items) and the risk of it becoming a hazard to occupants of the cabin or otherwise obstruction or damaging emergency equipment or aeroplane exits;
4. the importance of correct seat allocation with reference to aeroplane mass and balance. Particular emphasis shall also be given on the seating of disabled passengers, and the necessity of seating able-bodied passengers adjacent to unsupervised exits;
5. duties to be undertaken in the event of encountering turbulence, including securing the cabin;
6. precautions to be taken when live animals are carried in the cabin;
7. dangerous goods training, including provisions under Subpart R;
8. security procedures, including provisions under Subpart S.



(f) Communication.

During training, emphasis shall be placed on the importance of effective communication between cabin crew and flight crew including technique, common language and terminology.

(g) Discipline and responsibilities:

1. the importance of cabin crew performing their duties in accordance with the Operations Manual;
2. continuing competence and fitness to operate as a cabin crew member with special regard to flight and duty time limitations and rest requirements;
3. an awareness of the aviation regulations relating to cabin crew and the role of the Civil Aviation Authority;
4. general knowledge of relevant aviation terminology, theory of flight, passenger distribution, meteorology and areas of operation;
5. pre-flight briefing of the cabin crew and the provision of necessary safety information with regards to their specific duties;
6. the importance of ensuring that relevant documents and manuals are kept up-to-date with amendments provided by the operator;
7. the importance of identifying when cabin crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and
8. the importance of safety duties and responsibilities and the need to respond promptly and effectively to emergency situations.
9. awareness of the effects of surface contamination and the need to inform the flight crew of any observed surface contamination.

(h) Crew resource management.

1. Introductory CRM course:
    - (i) a cabin crew member shall complete an introductory CRM course before being first assigned to operate as a cabin crew member. Cabin crew who are already operating as cabin crew members in commercial air transportation and who have not previously completed an introductory course, shall complete an introductory CRM course by the time of the next required recurrent training and/or checking.
    - (ii) The training elements in Appendix 2 to OPS 1.1005/1.1010/1/1.1015 Table 1, Column (a) shall be covered to the level required in Column (b), introductory CRM course.
    - (iii) The introductory CRM course shall be conducted by at least one cabin crew CRM instructor.
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*Appendix 1 to OPS 1.1010***Conversion and differences training**

## (a) General:

An operator shall ensure that:

1. conversion and differences training is conducted by suitably qualified personnel; and
2. during conversion and differences training, training is given on the location, removal and use of all safety and survival equipment carried on the aeroplane, as well as all normal and emergency procedures related to the aeroplane type, variant and configuration to be operated.

## (b) Fire and smoke training:

An operator shall ensure that:

1. each cabin crew member is given realistic and practical training in the use of all fire-fighting equipment including protective clothing representative of that carried in the aeroplane. This training must include:
  - (i) extinguishing a fire characteristic of an aeroplane interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and
  - (ii) the donning and use of protective breathing equipment in an enclosed, simulated smoke-filled environment.

## (c) Operations of doors and exits:

An operator shall ensure that:

1. each cabin crew member operates and actually opens each type or variant of normal and emergency exits in the normal and emergency modes, including failure of power assist systems where fitted. This is to include the action and forces required to operate and deploy evacuation slides. This training shall be conducted in an aeroplane or representative training device; and
2. the operation of all other exits, such as flight deck windows is demonstrated.

## (d) Evacuation slide training:

An operator shall ensure that:

1. each cabin crew member descends an evacuation slide from a height representative of the aeroplane's main deck sill height;
2. the slide is fitted to an aeroplane or a representative training device; and
3. a further descent is made when the cabin crew member qualifies on an aeroplane type in which the main deck exit sill height differs significantly from any aeroplane type previously operated.

## (e) Evacuation procedures and other emergency situations:

An operator shall ensure that:

1. emergency evacuation training includes the recognition of planned or unplanned evacuations on land or water. This training must include recognition of when exits are unusable or when evacuation equipment is unserviceable; and
2. each cabin crew member is trained to deal with the following:
  - (i) an in-flight fire, with particular emphasis on identifying the actual source of the fire;

- (ii) severe air turbulence;
  - (iii) sudden decompression, including the donning of portable oxygen equipment by each cabin crew member; and
  - (iv) other in-flight emergencies.
- (f) Crowd control.

An operator shall ensure that training is provided on the practical aspects of crowd control in various emergency situations, as applicable to the aeroplane type.

- (g) Pilot incapacitation.

An operator shall ensure that, unless the minimum flight crew is more than two, each cabin crew member is trained in the procedure for flight crew member incapacitation and shall operate the seat and harness mechanisms. Training in the use of flight crew members' oxygen system and use of the flight crew members' check lists, where required by the operator's SOP's, shall be conducted by a practical demonstration.

- (h) Safety equipment.

An operator shall ensure that each cabin crew member is given realistic training on, and demonstration of, the location and use of safety equipment including the following:

1. slides, and where non-self-supporting slides are carried, the use of any associated ropes;
2. life-rafts and slide-raft, including the equipment attached to, and/or carried in, the raft;
3. lifejackets, infant lifejackets and flotation cots;
4. dropout oxygen system;
5. first-aid oxygen;
6. fire extinguishers;
7. fire axe or crow-bar;
8. emergency lights including torches;
9. communication equipment, including megaphones;
10. survival packs, including their contents;
11. pyrotechnics (actual or representative devices);
12. first-aid kits, emergency medical kits, their contents and emergency medical equipment; and
13. other cabin safety equipment or systems where applicable.

- (i) Passenger briefing/safety demonstrations.

An operator shall ensure that training is given in the preparation of passengers for normal and emergency situations in accordance with OPS 1.285.

- (j) When initial medical aspects and first aid training has not included the avoidance of infectious diseases, especially in tropical and sub-tropical climates, such training shall be provided if an operator's route network is extended or changed to include such areas.

- (k) Crew resource management. An operator shall ensure that:
1. Each cabin crew member completes the operator's CRM training covering the training elements in Appendix 2 to OPS 1.1005/1.1010/1.1015 Table 1, Column (a) to the level required in Column (c) before undertaking subsequent aeroplane type specific CRM and/or recurrent CRM training.
  2. When a cabin crew member undertakes a conversion course on another aeroplane type, the training elements in Appendix 2 to OPS 1.1005/1.1010/1.1015 Table 1, Column (a) shall be covered to the level required in Column (d), aeroplane type specific CRM.
  3. The operator's CRM training and aeroplane type specific CRM shall be conducted by a least one cabin crew CRM instructor.
-

*Appendix 1 to OPS 1.1015***Recurrent training**

- (a) An operator shall ensure that recurrent training is conducted by suitably qualified persons.
- (b) An operator shall ensure that every 12 calendar months the programme of practical training includes the following:
1. emergency procedures including pilot incapacitation;
  2. evacuation procedures including crowd control techniques;
  3. touch-drills by each cabin crew member for opening normal and emergency exits for passenger evacuation;
  4. the location and handling of emergency equipment, including oxygen systems, and the donning by each cabin crew member of lifejackets, portable oxygen and protective breathing equipment (PBE);
  5. medical aspects and first-aid, first-aid kits, emergency medical kits, their contents and emergency medical equipment;
  6. stowage of articles in the cabin;
  7. security procedures;
  8. incident and accident review;
  9. awareness of the effects of surface contamination and the need to inform the flight crew of any observed surface contamination, and
  10. crew resource management. An operator shall ensure that CRM training satisfies the following:
    - (i) the training elements in Appendix 2 to OPS 1.1005/1.1010/1/1.1015 Table 1, Column (a) shall be covered within a three year cycle to the level required by Column (e), Annual Recurrent CRM Training;
    - (ii) the definition and implementation of this syllabus shall be managed by a cabin crew CRM instructor;
    - (iii) when CRM training is provided by stand-alone modules, it shall be conducted by at least one cabin crew CRM instructor.
- (c) An operator shall ensure that, at intervals not exceeding three years, recurrent training also includes:
1. each cabin crew member operating and actually opening each type or variant of normal and emergency exit in the normal and emergency modes, including failure of power assist systems where fitted. This is to include the action and forces required to operate and deploy evacuation slides. This training shall be conducted in an aeroplane or representative training device;
  2. demonstration of the operation of all other exits including flight deck windows;
  3. each cabin crew member being given realistic and practical training in the use of all fire-fighting equipment, including protective clothing, representative of that carried in the aircraft.

This training must include:

- (i) each cabin crew member extinguishing a fire characteristic of an aeroplane interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and
- (ii) the donning and use of protective breathing equipment by each cabin crew member in an enclosed, simulated smoke-filled environment;

4. use of pyrotechnics (actual or representative devices); and
  5. demonstration of the use of the life-raft, or slide-raft, where fitted;
  6. an operator shall ensure that, unless the minimum flight crew is more than two, each cabin crew member is trained in the procedure for flight crew member incapacitation and shall operate the seat and harness mechanisms. Training in the use of flight crew members' oxygen system and use of the flight crew members' check lists, where required by the operator's SOPs, shall be conducted by a practical demonstration
- (d) An operator shall ensure that all appropriate requirements of Annex III, OPS 1 are included in the training of cabin crew members.
-

*Appendix 1 to OPS 1.1020***Refresher training**

An operator shall ensure that refresher training is conducted by suitable qualified persons and, for each cabin crew member, includes at least the following:

1. emergency procedures including pilot incapacitation;
  2. evacuation procedures including crowd control techniques;
  3. the operation and actual opening of each type or variant of normal and emergency exit in the normal and emergency modes, including failure of power assist systems where fitted. This is to include the action and forces required to operate and deploy evacuation slides. This training shall be conducted in an aeroplane or representative training device;
  4. demonstration of the operation of all other exits including flight deck windows; and
  5. the location and handling of emergency equipment, including oxygen systems, and the donning of lifejackets, portable oxygen and protective breathing equipment.
-

## Appendix 2 to OPS 1.1005/1.1010/1.1015

**Training**

1. The CRM training syllabi, together with CRM methodology and terminology, shall be included in the Operations Manual.
2. Table 1 indicates which elements of CRM shall be included in each type of training.

Table 1

**CRM training:**

Training elements  (a)	Introductory CRM course  (b)	Operator's CRM training  (c)	Aeroplane type specific CRM  (d)	Annual recurrent CRM training  (e)	Senior cabin crew course  (f)
General Principles					
Human factors in aviation General instructions on CRM principles and objectives	In depth	Not required	Not required	Not required	Overview
Human performance and limitations					
From the perspective of the individual cabin crew member					
Personality awareness, human error and reliability, attitudes and behaviours, self-assessment	In depth	Not required	Not required	Overview  (three year cycle)	Not required
Stress and stress management					
Fatigue and vigilance					
Assertiveness					
Situation awareness, information acquisition and processing					
From the perspective of the whole aeroplane crew					
Error prevention and detection	Not required	In-depth	Relevant to the type(s)	Overview  (three year cycle)	Reinforcement  (relevant to the Senior cabin crew duties)
Shared situation awareness, information acquisition and processing					
Workload management					
Effective communication and coordination between all crew members including the flight crew as well as inexperienced cabin crew members, cultural differences					
Leadership, cooperation, synergy, decision-making, delegation					
Individual and team responsibilities, decision making, and actions					
Identification and management of the passenger human factors: crowd control, passenger stress, conflict management, medical factors					
Specifics related to aeroplane types (narrow/wide bodies, single/multi deck), flight crew and cabin crew composition and number of passengers		Not required	In depth		



Training elements  (a)	Introductory CRM course  (b)	Operator's CRM training  (c)	Aeroplane type specific CRM  (d)	Annual recurrent CRM training  (e)	Senior cabin crew course  (f)
From the perspective of the operator and the organisation					
Company safety culture, SOPs, organisational factors, factors linked to the type of operations	Not required	In depth	Relevant to the type(s)	Overview  (three year cycle)	Reinforce- ment  (relevant to the Senior cabin crew duties)
Effective communication and coordination with other operational personnel and ground services					
Participation in cabin safety incident and accident reporting					
Case based studies (see note)		Required		Required	
Note: In Column (d), if relevant aeroplane type specific case based studies are not available, then case based studies relevant to the scale and scope of the operation shall be considered.					

*Appendix 3 to OPS 1.1005/1.1010/1.1015***Medical aspects and first aid training**

- (a) Medical aspects and first aid training shall include the following subjects:
1. physiology of flight including oxygen requirements and hypoxia;
  2. medical emergencies in aviation including:
    - (i) asthma;
    - (ii) choking;
    - (iii) heart attacks;
    - (iv) stress reactions and allergic reactions;
    - (v) shock;
    - (vi) stroke;
    - (vii) epilepsy;
    - (viii) diabetes;
    - (ix) air sickness;
    - (x) hyperventilation;
    - (xi) gastro-intestinal disturbances; and
    - (xii) emergency childbirth;
  3. practical cardio-pulmonary resuscitation by each cabin crew member having regard to the aeroplane environment and using a specifically designed dummy;
  4. basic first aid and survival training including care of:
    - (i) the unconscious;
    - (ii) burns;
    - (iii) wounds; and
    - (iv) fractures and soft tissue injuries;
  5. travel health and hygiene including:
    - (i) the risk of contact with infectious diseases especially when operating into tropical and sub-tropical areas. Reporting of infectious diseases, protection from infection and avoidance of water-borne and food-borne illness. Training shall include the means to reduce such risks;
    - (ii) hygiene on board;
    - (iii) death on board;
    - (iv) handling of clinical waste;
    - (v) aircraft disinfection; and
    - (vi) alertness management, physiological effects of fatigue, sleep physiology, circadian rhythm and time zone changes;
  6. The use of appropriate aeroplane equipment including first aid kits, emergency medical kits, first aid oxygen and emergency medical equipment.
-

## SUBPART P

## MANUALS, LOGS AND RECORDS

## OPS 1.1040

**General rules for operations manuals**

- (a) An operator shall ensure that the Operations Manual contains all instructions and information necessary for operations personnel to perform their duties.
- (b) An operator shall ensure that the contents of the Operations Manual, including all amendments or revisions, do not contravene the conditions contained in the Air Operator Certificate (AOC) or any applicable regulations and are acceptable to, or, where applicable, approved by, the Authority.
- (c) Unless otherwise approved by the Authority, or prescribed by national law, an operator must prepare the Operations Manual in the English language. In addition, an operator may translate and use that manual, or parts thereof, into another language.
- (d) Should it become necessary for an operator to produce new Operations Manuals or major parts/volumes thereof, he must comply with subparagraph (c) above.
- (e) An operator may issue an Operations Manual in separate volumes.
- (f) An operator shall ensure that all operations personnel have easy access to a copy of each part of the Operations Manual which is relevant to their duties. In addition, the operator shall supply crew members with a personal copy of, or sections from, Parts A and B of the Operations Manual as are relevant for personal study.
- (g) An operator shall ensure that the Operations Manual is amended or revised so that the instructions and information contained therein are kept up to date. The operator shall ensure that all operations personnel are made aware of such changes that are relevant to their duties.
- (h) Each holder of an Operations Manual, or appropriate parts of it, shall keep it up to date with the amendments or revisions supplied by the operator.
- (i) An operator shall supply the Authority with intended amendments and revisions in advance of the effective date. When the amendment concerns any part of the Operations Manual which must be approved in accordance with OPS, this approval shall be obtained before the amendment becomes effective. When immediate amendments or revisions are required in the interest of safety, they may be published and applied immediately, provided that any approval required has been applied for.
- (j) An operator shall incorporate all amendments and revisions required by the Authority.
- (k) An operator must ensure that information taken from approved documents, and any amendment of such approved documentation, is correctly reflected in the Operations Manual and that the Operations Manual contains no information contrary to any approved documentation. However, this requirement does not prevent an operator from using more conservative data and procedures.
- (l) An operator must ensure that the contents of the Operations Manual are presented in a form in which they can be used without difficulty. The design of the Operations Manual shall observe human factors principles.
- (m) An operator may be permitted by the Authority to present the Operations Manual or parts thereof in a form other than on printed paper. In such cases, an acceptable level of accessibility, usability and reliability must be assured.
- (n) The use of an abridged form of the Operations Manual does not exempt the operator from the requirements of OPS 1.130.

## OPS 1.1045

**Operations Manual — structure and contents**

(See Appendix 1 to OPS 1.1045)

- (a) An operator shall ensure that the main structure of the Operations Manual is as follows:
- Part A: General/basic
- This part shall comprise all non type-related operational policies, instructions and procedures needed for a safe operation.
- Part B: Aeroplane operating matters
- This part shall comprise all type-related instructions and procedures needed for a safe operation. It shall take account of any differences between types, variants or individual aeroplanes used by the operator.
- Part C: Route and aerodrome instructions and information
- This part shall comprise all instructions and information needed for the area of operation.
- Part D: Training
- This part shall comprise all training instructions for personnel required for a safe operation.
- (b) An operator shall ensure that the contents of the Operations Manual are in accordance with Appendix 1 to OPS 1.1045 and relevant to the area and type of operation.
- (c) An operator shall ensure that, the detailed structure of the Operations Manual is acceptable to the Authority.

## OPS 1.1050

**Aeroplane flight manual**

An operator shall keep a current approved Aeroplane Flight Manual or equivalent document for each aeroplane that it operates.

## OPS 1.1055

**Journey log**

- (a) An operator shall retain the following information for each flight in the form of a journey log:
1. aeroplane registration;
  2. date;
  3. name(s) of crew member(s);
  4. duty assignment of crew member(s);
  5. place of departure;
  6. place of arrival;
  7. time of departure (off-block time);
  8. time of arrival (on-block time);

9. hours of flight;
  10. nature of flight;
  11. incidents, observations (if any); and
  12. commander's signature (or equivalent).
- (b) An operator may be permitted not to keep an aeroplane journey log, or parts thereof, by the Authority if the relevant information is available in other documentation.
- (c) An operator shall ensure that all entries are made concurrently and that they are permanent in nature.

OPS 1.1060

**Operational flight plan**

- (a) An operator must ensure that the operational flight plan used and the entries made during flight contain the following items:
1. aeroplane registration;
  2. aeroplane type and variant;
  3. date of flight;
  4. flight identification;
  5. names of flight crew members;
  6. duty assignment of flight crew members;
  7. place of departure;
  8. time of departure (actual off-block time, take-off time);
  9. place of arrival (planned and actual);
  10. time of arrival (actual landing and on-block time);
  11. type of operation (ETOPS, VFR, Ferry flight, etc.)
  12. route and route segments with checkpoints/waypoints, distances, time and tracks;
  13. planned cruising speed and flying times between check-points/waypoints. Estimated and actual times overhead;
  14. safe altitudes and minimum levels;
  15. planned altitudes and flight levels;
  16. fuel calculations (records of in-flight fuel checks);
  17. fuel on board when starting engines;
  18. alternate(s) for destination and, where applicable, take-off and en-route, including information required in subparagraphs 12, 13, 14, and 15 above;
  19. initial ATS flight plan clearance and subsequent re-clearance;
  20. in-flight re-planning calculations; and
  21. relevant meteorological information.

- (b) Items which are readily available in other documentation or from another acceptable source or are irrelevant to the type of operation may be omitted from the operational flight plan.
- (c) An operator must ensure that the operational flight plan and its use are described in the Operations Manual.
- (d) An operator shall ensure that all entries on the operational flight plan are made concurrently and that they are permanent in nature.

*OPS 1.1065*

**Document storage periods**

An operator shall ensure that all records and all relevant operational and technical information for each individual flight, are stored for the periods prescribed in Appendix 1 to OPS 1.1065.

*OPS 1.1070*

**Operator's continuing airworthiness management exposition**

An operator shall keep a current approved continuing airworthiness management exposition as prescribed in Part M, paragraph M.A.704 Continuing airworthiness management exposition.

*OPS 1.1071*

**Aeroplane technical log**

An operator shall keep an aeroplane technical log as prescribed in Part M, paragraph M.A.306 Operator's technical log system.

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*Appendix 1 to OPS 1.1045***Operations Manual Contents**

An operator shall ensure that the Operations Manual contains the following:

A. **GENERAL/BASIC**

0. ADMINISTRATION AND CONTROL OF OPERATIONS MANUAL

0.1. Introduction

- (a) A statement that the manual complies with all applicable regulations and with the terms and conditions of the applicable Air Operator Certificate.
- (b) A statement that the manual contains operational instructions that are to be complied with by the relevant personnel.
- (c) A list and brief description of the various parts, their contents, applicability and use.
- (d) Explanations and definitions of terms and words needed for the use of the manual.

0.2. System of amendment and revision

- (a) Details of the person(s) responsible for the issuance and insertion of amendments and revisions.
- (b) A record of amendments and revisions with insertion dates and effective dates.
- (c) A statement that handwritten amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interest of safety.
- (d) A description of the system for the annotation of pages and their effective dates.
- (e) A list of effective pages.
- (f) Annotation of changes (on text pages and, as far as practicable, on charts and diagrams).
- (g) Temporary revisions.
- (h) A description of the distribution system for the manuals, amendments and revisions.

1. ORGANISATION AND RESPONSIBILITIES

- 1.1. Organisational structure. A description of the organisational structure including the general company organigram and operations department organigram. The organigram must depict the relationship between the Operations Department and the other Departments of the company. In particular, the subordination and reporting lines of all Divisions, Departments, etc., which pertain to the safety of flight operations, must be shown.
- 1.2. Nominated postholders. The name of each nominated postholder responsible for flight operations, the maintenance system, crew training and ground operations, as prescribed in OPS 1.175(i). A description of their function and responsibilities must be included.
- 1.3. Responsibilities and duties of operations management personnel. A description of the duties, responsibilities and authority of operations management personnel pertaining to the safety of flight operations and the compliance with the applicable regulations.
- 1.4. Authority, duties and responsibilities of the commander. A statement defining the authority, duties and responsibilities of the commander.
- 1.5. Duties and responsibilities of crew members other than the commander.

## 2. OPERATIONAL CONTROL AND SUPERVISION

- 2.1. Supervision of the operation by the operator. A description of the system for supervision of the operation by the operator (see OPS 1.175(g)). This must show how the safety of flight operations and the qualifications of personnel are supervised. In particular, the procedures related to the following items must be described:
- (a) Licence and qualification validity;
  - (b) Competence of operations personnel; and
  - (c) Control, analysis and storage of records, flight documents, additional information and data.
- 2.2. System of promulgation of additional operational instructions and information. A description of any system for promulgating information which may be of an operational nature but is supplementary to that in the Operations Manual. The applicability of this information and the responsibilities for its promulgation must be included.
- 2.3. Accident prevention and flight safety programme. A description of the main aspects of the flight safety programme.
- 2.4. Operational control. A description of the procedures and responsibilities necessary to exercise operational control with respect to flight safety.
- 2.5. Powers of the Authority. A description of the powers of the Authority, and guidance to staff on how to facilitate inspections by Authority personnel.

## 3. QUALITY SYSTEM

A description of the quality system adopted including at least:

- (a) Quality policy;
- (b) A description of the organisation of the quality system; and
- (c) Allocation of duties and responsibilities.

## 4. CREW COMPOSITION

- 4.1. Crew Composition. An explanation of the method for determining crew compositions taking account of the following:
- (a) The type of aeroplane being used;
  - (b) The area and type of operation being undertaken;
  - (c) The phase of the flight;
  - (d) The minimum crew requirement and flight duty period planned;
  - (e) Experience (total and on type), recency and qualification of the crew members;
  - (f) The designation of the commander and, if necessitated by the duration of the flight, the procedures for the relief of the commander or other members of the flight crew (See Appendix 1 to OPS 1.940); and
  - (g) The designation of the senior cabin crew member and, if necessitated by the duration of the flight, the procedures for the relief of the senior cabin crew member and any other member of the cabin crew.
- 4.2. Designation of the commander. The rules applicable to the designation of the commander.
- 4.3. Flight crew incapacitation. Instructions on the succession of command in the event of flight crew incapacitation.



- 4.4. Operation of more than one type. A statement indicating which aeroplanes are considered as one type for the purpose of:
- (a) Flight crew scheduling; and
  - (b) Cabin crew scheduling.
5. QUALIFICATION REQUIREMENTS
- 5.1. A description of the required licence, rating(s), qualification/competency (e.g. for routes and aerodromes), experience, training, checking and recency for operations personnel to conduct their duties. Consideration must be given to the aeroplane type, kind of operation and composition of the crew.
- 5.2. Flight crew
- (a) Commander.
  - (b) Pilot relieving the commander.
  - (c) Co-pilot.
  - (d) Pilot under supervision.
  - (e) System panel operator.
  - (f) Operation on more than one type or variant.
- 5.3. Cabin crew.
- (a) Senior cabin crew member.
  - (b) Cabin crew member.
    - (i) Required cabin crew member.
    - (ii) Additional cabin crew member and cabin crew member during familiarisation flights.
  - (c) Operation on more than one type or variant.
- 5.4. Training, checking and supervision personnel.
- (a) For flight crew.
  - (b) For cabin crew.
- 5.5. Other operations personnel
6. CREW HEALTH PRECAUTIONS
- 6.1. Crew health precautions. The relevant regulations and guidance to crew members concerning health including:
- (a) Alcohol and other intoxicating liquor;
  - (b) Narcotics;
  - (c) Drugs;
  - (d) Sleeping tablets;
  - (e) Pharmaceutical preparations;
  - (f) Immunisation;
  - (g) Deep diving;

- (h) Blood donation;
  - (i) Meal precautions prior to and during flight;
  - (j) Sleep and rest; and
  - (k) Surgical operations.
7. FLIGHT TIME LIMITATIONS
- 7.1. Flight and duty time limitations and rest requirements. The scheme developed by the operator in accordance with applicable requirements.
- 7.2. Exceedances of flight and duty time limitations and/or reductions of rest periods. Conditions under which flight and duty time may be exceeded or rest periods may be reduced and the procedures used to report these modifications.
8. OPERATING PROCEDURES
- 8.1. Flight preparation instructions. As applicable to the operation:
- 8.1.1. Minimum flight altitudes. A description of the method of determination and application of minimum altitudes including:
- (a) A procedure to establish the minimum altitudes/flight levels for VFR flights; and
  - (b) A procedure to establish the minimum altitudes/flight levels for IFR flights.
- 8.1.2. Criteria and responsibilities for the authorisation of the use of aerodromes taking into account the applicable requirements of Subparts D, E, F, G, H, I and J.
- 8.1.3. Methods for establishing of aerodrome operating minima. The method for establishing aerodrome operating minima for IFR flights in accordance with OPS 1 Subpart E. Reference must be made to procedures for the determination of the visibility and/or runway visual range and for the applicability of the actual visibility observed by the pilots, the reported visibility and the reported runway visual range.
- 8.1.4. En-route operating minima for VFR Flights or VFR portions of a flight and, where single engined aeroplanes are used, instructions for route selection with respect to the availability of surfaces which permit a safe forced landing.
- 8.1.5. Presentation and application of aerodrome and en-route operating minima
- 8.1.6. Interpretation of meteorological information. Explanatory material on the decoding of MET forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions.
- 8.1.7. Determination of the quantities of fuel, oil and water methanol carried. The methods by which the quantities of fuel, oil and water methanol to be carried are determined and monitored in flight. This section must also include instructions on the measurement and distribution of the fluid carried on board. Such instructions must take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight re-planning and of failure of one or more of the aeroplane's power plants. The system for maintaining fuel and oil records must also be described.
- 8.1.8. Mass and centre of gravity. The general principles of mass and centre of gravity including:
- (a) Definitions;
  - (b) Methods, procedures and responsibilities for preparation and acceptance of mass and centre of gravity calculations;
  - (c) The policy for using either standard and/or actual masses;
  - (d) The method for determining the applicable passenger, baggage and cargo mass;
  - (e) The applicable passenger and baggage masses for various types of operations and aeroplane type;

- (f) General instruction and information necessary for verification of the various types of mass and balance documentation in use;
  - (g) Last minute changes procedures;
  - (h) Specific gravity of fuel, oil and water methanol; and
  - (i) Seating policy/procedures.
- 8.1.9. ATS flight plan. Procedures and responsibilities for the preparation and submission of the air traffic services flight plan. Factors to be considered include the means of submission for both individual and repetitive flight plans.
- 8.1.10. Operational flight plan. Procedures and responsibilities for the preparation and acceptance of the operational flight plan. The use of the operational flight plan must be described including samples of the operational flight plan formats in use.
- 8.1.11. Operator's aeroplane technical log. The responsibilities and the use of the operator's aeroplane technical log must be described, including samples of the format used.
- 8.1.12. List of documents, forms and additional information to be carried.
- 8.2. Ground handling instructions
- 8.2.1. Fuelling procedures. A description of fuelling procedures, including:
- (a) safety precautions during refuelling and defuelling including when an APU is in operation or when a turbine engine is running and the prop-brakes are on;
  - (b) refuelling and defuelling when passengers are embarking, on board or disembarking; and
  - (c) precautions to be taken to avoid mixing fuels.
- 8.2.2. Aeroplane, passengers and cargo handling procedures related to safety. A description of the handling procedures to be used when allocating seats and embarking and disembarking passengers and when loading and unloading the aeroplane. Further procedures, aimed at achieving safety whilst the aeroplane is on the ramp, must also be given. Handling procedures must include:
- (a) children/infants, sick passengers and persons with reduced mobility;
  - (b) transportation of inadmissible passengers, deportees or persons in custody;
  - (c) permissible size and weight of hand baggage;
  - (d) loading and securing of items in the aeroplane;
  - (e) special loads and classification of load compartments;
  - (f) positioning of ground equipment;
  - (g) operation of aeroplane doors;
  - (h) safety on the ramp, including fire prevention, blast and suction areas;
  - (i) start-up, ramp departure and arrival procedures including push-back and towing operations;
  - (j) servicing of aeroplanes;
  - (k) documents and forms for aeroplane handling; and
  - (l) multiple occupancy of aeroplane seats.

- 8.2.3. Procedures for the refusal of embarkation. Procedures to ensure that persons who appear to be intoxicated or who demonstrate by manner or physical indications that they are under the influence of drugs, except medical patients under proper care, are refused embarkation. This does not apply to medical patients under proper care.
- 8.2.4. De-icing and anti-icing on the ground. A description of the de-icing and anti-icing policy and procedures for aeroplanes on the ground. These shall include descriptions of the types and effects of icing and other contaminants on aeroplanes whilst stationary, during ground movements and during take-off. In addition, a description of the fluid types used must be given including:
- (a) proprietary or commercial names;
  - (b) characteristics;
  - (c) effects on aeroplane performance;
  - (d) hold-over times; and
  - (e) precautions during usage.
- 8.3. Flight procedures
- 8.3.1. VFR/IFR policy. A description of the policy for allowing flights to be made under VFR, or of requiring flights to be made under IFR, or of changing from one to the other.
- 8.3.2. Navigation procedures. A description of all navigation procedures relevant to the type(s) and area(s) of operation. Consideration must be given to:
- (a) standard navigational procedures including policy for carrying out independent cross-checks of keyboard entries where these affect the flight path to be followed by the aeroplane;
  - (b) MNPS and POLAR navigation and navigation in other designated areas;
  - (c) RNAV;
  - (d) in-flight re-planning;
  - (e) procedures in the event of system degradation; and
  - (f) RVSM.
- 8.3.3. Altimeter setting procedures including use, where appropriate, of
- metric altimetry and conversion tables,
  - and
  - QFE operating procedures.
- 8.3.4. Altitude alerting system procedures
- 8.3.5. Ground proximity warning system/terrain avoidance warning system. Procedures and instructions required for the avoidance of controlled flight into terrain, including limitations on high rate of descent near the surface (the related training requirements are covered in D.2.1).
- 8.3.6. Policy and procedures for the use of TCAS/ACAS
- 8.3.7. Policy and procedures for in-flight fuel management

- 8.3.8. Adverse and potentially hazardous atmospheric conditions. Procedures for operating in, and/or avoiding adverse and potentially hazardous atmospheric conditions including:
- (a) thunderstorms;
  - (b) icing conditions;
  - (c) turbulence;
  - (d) wind shear;
  - (e) jet stream;
  - (f) volcanic ash clouds;
  - (g) heavy precipitation;
  - (h) sand storms;
  - (i) mountain waves; and
  - (j) significant temperature inversions.
- 8.3.9. Wake turbulence. Wake turbulence separation criteria, taking into account aeroplane types, wind conditions and runway location.
- 8.3.10. Crew members at their stations. The requirements for crew members to occupy their assigned stations or seats during the different phases of flight or whenever deemed necessary in the interest of safety and also include procedures for controlled rest on the flight deck.
- 8.3.11. Use of safety belts for crew and passengers. The requirements for crew members and passengers to use safety belts and/or harnesses during the different phases of flight or whenever deemed necessary in the interest of safety.
- 8.3.12. Admission to flight deck. The conditions for the admission to the flight deck of persons other than the flight crew. The policy regarding the admission of inspectors from the Authority must also be included.
- 8.3.13. Use of vacant crew seats. The conditions and procedures for the use of vacant crew seats.
- 8.3.14. Incapacitation of crew members. Procedures to be followed in the event of incapacitation of crew members in flight. Examples of the types of incapacitation and the means for recognising them must be included.
- 8.3.15. Cabin safety requirements. Procedures covering:
- (a) cabin preparation for flight, in-flight requirements and preparation for landing including procedures for securing cabin and galleys;
  - (b) procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the aeroplane;
  - (c) procedures to be followed during passenger embarkation and disembarkation;
  - (d) procedures when refuelling/defuelling with passengers embarking, on board or disembarking; and
  - (e) smoking on board.
- 8.3.16. Passenger briefing procedures. The contents, means and timing of passenger briefing in accordance with OPS 1.285.
- 8.3.17. Procedures for aeroplanes operated whenever required cosmic or solar radiation detection equipment is carried. Procedures for the use of cosmic or solar radiation detection equipment and for recording its readings including actions to be taken in the event that limit values specified in the Operations Manual are exceeded. In addition, the procedures, including ATS procedures, to be followed in the event that a decision to descend or re-route is taken.

- 8.3.18. Policy on the use of autopilot and auto throttle.
- 8.4. All weather operations. A description of the operational procedures associated with all weather operations (see also OPS Subpart D and E).
- 8.5. ETOPS. A description of the ETOPS operational procedures.
- 8.6. Use of the minimum equipment and configuration deviation list(s)
- 8.7. Non revenue flights. Procedures and limitations for:
- (a) training flights;
  - (b) test flights;
  - (c) delivery flights;
  - (d) ferry flights;
  - (e) demonstration flights; and
  - (f) positioning flights, including the kind of persons who may be carried on such flights.
- 8.8. Oxygen requirements
- 8.8.1. An explanation of the conditions under which oxygen must be provided and used.
- 8.8.2. The oxygen requirements specified for:
- (a) flight crew;
  - (b) cabin crew; and
  - (c) passengers.
9. DANGEROUS GOODS AND WEAPONS
- 9.1. Information, instructions and general guidance on the transport of dangerous goods including:
- (a) operator's policy on the transport of dangerous goods;
  - (b) guidance on the requirements for acceptance, labelling, handling, stowage and segregation of dangerous goods;
  - (c) special notification requirements in the event of an accident or occurrence when dangerous goods are being carried;
  - (d) procedures for responding to emergency situations involving dangerous goods;
  - (e) duties of all personnel involved as per OPS 1.1215; and
  - (f) instructions on the carriage of the operator's employees.
- 9.2. The conditions under which weapons, munitions of war and sporting weapons may be carried.
10. SECURITY
- 10.1. Security instructions and guidance of a non-confidential nature which must include the authority and responsibilities of operations personnel. Policies and procedures for handling and reporting crime on board such as unlawful interference, sabotage, bomb threats, and hijacking must also be included.
- 10.2. A description of preventative security measures and training.

Note: Parts of the security instructions and guidance may be kept confidential.

## 11. HANDLING, NOTIFYING AND REPORTING OCCURENCES

Procedures for the handling, notifying and reporting occurrences. This section must include:

- (a) definitions occurrences and of the relevant responsibilities of all persons involved;
- (b) illustrations of forms used for reporting all types of occurrences (or copies of the forms themselves), instructions on how they are to be completed, the addresses to which they should be sent and the time allowed for this to be done;
- (c) in the event of an accident, descriptions of which company departments, Authorities and other organisations that have to be notified, how this will be done and in what sequence;
- (d) procedures for verbal notification to air traffic service units of incidents involving ACAS RAs, bird hazards and hazardous conditions;
- (e) procedures for submitting written reports on air traffic incidents, ACAS RAs, bird strikes, dangerous goods incidents or accidents, and unlawful interference;
- (f) reporting procedures to ensure compliance with OPS 1.085(b) and 1.420. These procedures must include internal safety related reporting procedures to be followed by crew members, designed to ensure that the commander is informed immediately of any incident that has endangered, or may have endangered, safety during flight and that he/she is provided with all relevant information.

## 12. RULES OF THE AIR

Rules of the Air including:

- (a) visual and instrument flight rules;
- (b) territorial application of the Rules of the Air;
- (c) communication procedures including COM-failure procedures;
- (d) information and instructions relating to the interception of civil aeroplanes;
- (e) the circumstances in which a radio listening watch is to be maintained;
- (f) signals;
- (g) time system used in operation;
- (h) ATC clearances, adherence to flight plan and position reports;
- (i) visual signals used to warn an unauthorised aeroplane flying in or about to enter a restricted, prohibited or danger area;
- (j) procedures for pilots observing an accident or receiving a distress transmission;
- (k) the ground/air visual codes for use by survivors, description and use of signal aids; and
- (l) distress and urgency signals.

## 13. LEASING

A description of the operational arrangements for leasing, associated procedures and management responsibilities.

**B. AEROPLANE OPERATING MATTERS — TYPE RELATED**

Taking account of the differences between types, and variants of types, under the following headings:

**0. GENERAL INFORMATION AND UNITS OF MEASUREMENT**

- 0.1. General information (e.g. aeroplane dimensions), including a description of the units of measurement used for the operation of the aeroplane type concerned and conversion tables.

**1. LIMITATIONS**

- 1.1. A description of the certified limitations and the applicable operational limitations including:

- (a) certification status (e.g. CS-23, CS-25, ICAO Annex 16 (CS-36 and CS-34), etc.);
- (b) passenger seating configuration for each aeroplane type including a pictorial presentation;
- (c) types of operation that are approved (e.g. VFR/IFR, CAT II/III, RNP Type, flight in known icing conditions, etc.);
- (d) crew composition;
- (e) mass and centre of gravity;
- (f) speed limitations;
- (g) flight envelope(s);
- (h) wind limits including operations on contaminated runways;
- (i) performance limitations for applicable configurations;
- (j) runway slope;
- (k) limitations on wet or contaminated runways;
- (l) airframe contamination; and
- (m) system limitations.

**2. NORMAL PROCEDURES**

- 2.1. The normal procedures and duties assigned to the crew, the appropriate check-lists, the system for use of the check-lists and a statement covering the necessary coordination procedures between flight and cabin crew. The following normal procedures and duties must be included:

- (a) pre-flight;
- (b) pre-departure;
- (c) altimeter setting and checking;
- (d) taxi, take-off and climb;
- (e) noise abatement;
- (f) cruise and descent;
- (g) approach, landing preparation and briefing;
- (h) VFR approach;
- (i) instrument approach;
- (j) visual approach and circling;



- (k) missed approach;
- (l) normal landing;
- (m) post landing; and
- (n) operation on wet and contaminated runways.

### 3. ABNORMAL AND EMERGENCY PROCEDURES

3.1. The abnormal and emergency procedures and duties assigned to the crew, the appropriate check-lists, the system for use of the check-lists and a statement covering the necessary coordination procedures between flight and cabin crew. The following abnormal and emergency procedures and duties must be included:

- (a) crew incapacitation;
- (b) fire and smoke drills;
- (c) unpressurised and partially pressurised flight;
- (d) exceeding structural limits such as overweight landing;
- (e) exceeding cosmic radiation limits;
- (f) lightning strikes;
- (g) distress communications and alerting ATC to emergencies;
- (h) engine failure;
- (i) system failures;
- (j) guidance for diversion in case of serious technical failure;
- (k) ground proximity warning;
- (l) TCAS warning;
- (m) wind shear; and
- (n) emergency landing/ditching; and
- (o) departure contingency procedures.

### 4. PERFORMANCE

4.0. Performance data must be provided in a form in which it can be used without difficulty.

4.1. Performance data. Performance material which provides the necessary data for compliance with the performance requirements prescribed in OPS 1 Subparts F, G, H and I must be included to allow the determination of:

- (a) take-off climb limits — mass, altitude, temperature;
- (b) take-off field length (dry, wet, contaminated);
- (c) net flight path data for obstacle clearance calculation or, where applicable, take-off flight path;
- (d) the gradient losses for banked climb outs;
- (e) en-route climb limits;
- (f) approach climb limits;

- (g) landing climb limits;
  - (h) landing field length (dry, wet, contaminated) including the effects of an in-flight failure of a system or device, if it affects the landing distance;
  - (i) brake energy limits; and
  - (j) speeds applicable for the various flight stages (also considering wet or contaminated runways).
- 4.1.1. Supplementary data covering flights in icing conditions. Any certificated performance related to an allowable configuration, or configuration deviation, such as anti-skid inoperative, must be included.
- 4.1.2. If performance data, as required for the appropriate performance class, is not available in the approved AFM, then other data acceptable to the Authority must be included. Alternatively, the Operations Manual may contain cross-reference to the approved data contained in the AFM where such data is not likely to be used often or in an emergency.
- 4.2. Additional performance data. Additional performance data where applicable including:
  - (a) all engine climb gradients;
  - (b) drift-down data;
  - (c) effect of de-icing/anti-icing fluids;
  - (d) flight with landing gear down;
  - (e) for aeroplanes with three or more engines, one engine inoperative ferry flights; and
  - (f) flights conducted under the provisions of the CDL.
- 5. FLIGHT PLANNING
- 5.1. Data and instructions necessary for pre-flight and in-flight planning including factors such as speed schedules and power settings. Where applicable, procedures for engine(s)-out operations, ETOPS (particularly the one-engine-inoperative cruise speed and maximum distance to an adequate aerodrome determined in accordance with OPS 1.245) and flights to isolated aerodromes must be included.
- 5.2. The method for calculating fuel needed for the various stages of flight, in accordance with OPS 1.255.
- 5.3. Performance Data for ETOPS Critical Fuel Reserve and Area of Operation including sufficient data to support the critical fuel reserve and area of operation calculation based on Approved Aeroplane Performance Data. The following data is required:
  - (a) Detailed engine(s) inoperative performance data including fuel flow for standard and non-standard atmospheric conditions and as a function of airspeed and power setting, where appropriate, covering:
    - (i) drift down (includes net performance) see OPS 1.505 where applicable;
    - (ii) cruise altitude coverage including 10 000 feet;
    - (iii) holding;
    - (iv) altitude capability (includes net performance); and
    - (v) missed approach.
  - (b) Detailed all-engine-operating performance data, including nominal fuel flow data, for standard and non-standard atmospheric conditions and as a function of airspeed and power setting, where appropriate, covering:
    - (i) cruise (altitude coverage including 10 000 feet); and
    - (ii) holding.

- (c) Details of any other conditions relevant to ETOPS operations which can cause significant deterioration of performance, such as ice accumulation on the unprotected surfaces of the aeroplane, ram air turbine (RAT) deployment, thrust-reverser deployment, etc.

The altitudes, airspeeds, thrust settings, and fuel flow used in establishing the ETOPS area of operations for each airframe-engine combination must be used in showing the corresponding terrain and obstruction clearances in accordance with this regulation.

## 6. MASS AND BALANCE

Instructions and data for the calculation of the mass and balance including:

- (a) calculation system (e.g. index system);
- (b) information and instructions for completion of mass and balance documentation, including manual and computer generated types;
- (c) limiting masses and centre of gravity for the types, variants or individual aeroplanes used by the operator; and
- (d) dry operating mass and corresponding centre of gravity or index.

## 7. LOADING

Procedures and provisions for loading and securing the load in the aeroplane.

## 8. CONFIGURATION DEVIATION LIST

The configuration deviation list(s) (CDL), if provided by the manufacturer, taking account of the aeroplane types and variants operated including procedures to be followed when an aeroplane is being despatched under the terms of its CDL.

## 9. MINIMUM EQUIPMENT LIST

The minimum equipment list (MEL) taking account of the aeroplane types and variants operated and the type(s)/area(s) of operation. The MEL must include the navigational equipment and take into account the required performance for the route and area of operation.

## 10. SURVIVAL AND EMERGENCY EQUIPMENT INCLUDING OXYGEN

- 10.1. A list of the survival equipment to be carried for the routes to be flown and the procedures for checking the serviceability of this equipment prior to take-off. Instructions regarding the location, accessibility and use of survival and emergency equipment and its associated check list(s) must also be included.
- 10.2. The procedure for determining the amount of oxygen required and the quantity that is available. The flight profile, number of occupants and possible cabin decompression must be considered. The information provided must be in a form in which it can be used without difficulty.

## 11. EMERGENCY EVACUATION PROCEDURES

- 11.1. Instructions for preparation for emergency evacuation including crew co-ordination and emergency station assignment.
- 11.2. Emergency evacuation procedures. A description of the duties of all members of the crew for the rapid evacuation of an aeroplane and the handling of the passengers in the event of a forced landing, ditching or other emergency.

## 12. AEROPLANE SYSTEMS

A description of the aeroplane systems, related controls and indications and operating instructions.

**C. ROUTE AND AERODROME INSTRUCTIONS AND INFORMATION**

1. Instructions and information relating to communications, navigation and aerodromes including minimum flight levels and altitudes for each route to be flown and operating minima for each aerodrome planned to be used, including:
  - (a) minimum flight level/altitude;
  - (b) operating minima for departure, destination and alternate aerodromes;
  - (c) communication facilities and navigation aids;
  - (d) runway data and aerodrome facilities;
  - (e) approach, missed approach and departure procedures including noise abatement procedures;
  - (f) COM-failure procedures;
  - (g) search and rescue facilities in the area over which the aeroplane is to be flown;
  - (h) a description of the aeronautical charts that must be carried on board in relation to the type of flight and the route to be flown, including the method to check their validity;
  - (i) availability of aeronautical information and MET services;
  - (j) en-route COM/NAV procedures;
  - (k) aerodrome categorisation for flight crew competence qualification;
  - (l) special aerodrome limitations (performance limitations and operating procedures).

**D. TRAINING**

1. Training syllabi and checking programmes for all operations personnel assigned to operational duties in connection with the preparation and/or conduct of a flight.
  2. Training syllabi and checking programmes must include:
    - 2.1. for flight crew. All relevant items prescribed in Subpart E and N;
    - 2.2. for cabin crew. All relevant items prescribed in Subpart O;
    - 2.3. for operations personnel concerned, including crew members:
      - (a) all relevant items prescribed in Subpart R (transport of dangerous goods by air); and
      - (b) all relevant items prescribed in Subpart S (security).
    - 2.4. for operations personnel other than crew members (e.g. dispatcher, handling personnel, etc.). All other relevant items prescribed in OPS pertaining to their duties.
  3. Procedures
    - 3.1. Procedures for training and checking.
    - 3.2. Procedures to be applied in the event that personnel do not achieve or maintain the required standards.
    - 3.3. Procedures to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means are not simulated during commercial air transportation flights.
  4. Description of documentation to be stored and storage periods (see Appendix 1 to OPS 1.1065).
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## Appendix 1 to OPS 1.1065

**Document storage periods**

An operator shall ensure that the following information/documentation is stored in an acceptable form, accessible to the Authority, for the periods shown in the Tables below.

*Note:* Additional information relating to maintenance records is prescribed in Part-M, paragraph M.A.306(c) operator's technical log system.

Table 1

**Information used for the preparation and execution of a flight**

Information used for the preparation and execution of the flight as described in OPS 1.135	
Operational flight plan	Three months
Aeroplane technical log	36 months after the date of the last entry, in accordance with Part M M.A.306(c)
Route specific NOTAM/AIS briefing documentation if edited by the operator	Three months
Mass and balance documentation	Three months
Notification of special loads including written information to the commander about dangerous goods	Three months

Table 2

**Reports**

Reports	
Journey log	Three months
Flight report(s) for recording details of any occurrence, as prescribed in OPS 1.420, or any event which the commander deems necessary to report/record	Three months
Reports on exceedances of duty and/or reducing rest periods	Three months

Table 3

**Flight crew records**

Flight crew records	
Flight, duty and rest time	15 months
Licence	As long as the flight crew member is exercising the privileges of the licence for the operator
Conversion training and checking	Three years
Command course (including checking)	Three years
Recurrent training and checking	Three years
Training and checking to operate in either pilot's seat	Three years
Recent experience (OPS 1.970 refers)	15 months
Route and aerodrome competence (OPS1.975 refers)	Three years
Training and qualification for specific operations when required by OPS (e.g. ETOPS CATII/III operations)	Three years
Dangerous goods training as appropriate	Three years

Table 4

**Cabin crew records**

Cabin crew records	
Flight, duty and rest time	15 months
Initial training, conversion and differences training (including checking)	As long as the cabin crew member is employed by the operator
Recurrent training and refresher (including checking)	Until 12 months after the cabin crew member has left the employ of the operator
Dangerous goods training as appropriate	Three years

Table 5

**Records for other operations personnel**

Records for other operations personnel	
Training/qualification records of other personnel for whom an approved training programme is required by OPS	Last two training records

Table 6

**Other records**

Other records	
Records on cosmic and solar radiation dosage	Until 12 months after the crew member has left the employ of the operator
Quality system records	Five years
Dangerous goods transport document	Three months after completion of the flight
Dangerous goods acceptance checklist	Three months after completion of the flight

## SUBPART Q

*FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS*

## OPS 1.1090

**Objective and scope**

1. An operator shall establish a flight and duty time limitations and rest scheme (FTL) for crew members.
2. An operator shall ensure that for all its flights:
  - 2.1. The flight and duty time limitations and rest scheme is in accordance with both:
    - (a) the provisions of this Subpart; and
    - (b) any additional provisions that are applied by the Authority in accordance with the provisions of this Subpart for the purpose of maintaining safety.
  - 2.2. Flights are planned to be completed within the allowable flight duty period taking into account the time necessary for pre-flight duties, the flight and turn-around times.
  - 2.3. Duty rosters will be prepared and published sufficiently in advance to provide the opportunity for crew members to plan adequate rest.
3. Operators' responsibilities
  - 3.1. An operator shall nominate a home base for each crew member.
  - 3.2. Operators shall be expected to appreciate the relationship between the frequencies and pattern of flight duty periods and rest periods and give due consideration to the cumulative effects of undertaking long duty hours interspersed with minimum rest.
  - 3.3. Operators shall allocate duty patterns which avoid such undesirable practices as alternating day/night duties or the positioning of crew members so that a serious disruption of established sleep/work pattern occurs.
  - 3.4. Operators shall plan local days free of duty and notify crew members in advance.
  - 3.5. Operators shall ensure that rest periods provide sufficient time to enable crew to overcome the effects of the previous duties and to be well rested by the start of the following flight duty period.
  - 3.6. Operators shall ensure flight duty periods are planned to enable crew members to remain sufficiently free from fatigue so they can operate to a satisfactory level of safety under all circumstances.
4. Crew members' responsibilities
  - 4.1. A crew member shall not operate an aeroplane if he/she knows that he/she is suffering from or is likely to suffer from fatigue or feels unfit, to the extent that the flight may be endangered.
  - 4.2. Crew members should make optimum use of the opportunities and facilities for rest provided and plan and use their rest periods properly.
5. Responsibilities of Civil Aviation Authorities
  - 5.1. Variations
    - 5.1.1. Subject to the provisions of Article 8, the Authority may grant variations to the requirements in this Subpart in accordance with applicable laws and procedures within the Member States concerned and in consultation with interested parties.

- 5.1.2. Each operator will have to demonstrate to the Authority, using operational experience and taking into account other relevant factors such as current scientific knowledge, that its request for a variation produces an equivalent level of safety.

Such variations will be accompanied with suitable mitigation measures where appropriate.

OPS 1.1095

### Definitions

For the purposes of this Regulation, the following definitions shall apply:

- 1.1. Augmented flight crew:

A flight crew which comprises more than the minimum number required for the operation of the aeroplane and in which each flight crew member can leave his/her post and be replaced by another appropriately qualified flight crew member.

- 1.2. Block time:

The time between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped.

- 1.3. Break:

A period free of all duties, which counts as duty, being less than a rest period.

- 1.4. Duty:

Any task that a crew member is required to carry out associated with the business of an AOC holder. Unless where specific rules are provided for by this Regulation, the Authority shall define whether and to what extent standby is to be accounted for as duty.

- 1.5. Duty period:

A period which starts when a crew member is required by an operator to commence a duty and ends when the crew member is free from all duties.

- 1.6. Flight duty period:

A flight duty period (FDP) is any time during which a person operates in an aircraft as a member of its crew. The FDP starts when the crew member is required by an operator to report for a flight or a series of flights; it finishes at the end of the last flight on which he/she is an operating crew member.

- 1.7. Home base:

The location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal conditions, the operator is not responsible for the accommodation of the crew member concerned.

- 1.8. Local day:

A 24 hour period commencing at 00.00 local time.

- 1.9. Local night:

A period of eight hours falling between 22.00 and 08.00 local time.

- 1.10. A single day free of duty:

A single day free of duty shall include two local nights. A rest period may be included as part of the day off.



**1.11. Operating crew member:**

A crew member who carries out his/her duties in an aircraft during a flight or during any part of a flight.

**1.12 Positioning:**

The transferring of a non-operating crew member from place to place, at the behest of the operator, excluding travelling time. Travelling time is defined as:

- time from home to a designated reporting place and vice versa,
- time for local transfer from a place of rest to the commencement of duty and vice versa.

**1.13. Rest period:**

An uninterrupted and defined period of time during which a crew member is free from all duties and airport standby.

**1.14. Standby:**

A defined period of time during which a crew member is required by the operator to be available to receive an assignment for a flight, positioning or other duty without an intervening rest period.

**1.15. Window of Circadian Low (WOCL):**

The Window of Circadian Low (WOCL) is the period between 02.00 and 05.59. Within a band of three time zones the WOCL refers to home base time. Beyond these three time zones the WOCL refers to home base time for the first 48 hours after departure from home base time zone, and to local time thereafter.

**OPS 1.1100****Flight and duty limitations****1.1. Cumulative duty hours**

An operator shall ensure that the total duty periods to which a crew member is assigned do not exceed:

- (a) 190 duty hours in any 28 consecutive days, spread as evenly as practicable throughout this period; and
- (b) 60 duty hours in any seven consecutive days.

**1.2. Limit on total block times**

An operator shall ensure that the total block times of the flights on which an individual crew member is assigned as an operating crew member does not exceed

- (a) 900 block hours in a calendar year;
- (b) 100 block hours in any 28 consecutive days.

**OPS 1.1105****Maximum daily flight duty period (FDP)**

1.1. This OPS does not apply to single pilot operations and to emergency medical service operations.

1.2. An operator shall specify reporting times that realistically reflect the time for safety related ground duties as approved by the Authority.

- 1.3. The maximum basic daily FDP is 13 hours.
- 1.4. These 13 hours will be reduced by 30 minutes for each sector from the third sector onwards with a maximum total reduction of two hours.
- 1.5. When the FDP starts in the WOCL, the maximum stated in point 1.3 and point 1.4 will be reduced by 100 % of its encroachment up to a maximum of two hours. When the FDP ends in or fully encompasses the WOCL, the maximum FDP stated in point 1.3 and point 1.4 will be reduced by 50 % of its encroachment.
2. Extensions:
  - 2.1. The maximum daily FDP can be extended by up to one hour.
  - 2.2. Extensions are not allowed for a basic FDP of six sectors or more.
  - 2.3. Where an FDP encroaches on the WOCL by up to two hours extensions are limited to up to four sectors.
  - 2.4. Where an FDP encroaches on the WOCL by more than two hours extensions are limited to up to two sectors.
  - 2.5. The maximum number of extensions is two in any seven consecutive days.
  - 2.6. Where an FDP is planned to use an extension pre and post flight minimum rest is increased by two hours or post flight rest only is increased by four hours. Where the extensions are used for consecutive FDPs the pre and post rest between the two operations shall run consecutively.
  - 2.7. When an FDP with extension starts in the period 22.00 to 04.59 the operator will limit the FDP to 11.45.
3. Cabin Crew
  - 3.1. For cabin crew being assigned to a flight or series of flights, the FDP of the cabin crew may be extended by the difference in reporting time between cabin crew and flight crew, as long as the difference does not exceed one hour.
4. Operational Robustness
  - 4.1. Planned schedules must allow for flights to be completed within the maximum permitted flight duty period. To assist in achieving this operators will take action to change a schedule or crewing arrangements at the latest where the actual operation exceeds the maximum FDP on more than 33 % of the flights in that schedule during a scheduled seasonal period.
5. Positioning
  - 5.1. All the time spent on positioning is counted as duty.
  - 5.2. Positioning after reporting but prior to operating shall be included as part of the FDP but shall not count as a sector.
  - 5.3. A positioning sector immediately following operating sector will be taken into account for the calculation of minimum rest as defined in OPS 1.1110 points 1.1 and 1.2 below.
6. Extended FDP (split duty)
  - 6.1. The Authority may grant approval to an operation based on an extended FDP including a break, subject to the provisions of Article 8.
  - 6.2. Each operator will have to demonstrate to the Authority, using operational experience and taking into account other relevant factors, such as current scientific knowledge, that its request for an extended FDP produces an equivalent level of safety.

## OPS 1.1110

**Rest**

1. Minimum rest
  - 1.1. The minimum rest which must be provided before undertaking a flight duty period starting at home base shall be at least as long as the preceding duty period or 12 hours whichever is the greater;
  - 1.2. The minimum rest which must be provided before undertaking a flight duty period starting away from home base shall be at least as long as the preceding duty period or 10 hours whichever is the greater; when on minimum rest away from home base, the operator must allow for an eight hour sleep opportunity taking due account of travelling and other physiological needs;
  - 1.3. An operator will ensure that effects on crew members of time zone differences will be compensated by additional rest, as regulated by the Authority subject to the provisions of Article 8.
  - 1.4.1. Notwithstanding 1.1 and 1.2 and subject to the provisions of Article 8, the Authority may grant reduced rest arrangements.
  - 1.4.2. Each operator will have to demonstrate to the Authority, using operational experience and taking into account other relevant factors, such as current scientific knowledge, that its request for reduced rest arrangements produces an equivalent level of safety.
2. Rest periods
  - 2.1. An operator shall ensure that the minimum rest provided as outlined above is increased periodically to a weekly rest period, being a 36-hour period including two local nights, such that there shall never be more than 168 hours between the end of one weekly rest period and the start of the next. As an exception to OPS 1.1095 point 1.9, the Authority may decide that the second of those local nights may start from 20:00 hours if the weekly rest period has a duration of at least 40 hours.

## OPS 1.1115

**Extension of flight duty period due to in-flight rest**

1. Subject to the provisions of Article 8 and providing each operator demonstrates to the Authority, using operational experience and taking into account other relevant factors such as current scientific knowledge, that its request produces an equivalent level of safety:

- 1.1. Flight crew augmentation

The Authority shall set the requirements in connection with the augmentation of a basic flight crew for the purpose of extending the flight duty period beyond the limits in OPS 1.1105 above.

- 1.2. Cabin crew

The Authority shall set the requirements in connection with the minimum in-flight rest by cabin crew member(s) when the FDP goes beyond the limitations in OPS 1.1105 above.

## OPS 1.1120

**Unforeseen circumstances in actual flight operations — commander's discretion**

1. Taking into account the need for careful control of these instances implied underneath, during the actual flight operation, which starts at the reporting time, the limits on flight duty, duty and rest periods prescribed in this Subpart may be modified in the event of unforeseen circumstances. Any such modifications must be acceptable to the commander after consultation with all other crew members and must, in all circumstances, comply with the following:

- 1.1. The maximum FDP referred to in OPS 1.1105 point 1.3 above may not be increased by more than two hours unless the flight crew has been augmented, in which case the maximum flight duty period may be increased by not more than three hours;
  - 1.1.1. If on the final sector within a FDP unforeseen circumstances occur after take off that will result in the permitted increase being exceeded, the flight may continue to the planned destination or alternate;
  - 1.1.2. In the event of such circumstances, the rest period following the FDP may be reduced but never below the minimum rest defined in OPS 1.1110 point 1.2 of this Subpart;
- 1.2. The Commander shall, in case of special circumstances, which could lead to severe fatigue, and after consultation with the crew members affected, reduce the actual flight duty time and/or increase the rest time in order to eliminate any detrimental effect on flight safety;
- 1.3. An operator shall ensure that:
  - 1.3.1. The Commander submits a report to the operator whenever a FDP is increased by his/her discretion or when a rest period is reduced in actual operation and
  - 1.3.2. Where the increase of a FDP or reduction of a rest period exceeds one hour, a copy of the report, to which the operator must add his comments, is sent to the Authority no later than 28 days after the event.

#### OPS 1.1125

##### **Standby**

1. Airport standby
  - 1.1. A crew member is on airport standby from reporting at the normal report point until the end of the notified standby period.
  - 1.2. Airport standby will count in full for the purposes of cumulative duty hours.
  - 1.3. Where airport standby is immediately followed by a flight duty, the relationship between such airport standby and the assigned flight duty shall be defined by the Authority. In such a case, airport standby shall be added to the duty period referred to in OPS 1.1110 under points 1.1 and 1.2 for the purposes of calculating minimum rest.
  - 1.4. Where the airport standby does not lead to assignment on a flight duty, it shall be followed at least by a rest period as regulated by the Authority.
  - 1.5. While on airport standby the operator will provide to the crew member a quiet and comfortable place not open to the public.
2. Other forms of standby (including standby at hotel)
  - 2.1. Subject to the provisions of Article 8, all other forms of standby shall be regulated by the Authority, taking into account the following:
    - 2.1.1. All activity shall be rostered and/or notified in advance.
    - 2.1.2. The start and end time of the standby shall be defined and notified in advance.
    - 2.1.3. The maximum length of any standby at a place other than a specified reporting point shall be determined.
    - 2.1.4. Taking into account facilities available for the crew member to rest and other relevant factors, the relationship between the standby and any assigned flight duty resulting from the standby shall be defined.
    - 2.1.5. The counting of standby times for the purposes of cumulative duty hours shall be defined.

## OPS 1.1130

**Nutrition**

A meal and drink opportunity must occur in order to avoid any detriment to a crew member's performance, especially when the FDP exceeds six hours.

## OPS 1.1135

**Flight duty, duty and rest period records**

1. An operator shall ensure that crew member's records include:
  - (a) block times;
  - (b) start, duration and end of each duty or flight duty periods;
  - (c) rest periods and days free of all duties;and are maintained to ensure compliance with the requirements of this Subpart; copies of these records will be made available to the crew member upon request.
2. If the records held by the operator under paragraph 1 do not cover all of his/her flight duty, duty and rest periods, the crew member concerned shall maintain an individual record of his/her:
  - (a) block times;
  - (b) start, duration and end of each duty or flight duty periods; and
  - (c) rest periods and days free of all duties.
3. A crew member shall present his/her records on request to any operator who employs his/her services before he/she commences a flight duty period.
4. Records shall be preserved for at least 15 calendar months from the date of the last relevant entry or longer if required in accordance with national laws.
5. Additionally, operators shall separately retain all aircraft commander's discretion reports of extended flight duty periods, extended flight hours and reduced rest periods for at least six months after the event.

## SUBPART R

## TRANSPORT OF DANGEROUS GOODS BY AIR

## OPS 1.1145

**General**

An operator must comply with the applicable provisions contained in the Technical Instructions, irrespective of whether:

- (a) the flight is wholly or partly within or wholly outside the territory of a state; or
- (b) an approval to carry dangerous goods in accordance with OPS 1.1155 is held.

## OPS 1.1150

**Terminology**

- (a) Terms used in this Subpart have the following meanings:

1. Acceptance check list. A document used to assist in carrying out a check on the external appearance of packages of dangerous goods and their associated documents to determine that all appropriate requirements have been met.
2. Approval. For the purposes only of compliance with OPS 1.1165(b)2., an authorisation referred to in the Technical Instructions and issued by an Authority, for the transport of dangerous goods which are normally forbidden for transport or for other reasons, as specified in the Technical Instructions;
3. Cargo aircraft. Any aircraft which is carrying goods or property but not passengers. In this context the following are not considered to be passengers:
  - (i) a crew member;
  - (ii) an operator's employee permitted by, and carried in accordance with, the instructions contained in the Operations Manual;
  - (iii) an authorised representative of an Authority; or
  - (iv) a person with duties in respect of a particular shipment on board.
4. 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.
5. Dangerous goods accident. An occurrence associated with and related to the transport of dangerous goods which results in fatal or serious injury to a person or major property damage.
6. Dangerous goods incident. An occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods, not necessarily occurring on board an aircraft, which results in injury to a person, property damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardises the aircraft or its occupants is also deemed to constitute a dangerous goods incident.
7. Dangerous goods transport document. A document which is specified by the Technical Instructions. It is completed by the person who offers dangerous goods for air transport and contains information about those dangerous goods.
8. Exemption. For the purposes only of compliance with this Subpart, an authorisation referred to in the Technical Instructions and issued by all the authorities concerned, providing relief from the requirements of the Technical Instructions.
9. Freight container. A freight container is an article of transport equipment for radioactive materials, designed to facilitate the transport of such materials, either packaged or unpackaged, by one or more modes of transport. (Note: see unit load device where the dangerous goods are not radioactive materials.)

10. Handling agent. An agency which performs on behalf of the operator some or all of the latter's functions including receiving, loading, unloading, transferring or other processing of passengers or cargo.
11. Overpack. An enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage. (Note: a unit load device is not included in this definition.)
12. Package. The complete product of the packing operation consisting of the packaging and its contents prepared for transport.
13. Packaging. Receptacles and any other components or materials necessary for the receptacle to perform its containment function.
14. Serious injury. An injury which is sustained by a person in an accident and which:
  - (i) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; or
  - (ii) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
  - (iii) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or
  - (iv) involves injury to any internal organ; or
  - (v) involves second or third degree burns, or any burns affecting more than 5 % of the body surface; or
  - (vi) involves verified exposure to infectious substances or injurious radiation.
15. Technical Instructions. The latest effective edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air, including the Supplement and any addenda, approved and published by decision of the Council of the International Civil Aviation Organisation (ICAO Doc 9284-AN/905).
16. Unit load device. Any type of aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo. (Note: an overpack is not included in this definition; for a container containing radioactive materials see the definition for freight container.)

#### OPS 1.1155

#### **Approval to transport dangerous goods**

- (a) An operator shall not transport dangerous goods unless approved to do so by the Authority.
- (b) Before the issue of an approval for the transport of dangerous goods, the operator shall satisfy the Authority that adequate training has been given, that all relevant documents (e.g. for ground handling, aeroplane handling, training) contain information and instructions on dangerous goods, and that there are procedures in place to ensure the safe handling of dangerous goods at all stages of air transport.

*Note:* The exemption or approval indicated in OPS 1.1165(b)1. or 2. is in addition to the above and the conditions in (b) may not necessarily apply.

#### OPS 1.1160

#### **Scope**

Articles and substances which would otherwise be classed as dangerous goods but which are not subject to the Technical Instructions in accordance with Part 1 and 8 of those instructions are excluded from the provisions of this Subpart providing that:

- (a) when placed on board with the approval of the operator to provide, during flight, medical aid to the patient, they are:
  1. carried for use in flight; or are part of the permanent equipment of the aeroplane when it has been adapted for specialised use for medical evacuation; or carried on a flight made by the same aeroplane to collect a patient of after that patient has been delivered when it is impracticable to load or unload the goods at the time of the flight on which the patient is carried but with the intention that they be off-loaded as soon as practicable; and

2. when placed on board with the approval of the operator to provide, during flight, medical aid to a patient the dangerous goods shall be restricted to the following and which must be kept in the position in which they are used or stowed securely when not in use and they are secured properly during take off and landing and at all other times when deemed necessary by the commander in the interest of safety:
  - (i) gas cylinders which must have been manufactured specifically for the purpose of containing and transporting that particular gas;
  - (ii) medications and other medical matter which must be under the control of trained personnel during the time when they are in use in the aeroplane;
  - (iii) equipment containing wet cell batteries which must be kept and, when necessary secured, in an upright position to prevent spillage of the electrolyte;
- (b) they are required to be aboard the aeroplane and are in accordance with the relevant requirements or for operating reasons, although articles and substances intended as replacements or which have been removed for replacement must be transported on an aeroplane as specified in the Technical Instructions;
- (c) they are in baggage:
  1. carried by passengers or crew members in accordance with the Technical Instructions; or
  2. which has been separated from its owner during transit (e.g.: lost baggage or improperly routed baggage) but which is carried by the operator.

OPS 1.1165

**Limitations on the transport of dangerous goods**

- (a) An operator shall ensure that articles and substances or other goods declared as dangerous goods that are specifically identified by name or generally described in the Technical Instructions as being forbidden for transport under any circumstances are not carried on any aeroplane.
- (b) An operator shall not carry articles and substances or other goods declared as dangerous goods that are identified in the Technical Instructions as being forbidden for transport in normal circumstances unless the following requirements of those Instructions have been met:
  1. The necessary exemptions have been granted by all the States concerned under the requirements of the Technical Instructions; or
  2. an approval has been granted by all the State(s) concerned on those occasions when the Technical Instructions indicate that only such approval is required.

OPS 1.1190

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OPS 1.1195

**Acceptance of dangerous goods**

- (a) An operator shall not accept dangerous goods unless:
    1. the package, overpack or freight container has been inspected in accordance with the acceptance procedures in the Technical Instructions;
    2. except when otherwise specified in the Technical Instructions, they are accompanied by two copies of a dangerous goods transport document.
    3. the English language is used for:
      - (i) package marking and labelling;
      - and
      - (ii) the dangerous goods transport document,
- in addition to any other language requirements.



- (b) An operator shall use an acceptance check list which shall allow for all relevant details to be checked and shall be in such form as will allow for the recording of the results of the acceptance check by manual, mechanical or computerised means.

*OPS 1.1200*

**Inspection for damage, leakage or contamination**

- (a) An operator shall ensure that:
1. Packages, overpacks and freight containers are inspected for evidence of leakage or damage immediately prior to loading on an aeroplane or into a unit load device, as specified in the Technical Instructions;
  2. A unit load device is not loaded on an aeroplane unless it has been inspected as required by the Technical Instructions and found free from any evidence of leakage from, or damage to, the dangerous goods contained therein;
  3. Leaking or damaged packages, overpacks or freight containers are not loaded on an aeroplane;
  4. Any package of dangerous goods found on an aeroplane and which appears to be damaged or leaking is removed or arrangements made for its removal by an appropriate authority or organisation. In this case the remainder of the consignment shall be inspected to ensure it is in a proper condition for transport and that no damage or contamination has occurred to the aeroplane or its load; and
  5. Packages, overpacks and freight containers are inspected for signs of damage or leakage upon unloading from an aeroplane or from a unit load device and, if there is evidence of damage or leakage, the area where the dangerous goods were stowed is inspected for damage or contamination.

*OPS 1.1205*

**Removal of contamination**

- (a) An operator shall ensure that:
1. any contamination resulting from the leakage from or damage to articles or packages containing dangerous goods is removed without delay and steps are taken to nullify any hazard as specified in the Technical Instructions; and
  2. an aeroplane which has been contaminated by radioactive materials is immediately taken out of service and not returned until the radiation level at any accessible surface and the non-fixed contamination are not more than the values specified in the Technical Instructions.
- (b) In the event of non compliance with any limit in the Technical Instructions applicable to radiation level or contamination,
1. the operator must:
    - (i) ensure the shipper is informed if the non-compliance is identified during transport;
    - (ii) take immediate steps to mitigate the consequences of the non-compliance;
    - (iii) communicate the non-compliance to the shipper and relevant competent Authority(ies), respectively, as soon as practicable and immediately whenever an emergency situation has developed or is developing;
  2. the operator must also, within the scope of his responsibilities:
    - (i) investigate the non-compliance and its causes, circumstances and consequences;

- (ii) take appropriate action, to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance;
- (iii) communicate to the relevant competent Authority(ies) on the causes of the non-compliance and on corrective or preventative actions taken or to be taken.

OPS 1.1210

**Loading restrictions**

- (a) Passenger cabin and flight deck. An operator shall ensure that dangerous goods are not carried in an aeroplane cabin occupied by passengers or on the flight deck, except as specified in the Technical Instructions.
- (b) Cargo compartments. An operator shall ensure that dangerous goods are loaded, segregated, stowed and secured on an aeroplane as specified in the Technical Instructions.
- (c) Dangerous goods designated for carriage only on cargo aircraft. An operator shall ensure that packages of dangerous goods bearing the "Cargo Aircraft Only" label are carried on a cargo aircraft and loaded as specified in the Technical Instructions.

OPS 1.1215

**Provision of information**

- (a) Information to personnel. An operator must provide such information in the operations manual and/or other appropriate manuals as will enable personnel to carry out their responsibilities with regard to the transport of dangerous goods as specified in the Technical Instructions, including the actions to be taken in the event of emergencies involving dangerous goods. Where applicable, such information must also be provided to his handling agent.
- (b) Information to passengers and other persons.
  - 1. An operator shall ensure that information is promulgated as required by the Technical Instructions so that passengers are warned as to the types of goods which they are forbidden from transporting aboard an aeroplane; and
  - 2. An operator shall ensure that notices are provided at acceptance points for cargo giving information about the transport of dangerous goods.
- (c) Information to the commander. An operator shall ensure that:
  - 1. written information is provided to the commander about the dangerous goods to be carried on an aeroplane, as specified in the Technical Instructions;
  - 2. information for use in responding to in-flight emergencies is provided, as specified in the Technical Instructions;
  - 3. a legible copy of the written information to the commander is retained on the ground at a readily accessible location until after the flight to which the written information refers. This copy, or the information contained in it, must be readily accessible to the aerodromes of last departure and next scheduled arrival point, until after the flight to which the information refers;
  - 4. when dangerous goods are carried on a flight which takes place wholly or partially outside the territory of a State, the English language is used for the written information to the commander in addition to any other language requirements.

(See Table 1 of Appendix 1 to OPS 1.1065 for the document storage period.)

- (d) Information in the event of an aeroplane incident or accident.
  - 1. The operator of an aeroplane which is involved in an aeroplane incident shall, on request, provide any information as required by the Technical Instructions.

2. The operator of an aeroplane which is involved in an aeroplane accident or serious incident shall without delay, provide any information as required by the Technical Instructions.
  3. The operator of an aeroplane shall include procedures in appropriate manuals and accident contingency plans to enable this information to be provided.
- (e) Information in the event of an in-flight emergency.
1. If an in-flight emergency occurs the commander shall, as soon as the situation permits, inform the appropriate air traffic services unit of any dangerous goods carried as cargo on board the aeroplane as specified in the Technical Instructions.

OPS 1.1220

**Training programmes**

- (a) An operator shall establish and maintain staff training programmes, as required by the Technical Instructions, which shall be approved by the Authority.
- (b) An operator must ensure that staff receive training in the requirements commensurate with their responsibilities.
- (c) An operator must ensure that training is provided or verified upon the employment of a person in a position involving the transport of dangerous goods by air.
- (d) An operator shall ensure that all staff who receive training undertake a test to verify understanding of their responsibilities.
- (e) An operator shall ensure that all staff who require dangerous goods training receive recurrent training at intervals of not longer than two years.
- (f) An operator shall ensure that records of dangerous goods training are maintained for all staff as required by the Technical Instructions.
- (g) An operator shall ensure that his handling agent's staff are trained as required by the Technical Instructions.

OPS 1.1225

**Dangerous goods incident and accident reports**

- (a) An operator shall report dangerous goods incidents and accidents to the Authority and the appropriate Authority in the State where the accident or incident occurred, as provided for in Appendix 1 to OPS 1.1225. The first report shall be despatched within 72 hours of the event unless exceptional circumstances prevent this and include the details that are known at that time. If necessary, a subsequent report must be made as soon as possible whatever additional information has been established.
  - (b) An operator shall also report to the Authority and the appropriate Authority in the State where the event occurred, the finding of undeclared or misdeclared dangerous goods discovered in cargo or passengers' baggage, as provided for in Appendix 1 to OPS 1.1225. The first report shall be despatched within 72 hours of the discovery unless exceptional circumstances prevent this and include the details that are known at that time. If necessary, a subsequent report must be made as soon as possible whatever additional information has been established.
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*Appendix 1 to OPS 1.1225***Dangerous goods incident and accident reports**

1. An operator shall ensure that any type of dangerous goods incident or accident is reported, irrespective of whether the dangerous goods are contained in cargo, mail, passengers' baggage or crew baggage. The finding of undeclared or misdeclared dangerous goods in cargo, mail or baggage shall also be reported.
  2. The first report shall be despatched within 72 hours of the event unless exceptional circumstances prevent this. It may be sent by any means, including e-mail, telephone or fax. This report shall include the details that are known at that time, under the headings identified in paragraph 3. If necessary, a subsequent report shall be made as soon as possible giving all the details that were not known at the time the first report was sent. If a report has been made verbally, written confirmation shall be sent as soon as possible.
  3. The first report and any subsequent report shall be as precise as possible and contain such of the following data that are relevant:
    - (a) date of the incident or accident or the finding of undeclared or misdeclared dangerous goods;
    - (b) location, the flight number and flight date;
    - (c) description of the goods and the reference number of the air waybill, pouch, baggage tag, ticket, etc;
    - (d) proper shipping name (including the technical name, if appropriate) and UN/ID number, when known;
    - (e) class or division and any subsidiary risk;
    - (f) type of packaging, and the packaging specification marking on it;
    - (g) quantity;
    - (h) name and address of the shipper, passenger, etc.;
    - (i) any other relevant details;
    - (j) suspected cause of the incident or accident;
    - (k) action taken;
    - (l) any other reporting action taken; and
    - (m) name, title, address and telephone number of the person making the report.
  4. Copies of relevant documents and any photographs taken should be attached to a report.
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## SUBPART S

## SECURITY

## OPS 1.1235

**Security requirements**

An operator shall ensure that all appropriate personnel are familiar, and comply, with the relevant requirements of the national security programmes of the State of the operator.

## OPS 1.1240

**Training programmes**

An operator shall establish, maintain and conduct approved training programs which enable the operator's crew members to take appropriate action to prevent acts of unlawful interference such as sabotage or unlawful seizure of aeroplanes and to minimise the consequences of such events should they occur. The training programme shall be compatible with the National Aviation Security programme. Individual crew members shall have knowledge and competence of all relevant elements of the training programme.

## OPS 1.1245

**Reporting acts of unlawful interference**

Following an act of unlawful interference on board an aeroplane the commander or, in his/her absence the operator, shall submit, without delay, a report of such an act to the designated local authority and the Authority in the State of the operator.

## OPS 1.1250

**Aeroplane search procedure checklist**

An operator shall ensure that there is on board a checklist of the procedures to be followed in search of a bomb or improvised explosive device (IED) in case of suspected sabotage and for inspecting aeroplanes for concealed weapons, explosives or other dangerous devices where a well founded suspicion exists that the aeroplane may be the object of an act of unlawful interference. The checklist shall be supported by guidance on the appropriate course of action to be taken should a bomb or suspicious object be found and information on the least-risk bomb location specific to the aeroplane where provided by the Type Certificate holder.

## OPS 1.1255

**Flight crew compartment security**

- (a) In all aeroplanes which are equipped with a flight crew compartment door, this door shall be capable of being locked, and means or procedures acceptable to the Authority shall be provided or established by which the cabin crew can notify the flight crew in the event of suspicious activity or security breaches in the cabin.
- (b) All passenger-carrying aeroplanes of a maximum certificated take-off mass in excess of 45 500 kg or with a maximum approved passenger seating configuration greater than 60 shall be equipped with an approved flight crew compartment door that is capable of being locked and unlocked from each pilot's station and designed to meet the applicable retroactive airworthiness operational requirements. The design of this door shall not hinder emergency operations, as required in applicable retroactive airworthiness operational requirements.

- (c) In all aeroplanes which are equipped with a flight crew compartment door in accordance with subparagraph (b):
1. this door shall be closed prior to engine start for take-off and will be locked when required by security procedure or the commander, until engine shut down after landing, except when deemed necessary for authorised persons to access or egress in compliance with National Aviation Security Programme;
  2. means shall be provided for monitoring from either pilot's station the area outside the flight crew compartment to the extent necessary to identify persons requesting entry to the flight crew compartment and to detect suspicious behaviour or potential threat.'
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