

# **APPENDIX 3. ADDITIONAL REQUIREMENTS FOR APPROVED OPERATIONS BY SINGLE-ENGINE TURBINE-POWERED AEROPLANES AT NIGHT AND/OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)**

*(See Chapter 5, 5.4.1)*

Airworthiness and operational requirements provided in accordance with Chapter 5, 5.4.1, shall satisfy the following:

## **1. Turbine engine reliability**

1.1 Turbine engine reliability shall be shown to have a power loss rate of less than 1 per 100 000 engine hours.

*Note.— Power loss in this context is defined as any loss of power, the cause of which may be traced to faulty engine or engine component design or installation, including design or installation of the fuel ancillary or engine control systems. (See Attachment H.)*

1.2 The operator shall be responsible for engine trend monitoring.

1.3 To minimize the probability of in-flight engine failure, the engine shall be equipped with:

- a) an ignition system that activates automatically, or is capable of being operated manually, for take-off and landing, and during flight, in visible moisture;
- b) a magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and
- c) an emergency engine power control device that permits continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

## **2. Systems and equipment**

Single-engine turbine-powered aeroplanes approved to operate at night and/or in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight and to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

- a) two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required at night and/or in IMC;
- b) a radio altimeter;
- c) an emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:

- 1) maintain the operation of all essential flight instruments, communication and navigation systems during a descent from the maximum certificated altitude in a glide configuration to the completion of a landing;
  - 2) lower the flaps and landing gear, if applicable;
  - 3) provide power to one pitot heater, which must serve an air speed indicator clearly visible to the pilot;
  - 4) provide for operation of the landing light specified in 2 j);
  - 5) provide for one engine restart, if applicable; and
  - 6) provide for the operation of the radio altimeter;
- d) two attitude indicators, powered from independent sources;
  - e) a means to provide for at least one attempt at engine re-start;
  - f) airborne weather radar;
  - g) a certified area navigation system capable of being programmed with the positions of aerodromes and safe forced landing areas, and providing instantly available track and distance information to those locations;
  - h) for passenger operations, passenger seats and mounts which meet dynamically-tested performance standards and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat;
  - i) in pressurized aeroplanes, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required;
  - j) a landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and
  - k) an engine fire warning system.

### 3. Minimum equipment list

The State of the Operator shall require the minimum equipment list of an operator approved in accordance with Chapter 5, 5.4 to specify the operating equipment required for night and/or IMC operations, and for day/VMC operations.

### 4. Flight manual information

The flight manual shall include limitations, procedures, approval status and other information relevant to operations by single-engine turbine-powered aeroplanes at night and/or in IMC.

### 5. Event reporting

5.1 An operator approved for operations by single-engine turbine-powered aeroplanes at night and/or in IMC shall report all significant failures, malfunctions or defects to the State of the Operator who in turn will notify the State of Design.

5.2 The State of the Operator shall review the safety data and monitor the reliability information so as to be able to take any actions necessary to ensure that the intended safety level is achieved. The State of the Operator will notify major events or trends of particular concern to the appropriate Type Certificate Holder and the State of Design.

## 6. Operator planning

6.1 Operator route planning shall take account of all relevant information in the assessment of intended routes or areas of operations, including the following:

- a) the nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;
- b) weather information, including seasonal and other adverse meteorological influences that may affect the flight; and
- c) other criteria and limitations as specified by the State of the Operator.

6.2 An operator shall identify aerodromes or safe forced landing areas available for use in the event of engine failure, and the position of these shall be programmed into the area navigation system.

*Note 1.— A ‘safe’ forced landing in this context means a landing in an area at which it can reasonably be expected that it will not lead to serious injury or loss of life, even though the aeroplane may incur extensive damage.*

*Note 2.— Operation over routes and in weather conditions that permit a safe forced landing in the event of an engine failure, as specified in Chapter 5, 5.1.2, is not required by Appendix 3, 6.1 and 6.2 for aeroplanes approved in accordance with Chapter 5, 5.4. The availability of forced landing areas at all points along a route is not specified for these aeroplanes because of the very high engine reliability, additional systems and operational equipment, procedures and training requirements specified in this Appendix.*

## 7. Flight crew experience, training and checking

7.1 The State of the Operator shall prescribe the minimum flight crew experience required for night/IMC operations by single-engine turbine-powered aeroplanes.

7.2 An operator’s flight crew training and checking shall be appropriate to night and/or IMC operations by single-engine turbine-powered aeroplanes, covering normal, abnormal and emergency procedures and, in particular, engine failure, including descent to a forced landing in night and/or in IMC conditions.

## 8. Route limitations over water

The State of the Operator shall apply route limitation criteria for single-engine turbine-powered aeroplanes operating at night and/or in IMC on over water operations if beyond gliding distance from an area suitable for a safe forced landing/ditching having regard to the characteristics of the aeroplane, seasonal weather influences, including likely sea state and temperature, and the availability of search and rescue services.

### 9. Operator certification or validation

The operator shall demonstrate the ability to conduct operations by single-engine turbine-powered aeroplanes at night and/or in IMC through a certification and approval process specified by the State of the Operator.

*Note.— Guidance on the airworthiness and operational requirements is contained in Attachment H.*

## APPENDIX 4. ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE

*(Note.— See Chapter 7, 7.2.5)*

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

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

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

- a) the ASE of the aeroplane shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and
- b) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

This is a preview. [Click here to purchase the full publication.](#)

## APPENDIX 5. SAFETY OVERSIGHT OF AIR OPERATORS

(Note.— See Chapter 4, 4.2.1.8)

*Note 1.— Appendix 1 to Annex 19 contains the general provisions for a State safety oversight system.*

*Note 2.— This Appendix provides additional provisions for the safety oversight of international commercial air transport operators.*

### 1. Primary aviation legislation

The State of the Operator shall enact and implement laws that enable the State to regulate the certification and continued supervision of air operators and the resolution of safety issues identified by the authority and to ensure that compliance will result in an acceptable level of safety performance for the operations undertaken.

*Note 1.— The term authority as used in this Appendix refers to the Civil Aviation Authority as well as equivalent organizations, including inspectors and staff.*

*Note 2.— Guidance on the inspection, certification and continued surveillance of operations is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335) and the Airworthiness Manual (Doc 9760).*

### 2. Specific operating regulations

The State of the Operator shall adopt regulations that provide for the certification and continued surveillance of aircraft operations and the maintenance of aircraft in conformity with the Annexes to the Convention on International Civil Aviation.

### 3. State safety oversight system and functions

3.1 The State of the Operator shall ensure that the authority is responsible for the safety oversight of air operators.

3.2 The State of the Operator shall use a methodology to determine its inspector staffing requirements according to the size and complexity of civil air operations in that State.

3.3 **Recommendation.**— *The methodology in 3.2 should be documented.*

3.4 The State of the Operator shall ensure that authority inspectors have adequate support, credentials and transportation to accomplish, independently, their certification and continued surveillance tasks.

#### 4. Qualified technical personnel

The State of the Operator shall require that the initial and recurrent training of the authority inspectors include aircraft-specific subjects.

*Note.— Guidance on experience and training for inspectors is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).*

#### 5. Technical guidance, tools and provision of safety-critical information

5.1 The State of the Operator shall ensure that authority inspectors are provided with technical guidance manuals containing the policies, procedures and standards to be used in the certification and continued surveillance of air operators.

5.2 The State of the Operator shall ensure that authority inspectors are provided with technical guidance manuals containing the policies, procedures and standards to be used in the resolution of safety issues, including enforcement.

5.3 The State of the Operator shall ensure that authority inspectors are provided with technical guidance manuals that address ethics, personal conduct and the avoidance of actual or perceived conflicts of interest in the performance of official duties.

#### 6. Certification obligations

The State of the Operator shall require, prior to commencement of new commercial air transport operations, air operators to demonstrate that they can safely conduct the proposed operations.

*Note.— Attachment E contains further information in this regard.*

#### 7. Continued surveillance obligations

The State of the Operator shall use an ongoing surveillance plan to confirm that operators continue to meet the relevant requirements for initial certification and that each air operator is functioning satisfactorily.

#### 8. Resolution of safety issues

*Note.— Provisions for the resolution of safety issues are contained in Appendix 1 to Annex 19.*

## APPENDIX 6. AIR OPERATOR CERTIFICATE (AOC)

*(Note. — See Chapter 4, 4.2.1.5 and 4.2.1.6)*

### 1. Purpose and scope

1.1 The AOC and its associated model specific operations specifications shall contain the minimum information required in paragraphs 2 and 3 respectively, in a standardized format.

1.2 The air operator certificate and its associated operations specifications shall define the operations for which an operator is authorized.

*Note.— Attachment E, paragraph 3.2.2, contains additional information that may be listed in the operations specifications associated with the air operator certificate.*

### 2. AOC template

*Note.— Chapter 6, 6.1.2, requires a certified true copy of the AOC to be carried aboard.*

<b>AIR OPERATOR CERTIFICATE</b>		
1	<b>STATE OF THE OPERATOR<sup>2</sup></b>	1
	<b>ISSUING AUTHORITY<sup>3</sup></b>	
AOC # <sup>4</sup> : Expiry date <sup>5</sup> :	<b>OPERATOR NAME<sup>6</sup></b>  Dba trading name <sup>7</sup> : Operator address <sup>8</sup> : Telephone <sup>9</sup> : Fax: E-mail:	<b>OPERATIONAL POINTS OF CONTACT<sup>10</sup></b>  Contact details, at which operational management can be contacted without undue delay, are listed in _____ <sup>11</sup> .
This certificate certifies that _____ <sup>12</sup> is authorized to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual and the _____ <sup>13</sup> .		
Date of issue <sup>14</sup> :	Name and signature <sup>15</sup> : Title:	

*Notes.—*

1. *For use of the State of the Operator.*
2. *Replace by the name of the State of the Operator.*
3. *Replace by the identification of the issuing authority of the State of the Operator.*
4. *Unique AOC number, as issued by the State of the Operator.*
5. *Date after which the AOC ceases to be valid (dd-mm-yyyy).*
6. *Replace by the operator's registered name.*
7. *Operator's trading name, if different. Insert "dba" before the trading name (for "doing business as").*
8. *Operator's principal place of business address.*
9. *Operator's principal place of business telephone and fax details, including the country code. E-mail to be provided if available.*

10. The contact details include the telephone and fax numbers, including the country code, and the e-mail address (if available) at which operational management can be contacted without undue delay for issues related to flight operations, airworthiness, flight and cabin crew competency, dangerous goods and other matters, as appropriate.
11. Insert the controlled document, carried on board, in which the contact details are listed, with the appropriate paragraph or page reference, e.g.: “Contact details are listed in the operations manual, Gen/Basic, Chapter 1, 1.1” or “... are listed in the operations specifications, page 1” or “... are listed in an attachment to this document”.
12. Operator’s registered name.
13. Insertion of reference to the appropriate civil aviation regulations.
14. Issuance date of the AOC (dd-mm-yyyy).
15. Title, name and signature of the authority representative. In addition, an official stamp may be applied on the AOC.

### 3. Operations specifications for each aircraft model

*Note.— Chapter 6, 6.1.2, requires a copy of the operations specifications of this section to be carried aboard.*

3.1 For each aircraft model in the operator’s fleet, identified by aircraft make, model and series, the following list of authorizations, conditions and limitations shall be included: issuing authority contact details, operator name and AOC number, date of issue and signature of the authority representative, aircraft model, types and area of operations, special limitations and authorizations.

*Note.— If authorizations and limitations are identical for two or more models, these models may be grouped in a single list.*

3.2 The operations specifications layout referred to in Chapter 4, 4.2.1.6, shall be as follows:

*Note.— The MEL constitutes an integral part of the operations manual.*

<b>OPERATIONS SPECIFICATIONS</b> (subject to the approved conditions in the operations manual)				
<b>ISSUING AUTHORITY CONTACT DETAILS<sup>1</sup></b>				
Telephone: _____		Fax: _____		E-mail: _____
AOC# <sup>2</sup> : _____		Operator name <sup>3</sup> : _____		Date <sup>4</sup> : _____ Signature: _____
Dba trading name: _____				
Aircraft model <sup>5</sup> : _____				
Types of operation: Commercial air transportation <input type="checkbox"/> Passengers <input type="checkbox"/> Cargo <input type="checkbox"/> Other <sup>6</sup> : _____				
Area(s) of operation <sup>7</sup> : _____				
Special limitations <sup>8</sup> : _____				
SPECIAL AUTHORIZATIONS	YES	NO	SPECIFIC APPROVALS <sup>9</sup>	REMARKS
Dangerous goods	<input type="checkbox"/>	<input type="checkbox"/>		
Low visibility operations				
Approach and landing	<input type="checkbox"/>	<input type="checkbox"/>	CAT <sup>10</sup> : _____ RVR: _____ m DH: _____ ft	
Take-off	<input type="checkbox"/>	<input type="checkbox"/>	RVR <sup>11</sup> : _____ m	
Operational credit(s)	<input type="checkbox"/>	<input type="checkbox"/>	<sup>12</sup>	
RVSM <sup>13</sup> <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>		
EDTO <sup>14</sup> <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>	Threshold time <sup>15</sup> : _____ minutes Maximum diversion time <sup>15</sup> : _____ minutes	
Navigation specifications for PBN operations <sup>16</sup>	<input type="checkbox"/>	<input type="checkbox"/>		<sup>17</sup>
Continuing airworthiness	<input type="checkbox"/>	<input type="checkbox"/>	<sup>18</sup>	
EFB	<input type="checkbox"/>	<input type="checkbox"/>	<sup>19</sup>	
Other <sup>20</sup>	<input type="checkbox"/>	<input type="checkbox"/>		

Notes.—

1. Telephone and fax contact details of the authority, including the country code. E-mail to be provided if available.
2. Insert the associated AOC number.
3. Insert the operator's registered name and the operator's trading name, if different. Insert "dba" before the trading name (for "doing business as").
4. Issuance date of the operations specifications (dd-mm-yyyy) and signature of the authority representative.
5. Insert the Commercial Aviation Safety Team (CAST)/ICAO designation of the aircraft make, model and series, or master series, if a series has been designated (e.g. Boeing-737-3K2 or Boeing-777-232). The CAST/ICAO taxonomy is available at: <http://www.intlaviationstandards.org/>.

This is a preview. Click here to purchase the full publication.