

# Democratic Socialist Republic of Sri Lanka



## Civil Aviation Authority of Sri Lanka

### Implementing Standards

(Issued under Sec. 120, Civil Aviation Act No. 14 of 2010)

### **Title: Compliance to Annex-6-Part 1 – Chapter 7- Requirements for Aircraft Communication, Navigation and Surveillance Equipment**

**Reference No. :** IS-6-(i)-7

**SLCAIS:** 016

**Date:** 15<sup>th</sup> March 2018

Pursuant to Sec. 120 of the Civil Aviation Act No.14 of 2010, Director General of Civil Aviation shall have the power to issue, whenever he considers it necessary or appropriate to do so, such Implementing Standards for the purpose of giving effect to any of the provisions of the Civil Aviation Act, any regulations or rules made thereunder including the Articles of the Convention on International Civil Aviation which are specified in the Schedule to the Act.

Accordingly, the undersigned being the Director General of Civil Aviation do hereby issue the Implementing Standards as mentioned in the Attachment hereto (Ref: IS-6-(i)-7-Att-01), for the purpose of giving effect to the provisions in the aforementioned Act and Standards & Procedures described under Article 37 of the Convention, which are specified in the Attachment.

This document supersedes the Implementing Standard 058 and shall be treated as null and void.

These Implementing Standards shall come into force with immediate effect and remain in force unless revoked.

Attention is also drawn to sec. 103 of the Act, which states inter alia that failure to comply with Implementing Standard is an offence.

H.M.C. Nimalsiri  
Director General of Civil Aviation and  
Chief Executive Officer

Civil Aviation Authority of Sri Lanka  
152/1, Minuwangoda Road,  
Katunayake.

Enclosure: Attachment No. IS-6-(i)-7-Att-01

## **Implementing Standards**

### **Title: Compliance to Annex-6-Part 1 – Chapter 7- Requirements for Aircraft Communication, Navigation and Surveillance Equipment**

#### **GENERAL:**

- i. Requirements contained in this document are based on the amendments up to 42 of the 10<sup>th</sup> edition of ICAO Annex 6 – Part I “Operation of Aircraft” Chapter 7 – Aircraft communication, navigation and surveillance equipment.
- ii. The requirements contained in this document are applicable to person/organizations holding an air operator certificate issued by Director-General of Civil Aviation, Sri Lanka for commercial air transportation and prospective applicants for air operator certificate for commercial air transportation.
- iii. Holders of Air Operator Certificate issued by the DGCA for commercial air transportation shall comply with the requirements published in this document and are hereby instructed to forward to the DGCA a “Declaration of Conformance” which indicates the degree of compliance with each item detailed in the document.
- iv. This document supersedes the Implementing Standard 058 and shall be treated as null and void.
- v. This document may be amended from time to time and the amendments will be reflected with the vertical line on the right side of the text.

#### **REQUIREMENTS FOR AIRCRAFT COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT**

##### **1. Communication equipment**

- 1.1** An aeroplane shall be provided with radio communication equipment capable of:
  - a. conducting two-way communication for aerodrome control purposes;
  - b. receiving meteorological information at any time during flight; and
  - c. conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority. These requirements of 1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions, which are normal for the route.
- 1.2** The radio communication equipment required in accordance with paragraph 1.1 shall provide for communications on the aeronautical emergency frequency 121.5 MHz.
- 1.3** For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aeroplane shall, in addition to the requirements specified in 1.1 of this IS.

- a. be provided with communication equipment which will enable it to operator in accordance with the prescribed RCP specifications; and
- b. be authorized by the DGCA for operations in such airspace.
- c. have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aeroplane documentation approved by the DGCA; and
- d. have information relevant to the aeroplane RCP specification capabilities included in the MEL.

*Note* — Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).

**1.4** For operations where an RCP specification for PBC has been prescribed, the operator shall establish and document:

- a) normal and abnormal procedures, including contingency procedures;
- b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;
- c) a training programme for relevant personnel consistent with the intended operations; and
- d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

**1.5** In respect of those aeroplanes mentioned in 1.3, adequate provisions shall exist for:

- a) receiving the reports of observed communication performance issued by monitoring programmes established in accordance with ICAO Annex 11, Chapter 3, 3.3.5.2; and
- b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specification(s).

## **2. Navigation equipment**

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

- a. in accordance with its operational flight plan; and
- b. in accordance with the requirements of air traffic services; except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.

**2.2** For operations where a navigation specification for performance based navigation has been prescribed, an aeroplane shall, in addition to the requirements specified in paragraph 2.1:

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

- b. be authorized by the DGCA for such operations. Operators are advised to refer to the SLCAP 4220 - Performance-based Navigation Manual for information on performance-based navigation and guidance concerning the implementation and operational approval process.
- c. have information relevant to the aeroplane navigation specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of the Design or DGCA; and
- d. have information relevant to the aeroplane navigation specification capabilities included in the MEL.

*Note: Guidance on aeroplane documentation is contained with PBN manual (Doc 9613)*

**2.3** For operations where a navigation specification for PBN has been prescribed, the operator shall establish and document:

- a. normal and abnormal procedures including contingency procedures;
- b. flight crew qualification and proficiency requirements in accordance with the appropriate navigation specifications;
- c. a training programme for relevant personnel consistent with the intended operations; and
- d. Appropriate maintenance procedures to ensure continued airworthiness in accordance with the appropriate navigation specifications.

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

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

**2.4** A specific approval is required from DGCA for operations based on PBN authorization required (AR) navigation specifications.

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

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

- a. continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and
- b. has been authorized by the Director General of Civil Aviation for MNPS operations concerned. The operators are advised that the prescribed minimum navigation

performance specifications and the procedures governing their application are published in the ICAO Regional Supplementary Procedures (Doc 7030).

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

- a. Shall be provided with equipment which is capable of:
  - i. indicating to the flight crew the flight level being flown;
  - ii. automatically maintaining a selected flight level;
  - iii. providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed  $\pm 90$  m (300 ft); and
  - iv. automatically reporting pressure-altitude;
- b. shall be authorized by the DGCA if the requirements stipulated in Aviation Safety Notice No. 95 are met, for operation in the airspace concerned; and
- c. shall demonstrate a vertical navigation performance in accordance with Appendix 1 of this IS.

**2.7** Prior to granting the RVSM approval required in accordance with paragraph 2.6 b), following requirements shall be satisfied,

- a. the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Appendix 1;
- b. the operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and
- c. the operator has instituted appropriate flight crew procedures for operations in RVSM airspace.

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

**2.8** In respect of those aeroplanes mentioned in paragraph 2.6, adequate provisions shall exist for:

- a. receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with Annex 11, 3.3.4.1 and
- b. taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operation in airspace where RVSM is applied.

- 2.9** A holder of an AOC shall have a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1000 flight hours per aeroplane, whichever period is longer. If the operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

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

- 2.10** DGCA is responsible for airspace where RVSM has been implemented and for approving operators for RVSM operation and therefore shall establish provisions and procedures which ensure that appropriate action will be taken in respect of aircraft and operators found to be operating in RVSM airspace without a valid RVSM approval.

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

*Note 2* — *Guidance material relating to the approval for operation in RVSM airspace is contained in the Manual on a 300 m (1000 ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive (Doc 9574).*

- 2.11** The aeroplane shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with paragraph 2.1 and where applicable paragraph 2.2, 2.5 and 2.6 of this IS. The operators are advised that Guidance material relating to aircraft equipment necessary for flight in airspace where RVSM is applied is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc. 9574).

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

### **3. SURVEILLANCE EQUIPMENT**

- 3.1** An aeroplane shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

- 3.2** For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), an aeroplane shall, in addition to the requirements specified in 3.1:

- a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);
- b) have information relevant to the aeroplane RSP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or State of Registry; and

- c) have information relevant to the aeroplane RSP specification capabilities included in the MEL.

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

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

**3.3** For operations where an RSP specification for PBS has been prescribed, the operator shall establish and document:

- a) normal and abnormal procedures, including contingency procedures;
- b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;
- c) a training programme for relevant personnel consistent with the intended operations; and
- d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

**3.4** The State of the Operator shall ensure that, in respect of those aeroplanes mentioned in 3.2, adequate provisions exist for:

- a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with Annex 11, Chapter 3, 3.3.5.2; and
- b) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification(s).

#### **4. Installation**

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

#### **5. Electronic navigation data management**

**5.1** An operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the Director General of Civil Aviation has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity, and that the products are compatible with the intended function of the existing equipment. The Director General of Civil Aviation shall ensure that the operator continues to monitor both the process and products.

*Note — Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.*

- 5.2** An operator shall implement procedures that ensure that timely distribution and insertion of current and unaltered electronic navigation data to all necessary aircraft.



## APPENDIX 1

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

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25m (80ft) 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 25m (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 of the above, 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.