

Democratic Socialist Republic of Sri Lanka



Civil Aviation Authority of Sri Lanka

Implementing Standards

(Issued under Section 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

IS Reference Code: CA-IS-6-(i)-7

Date of Issue: 10.01.2023

Pursuant to Section 120 of the Civil Aviation Act No.14 of 2010 (hereinafter referred to as the CA Act), Director General of Civil Aviation (hereinafter referred to as the DGCA) 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 provision in the CA Act, Regulations or Rules made thereunder including the Articles of the Convention on International Civil Aviation specified in the Schedule to the CA Act.

Accordingly, I, being the DGCA do hereby issue the Implementing Standards on Compliance to **Annex 6 - Part (I) - Chapter 7 - Requirements for Aircraft Communication, Navigation and Surveillance Equipment** as mentioned in the Attachment hereto (Ref: IS-6-(i)-7-Att-01) elaborating the requirements to be satisfied for the effective implementation of the International Standards and Recommended Practices contained in ICAO Annex 6.

This implementing Standard shall be applicable to holders of Air Operator Certificate, Foreign Air Operator Certificate issued by DGCA and any applicant seeking an Air Operator Certificate or Foreign Air Operator Certificate and shall come in to force with effect from 10th of January 2023 and remain force unless revised/revoked.

This Implementing Standard will supersede 01st Edition, Rev 01 of Implementing Standard 016 dated 15th March 2018 issued by the DGCA.

Attention is also drawn to Section 103 of the CA Act, which states inter alia that failure to comply with any Implementing Standard is an offence. Further, if any standard stipulated in this Implementing Standard is not complied with or violated, an appropriate enforcement action will be taken as per the Aviation Enforcement Policy and Procedures Manual, SLCAP 0005 by the DGCA under Section 102 of the CA Act,

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Director General of Civil Aviation and
Chief Executive Officer

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

PREAMBLE

1. Notice to the Recipient

- 1.1 The requirements in this Implementing Standard are based on the Standards and Recommended Practices (SARPs) adopted by the International Civil Aviation Organization (ICAO) and incorporated in the 12th Edition to Annex 06 Part I, Requirements for Aircraft Communication, Navigation and Surveillance Equipment
- 1.2. In pursuance of the obligation cast under Article 38 of the Convention which requires the Contracting States to notify the ICAO of any differences between the national regulations of the States and practices and the International Standards contained in the respective Annex and any amendments thereto, the CAASL will be taking steps to notify ICAO of such differences relating to either a Standard or a Recommended Practice, if any. The CAASL will also keep the ICAO currently informed of any differences which may subsequently occur, or of the withdrawal of any differences previously notified. Furthermore, the CAASL will take steps for the publication of differences between the national regulations and practices and the related ICAO Standards and Recommended Practices through the Aeronautical Information Service, which is published in accordance with the provisions in the Annex-15 to the Convention.
- 1.3. Taking into account of the ICAO council resolution dated 13 April 1948 which invited the attention of Contracting States of the desirability of using in the State's national regulations, as far as is practicable, the precise language of those ICAO Standards that are of a regulatory character, to the greatest extent possible the CAASL has attempted to retain the ICAO texts in the Annex in drafting this Implementing Standard.
- 1.4. Status of ICAO Annex components in the Implementing Standard
Some of the components in an ICAO Annex are as follows and they have the status as indicated:
- 1.4.1. **Standard:** Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38. The ICAO Standards are reflected in the Implementing Standards if they are locally implemented using the normal fonts and recipients are required to conform to such requirements invariably.
- 1.4.2. **Recommended Practice:** Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity, efficiency or environmentally responsiveness of international air navigation, and to which Contracting States will endeavor to conform in accordance with the Convention. The ICAO Recommended Practices are reflected in the Implementing Standards in italic fonts and the Recipients are encouraged to implement them to the greatest extent possible.
- 1.4.3. **Appendices:** Comprising material grouped separately for convenience but forming part of the Standards and Recommended Practices adopted by the Council. Enforcement action on such matters will be as in the case of Standards or Recommended Practices.
- 1.4.4. **Definitions:** A definition does not have independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.
- 1.4.5. **Tables and Figures:** add to or illustrate a Standard or Recommended Practice, and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

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Implementing Standards

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 of this IS 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 of this IS 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 operate in accordance with the prescribed RCP specifications; and
- b) Have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or the DGCA; and
- c) Have information relevant to the aeroplane RCP specification capabilities included in the MEL.

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) specified in the IS 025.

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 of this IS, adequate provisions shall exist for:

- a) Receiving the reports of observed communication performance issued by monitoring programmes established in accordance with IS 025; 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 of this IS.

- 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 4520 - 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.

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.

Guidance on safety risks and mitigations for PBN operations, in accordance to the Performance-based Navigation (SLCAP 4520)

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.

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 DGCA for MNPS operations concerned.

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

- a) The aeroplane 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 ± 90 m (300 ft); and
 - iv. Automatically reporting pressure-altitude, and
- b) The DGCA shall issue a specific approval for RVSM Operations.

2.7 Prior to granting the RVSM specific approval required in accordance with paragraph 2.6 b) of this IS, 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.

A RVSM specific 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 of this IS, adequate provisions shall exist for:

- a) Receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with IS 025 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 The DGCA that has issued an RVSM specific approval to the operator shall establish a requirement which ensures that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If the operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

Monitoring data from any regional monitoring programme established in accordance with IS 025, 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 specific 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 specific approval.

These provisions and procedures need to address both the situation where the aircraft in question is operating without a specific 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 specific approval in the airspace of another State.

Guidance material relating to the specific approval for operation in RVSM airspace is contained in the Manual (SLCAP 4520) on a 300 m (1000 ft) Vertical Separation Minimum between FL 290 and FL 410.

- 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.
- 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 of this IS.
- 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 DGCA; and
 - c) Have information relevant to the aeroplane RSP specification capabilities included in the MEL.
- 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 DGCA shall ensure that, in respect of those aeroplanes mentioned in 3.2 of this IS, adequate provisions exist for:

- a) Receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with IS 025; 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 DGCA has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity, and that the products are compatible with the intended function of the existing equipment. The DGCA shall ensure that the operator continues to monitor both the process and products.

5.2 The AOC holder 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.