MANUAL OF STANDARDS
(175 – AERONAUTICAL INFORMATION SERVICES) 2024

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FIRST SCHEDULE — DEFINITIONS

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In exercise of the powers conferred by paragraph 5(2) of the Civil Aviation Authority of Singapore (Air Navigation Services) Directions 2010 (Ministerial Direction No. 1/2010), the Civil Aviation Authority of Singapore ("the Authority") issues the following Manual of Standards.

PART 1

PRELIMINARY

Citation and commencement

1. This Manual is the Manual of Standards (175 – Aeronautical Information Services) 2024 and comes into operation on 15 April 2024.

Definitions

2. In this Manual, unless the context otherwise requires, any term defined in the First Schedule has the meaning given to that term in that Schedule.

Application of this Manual

3. This Manual applies to the provider of air navigation services within the Singapore Flight Information Region and such other area as the Minister for Transport may authorise (called in this Manual the "Air Navigation Services Provider" or "ANSP") in its provision of aeronautical information services.

PART 2

Division 1 — General

Establishment of Aeronautical Information Service

4. The ANSP must establish an aeronautical information service ("AIS") for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

AIS Operations Manual

5.— (1) The ANSP must establish and maintain an AIS operations manual for its provision of AIS.

(2) The AIS operations manual established for the purposes of sub-paragraph (1) must include —

(a) a statement by the ANSP confirming that the AIS operations manual —

(i) accurately defines the ANSP's organisation structure and the operating procedures that the ANSP's personnel are required to comply with at all times;

(ii) demonstrates the applicable standards of ICAO Annexes 4 – Aeronautical Charts and 15 – Aeronautical Information Services to the Chicago Convention;

(iii) the units of measurement specified in Annex 5 to the Chicago Convention; and

(iv) demonstrates the means and methods of the ANSP's organisation for ensuring continuous compliance with this Manual and the applicable requirements in Part II of the Ministerial Direction No. 1/2010.

(b) the name and the post held by the key personnel who is appointed under paragraph 5 of the Manual of Standards (170 – Air Navigation Services Provider) 2024;

(c) an organisation chart showing the lines of reporting of the key personnel employed or engaged in its provision of AIS;

(d) a job description for each personnel who is responsible for the provision of AIS, which must contain the job function, key responsibilities, and outcome to be achieved by each person who holds that post;

(e) the list of each type of facilities to be operated for the provision of AIS;

(f) procedures to ensure the reliability and availability of each facility;

(g) the procedures or processes required to ensure that every facility utilised by the ANSP in its provision of AIS is operated in accordance with the Operations and Maintenance Plan specified under paragraph 6;

(h) the procedures or processes required under this paragraph that must be included in the AIS operations manual;

(i) the procedures necessary to ensure compliance with —

(i) this Manual of Standards; and

(ii) the Manual of Standards (170 — Air Navigation Services Provider) 2024;

(j) the procedures to control, amend and distribute the AIS operations manual, including the distribution of the initial copy and all subsequent amendments made to the operations manual; and

(k) an analysis of the number of personnel required for the provision of the AIS taking into account the duties and workload required.

(3) The ANSP must ensure that it provides aeronautical information services in accordance with the AIS operations manual established under sub-paragraph (2).

(4) The ANSP must update, amend or add to the operations manual as the ANS Regulator may require for ensuring:

(a) the accuracy of the operations manual; and

(b) the safety, efficiency or regularity of air navigation.

Operations and maintenance plan

6.— (1) The ANSP must establish, implement and maintain an Operations and Maintenance ("O&M") plan for each of its facility used in its provision of AIS.

(2) The O&M plan established under sub-paragraph (1) must –

(a) describe the following matters with respect to each facility —

(i) the role of the facility in its provision of AIS;

(ii) the date on which the facility was commissioned;

(iii) the power supply configuration;

(iv) the current system design architecture;

(v) the location of the facility;

(vi) the list of industry or regulatory standards which the facility is required to comply with;

(vii) list of interfaces with other systems;

(viii) the safety assessment that had been conducted for the facility;

(ix) the safety performance indicators of that facility, if applicable; and

(x) the services that support the operations and maintenance of the facility;

(b) describe the following matters with respect to the personnel involved in the operation and maintenance of the facility —

(i) the roles and responsibilities of the personnel, including the relevant organisation chart;

(ii) the job descriptions of the personnel, including the job purpose, key responsibilities, and outcomes to be achieved by the personnel;

(iii) an analysis of the number of the personnel required to operate and maintain the facility taking into account the workload required;

(c) specify the ISO 9000 Quality Management System procedures that have been audited and certified by an ISO certification body pursuant to paragraph 24(3) to ensure the reliability and availability of each facility, including —

(i) the preventive and corrective maintenance plans;

(ii) the operation and maintenance instructions;

(iii) the timely and appropriate detection, warning and rectification of failures and degradations of each facility and its monitoring systems;

(iv) the measures to control the probability of failures and degradations to as low as reasonably practicable, which may include, but is not limited to, analysis of trends;

(v) the contingency plans in the event of facility failure or degradation, including backup facilities and procedures;

(vi) the documentation of the actions to be performed to address facility failures and degradations, and the outcomes of unresolved failures and degradations;

(vii) the arrangements to provide a safe and conducive environment for the operation and maintenance of the facility, including fire prevention, temperature, humidity, pest control, grass cutting, lightning protection and kept clutter-free;

(viii) the recording of all actions that were performed on each facility, such as those related to maintenance, failure, degradation, modification, removal and restoration of the AIS;

(ix) the facility support plan for the life cycle of each facility, which may include spares support, spares management and provision of technical support; and

(x) the management of obsolete hardware and software.

(d) specify the procedures to verify that the facility continues to meet the requirements in this paragraph for such time as the facility is used in its provision of AIS.

Documents and records to be maintained

7.— (1) The ANSP must maintain all documents and records which are necessary for —

(a) the commissioning, operation and maintenance, temporary removal and decommissioning of each facility used in its provision of AIS; and

(b) the operations of the AIS.

(2) A copy of each document must be made available to the personnel involved in its provision of AIS.

(3) The documents mentioned in sub-paragraph (1) include but not limited to —

(a) this Manual of Standards;

(b) the AIS operations manual;

(c) ICAO Annexes 4 – Aeronautical Charts and 15 – Aeronautical Information Services, Doc 10066 – Procedures for Air Navigation Aeronautical Information Management (PANS- AIM) and other relevant ICAO documents;

(d) records of all incoming and outgoing aeronautical information to be identified by serial number and date;

(e) a list of persons who are authorised to check, edit and publish aeronautical information;

(f) records of quality and safety audit reports;

(g) records of reporting, investigation and correction of errors;

(h) records of the job descriptions, training programmes and training plans of the AIS personnel;

(i) such other manuals, plans, procedures, reports and checklists relating to each facility, for example system manuals, maintenance plan and maintenance operation management plan.

Control of Documents

8.— (1) The ANSP must establish a process for amending the documents mentioned in paragraph 7(1) to ensure that they are up to date.

(2) The ANSP must establish a system to ensure that—

(a) the currency of the documents can be readily determined;

(b) amendments to the documents are controlled in accordance with paragraph 24 on Quality Management System;

(c) only current versions of documents are made available and utilised for operations; and

(d) any amendment to the AIS operations manual and O&M plans is notified to the ANS Regulator in a timely manner.

(3) The ANSP must ensure that every document that is generated by a computer or electronically is subject to the same control procedures as a paper document.

Training Requirements

9.— (1) The ANSP must take all reasonably practicable measures to ensure that every personnel engaged in its provision of AIS, including relevant employees of any contractor who provides a service to the AIS provider, are appropriately trained and possess the competencies required in the provision of AIS.

(2) The ANSP must establish and maintain a training programme, including a suitable period of supervised on-the-job training, for the personnel of the AIS provider to ensure that such personnel possess the competencies, and the associated knowledge, skills and attitudes required to perform specific assigned functions.

[Revision 1, effective 28 Nov 2024]

(3) The ANSP must establish initial and periodic assessments that require the personnel of the AIS provider to demonstrate the required competencies, and to detect and correct shortfalls in knowledge, skills and attitudes.

[Revision 1, effective 28 Nov 2024]

(4) The ANSP must not deploy any personnel for duty or function in its provision of AIS unless the personnel has completed the required period of supervised on-the-job training.

(5) The ANSP must maintain individual training records for each of the personnel of the AIS provider, which must include a training plan detailing the courses completed, the courses to be taken and the time within which each course must be taken.

(6) The ANSP must conduct an annual review of the training plan for each personnel at the beginning of the year to identify any gaps in competency, changes in training requirement and prioritise the type of training required for the coming year, including the personnel of each of its contractors involved in its provision of AIS.

Personnel Requirements

10. The ANSP must directly employ, contract or otherwise engage personnel, including maintenance personnel, who are suitably qualified and competent for the provision of AIS.

Division 2 — Commissioning, temporary removal and decommissioning of an AIS facility

Commissioning of facility

11.— (1) The ANSP must take all reasonably practicable measures to ensure that each AIS facility is designed, installed and commissioned to meet the applicable operational specifications for the facility.

(2) The ANSP must develop and apply appropriate procedures for commissioning an AIS facility for operational use in any of the following circumstances (called in this Manual commissioning procedures) –

(a) implementation and operationalisation of a new AIS facility;

(b) relocation of an existing AIS facility;

(c) modification of an existing AIS facility leading to changes in the provision of AIS; or

(d) restoration to service of an AIS facility that was removed from service temporarily.

(3) The commissioning procedures established under sub-paragraph (2) must —

(a) be appropriate for ensuring that the AIS facility meets the operational specifications applicable to that facility; and

(b) include procedures to enable —

(i) verification that the facility complies with this Manual, the applicable Annexes to the Chicago Convention, the Procedures for Air Navigation Services ("PANS"), and other applicable documents issued by the International Civil Aviation Organisation;

(ii) verification that human factors principles are appropriately applied in the design, operations and maintenance of the facility;

(iii) verification of the system performance of the facility;

(iv) the completion and submission of a risk assessment or safety case (as the case may be) conducted in accordance with paragraph 8 of the Manual of Standards (170 – Air Navigation Services Provider) 2024; and

(v) acceptance by the ANSP, the persons using the facility for operations and the relevant maintenance contractors of the results of the verification conducted under sub-paragraphs (b)(i), (b)(ii) and (b)(iii).

(4) The ANSP must not use any AIS facility to provide an aeronautical information service unless the commissioning procedures established under sub-paragraph (2) are applied to that facility.

Temporary removal of facility from service

12.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to ensure that any temporary removal from service of an AIS facility is performed safely.

(2) The procedures established under sub-paragraph (1) must include —

(a) an identification of the risks arising from the disruption to the facility's interfaces (for example, with stakeholders, software or hardware) and verification that measures have been taken to mitigate such risks; and

(b) an identification and implementation of maintenance procedures that need to be carried out while the facility is not in use.

Decommissioning of facility

13.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to ensure that the permanent decommissioning and removal from service of an AIS facility is performed safely.

(2) The procedures established under sub-paragraph (1) must include the identification and mitigation of the risks arising from the disruption to the facility's interfaces (for example, with stakeholders, software or hardware) and verification that measures have been taken to mitigate such risks.

Division 3 — Operational Requirements

General AIS operational requirement

14.— (1) The ANSP must take all reasonably practicable measures to ensure that the aeronautical data and aeronautical information necessary for the safety, regularity and

efficiency of air navigation provided by the ANSP's AIS provider are appropriate for the operations of the ATM community, including:

(a) persons involved in flight operations, flight planning and the provision or use of flight simulators; and

(b) the air traffic service unit responsible for flight information service and the service provider responsible for pre-flight information.

(2) The ANSP must —

(a) receive, collate or assemble, edit, format, publish, store and distribute aeronautical data and aeronautical information concerning the airspace for which the ANSP provides air traffic services; and

(b) provide aeronautical data and aeronautical information as aeronautical information products.

(3) The ANSP must ensure that its AIS provider provides AIS continuously over a period of 24 hours.

(4) The ANSP must obtain aeronautical data and aeronautical information from the aeronautical information services provider of other States and such other sources as may be available to enable it to provide pre-flight information service and to meet the need for in-flight information.

(5) The ANSP must not distribute any aeronautical data or aeronautical information unless that data or information —

(a) is clearly identified as having been issued under the authority of that State, in the case of data and information obtained from another State; or

(b) is verified or clearly identified as not having been verified, if verification is not possible, in the case of data or information obtained from other available sources.

(6) The ANSP must promptly make available to the AIS of any State such aeronautical data or aeronautical information as may be necessary for the safety, regularity or efficiency of air navigation when a request is made for such data or information.

Adequate information management resources and processes

15. The ANSP must establish adequate information management resources and processes for the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the air traffic management (ATM) system.

Scope of aeronautical data and aeronautical information

16.— (1) The ANSP must ensure that it receives and manages the following aeronautical data and aeronautical information —

(a) the Air Navigation Act and its aviation safety subsidiary legislation;

(b) rules and procedures required for civil aviation as may be relevant;

(c) aerodromes;

(d) airspace;

(e) ATS routes;

(f) instrument flight procedures;

(g) radio navigation aids and systems;

(h) obstacles;

(i) terrain; and

(j) geographical information.

(2) The ANSP must ensure that the determination and reporting of aeronautical data is in accordance with —

(a) the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data; and

(b) the specifications in PANS-AIM (Doc 10066) Appendix 1.

Common reference systems for air navigation

17.— (1) The ANSP must ensure that it complies with the following common reference systems for air navigation —

(a) Horizontal reference system;

(b) Vertical reference system;

(c) Temporal reference system.

(2) When a geoid model other than the Earth Gravitational Model — 1996 ("EGM-96") model is used as a vertical reference system, a description of the model used, including the parameters required for height transformation between the model and EGM-96, must be provided in the Aeronautical Information Publication.

(3) The ANSP must ensure that —

(a) English text is used for any part of an aeronautical information product that is expressed in plain language and intended for international distribution;

(b) place names are spelt in conformity with local usage, transliterated, when necessary, into the ISO-Basic Latin alphabet;

(c) abbreviations established by the International Civil Aviation Organization are used in aeronautical information products where appropriate and to facilitate distribution of aeronautical data and aeronautical information.

(4) In this paragraph,

(a) "Horizontal reference system" means geographical coordinates indicating latitude and longitude that are expressed in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum as in ICAO Doc 9674 – World Geodetic System – 1984 (WGS-84) Manual;

(b) "Vertical reference system" means the use of —

(i) Mean Sea level (MSL) datum; and

(ii) Earth Gravitational Model — 1996 ("EGM-96") as the global gravity model for international air navigation or a regional, national or local geoid model containing high resolution (short wavelength) gravity field data in geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation on the basis of EGM-96 data,

(c) "Temporal reference system" means the use of —

(i) the Gregorian calendar and Coordinated Universal Time (UTC) as the temporal reference system for international air navigation; or

(ii) a different temporal reference system for some applications, where the feature catalogue, or the metadata associated with an application schema or a data set, as appropriate, includes either a description of that system or a citation for a document that describes that temporal reference system.

Use of automation

18.— (1) The ANSP must ensure that automation is applied in order to ensure the quality, efficiency and cost-effectiveness of aeronautical information services.

(2) The ANSP must ensure that due consideration to the integrity of data and information is given and mitigating steps taken where risks are identified when automated processes are implemented.

(3) The ANSP, in order to meet the data quality requirements specified in paragraph 26, must ensure that automation—

(a) enables digital aeronautical data exchange between the parties involved in the data processing chain; and

(b) uses aeronautical information exchange models and data exchange models designed to be globally interoperable.

Metadata

19.— (1) The ANSP must ensure that metadata as specified in ICAO PANS-AIM (Doc 10066) Chapter 4, is collected for aeronautical data processes and exchange points, and is applied throughout the aeronautical information data chain, from origination to distribution to the next intended user.

(2) The ANSP must ensure that metadata to be collected must include, as a minimum:

(a) the name of the organisations or entities performing any action of originating, transmitting or manipulating the data;

(b) the action performed; and

(c) the date and time the action was performed.

Formal arrangements

20. The ANSP must establish formal arrangements with originators of aeronautical data and aeronautical information in relation to the timely and complete provision of aeronautical data and aeronautical information.

Exchange of aeronautical data and aeronautical information

21.— (1) The ANSP must, as far as reasonably practicable, establish direct contact with other providers of aeronautical information services in order to facilitate the international exchange of aeronautical data and aeronautical information.

(2) The ANSP must provide, without charge and in a mutually agreed form, the following aeronautical information products, upon request from the aeronautical information service provider of a Contracting State:

(a) Aeronautical Information Publication (AIP), including Amendments and Supplements;

(b) Aeronautical Information Circulars (AIC);

(c) NOTAM; and

(d) Aeronautical Charts.

(3) The ANSP must ensure that aeronautical information and aeronautical data provided in the form of digital data to the ANSP is pursuant to an agreement with the Contracting State providing the information or data.

(4) The ANSP must ensure that the procurement of aeronautical data and aeronautical information, including the elements of the aeronautical information products by other entities is subjected to agreements between the ANSP and entities.

(5) The ANSP must use globally interoperable aeronautical data and information exchange models, for the provision of data sets, in accordance with the specifications contained in the PANS-AIM (Doc 10066).

Distribution services

22. The ANSP must establish formal arrangements with originators of aeronautical data and aeronautical information in relation to the timely and complete provision of aeronautical data and aeronautical information.

Copyright

23.— (1) The ANSP must ensure that any aeronautical information product which has been granted copyright protection by the originating State and provided to the ANSP must not be made available to a third party unless the third party is made aware that the product is protected by copyright and that it is appropriately annotated that the product is subject to copyright by the originating State.

(2) The ANSP must ensure that when it receives aeronautical information and aeronautical data in accordance with paragraph 21(3), the receiving State must not provide digital data sets of the providing State to any third party without the consent of the providing State.

Quality Management System

24.— (1) The ANSP must establish and maintain quality management systems, as specified in Chapter 3 of ICAO PANS-AIM (Doc 10066), that:

(a) encompasses all functions of an AIS, as described in paragraph 14;

(b) is demonstrated to be executable for each function stage;

(c) is applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data;

(d) includes the necessary policies, processes and procedures, including those on the use of metadata, to —

(i) ensure and verify that aeronautical data is traceable throughout the aeronautical information data chain; and

(ii) enable any data anomalies or errors detected in the course of producing an aeronautical product to be identified by a root cause and be corrected and communicated to affected users;

(e) provides users with the necessary assurance and confidence that the distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements in this Manual.

(2) The ANSP must define and implement a user feedback system in its quality management system established under sub-paragraph (1).

(3) The ANSP must ensure that the quality management systems established under sub-paragraph (1) follows the International Organisation for Standardisation (ISO) 9000 series of quality assurance standards and is certified by an accredited certification body.

(4) The ANSP must take all necessary measures to monitor compliance with its quality management systems, including:

(a) engaging an independent auditor to conduct an audit at least once a year;

(b) ensuring that action is taken without undue delay to correct the cause of any nonconformity identified by the independent auditor; and

(c) ensuring that all audit observations and remedial actions are evidenced and properly documented.

Human factors considerations

25.— (1) The ANSP must take into consideration human factors principles to ensure that the organisation of its AIS provider and design, contents, processing and distribution of aeronautical data and aeronautical information are optimally utilised.

(2) The ANSP must give due consideration to the integrity of information where human interaction is required and mitigating steps taken where risks are identified.

Data quality requirements

26.— (1) The ANSP must ensure that –

(a) the order of accuracy for aeronautical data is in accordance with its intended use;

(b) the order of resolution of aeronautical data commensurate with the actual data accuracy in accordance with PANS-AIM (Doc 10066) Appendix 1;

(c) the integrity of aeronautical data is maintained in accordance with PANS-AIM (Doc 10066) Appendix 1, throughout the data chain from origination to distribution to the next intended user;

(d) the traceability of aeronautical data is retained as long as the data is in use;

(e) the timeliness of aeronautical data is maintained by including limits on the effective period of the data elements;

(f) aeronautical data is complete in order to support its intended use; and

(g) the format of delivered aeronautical data is adequate to ensure that the data is interpreted in a manner that is consistent with its intended use.

(2) For the purpose of sub-paragraph (1)(c), the ANSP must put in place processes and procedures, based on the applicable integrity classification:

(a) with respect to routine data, to avoid corruption throughout the processing of the data;

(b) with respect to essential data: -

(i) to ensure that corruption does not occur at any stage of the data processing life cycle (e.g. collection, processing, storing, integration, exchange and delivery); and

[Revision 1, effective 28 Nov 2024]

(ii) to include additional measures or steps as needed to address potential risks in the overall processing of aeronautical data to further ensure data integrity at this level.

[Revision 1, effective 28 Nov 2024]

(c) with respect to critical data:

(i) to ensure that corruption does not occur at any stage of the data processing life cycle (e.g. collection, processing, storing, integration, exchange and delivery); and

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(ii) to include additional data integrity assurance processes to mitigate the risk of errors.

[Revision 1, effective 28 Nov 2024]

Aeronautical data and aeronautical information verification and validation

27.— (1) The ANSP must develop and apply policies and procedures to ensure that aeronautical data or aeronautical information to be published as part of an aeronautical information product, is checked before submission to the ANSP, and that all necessary information has been included and is correct.

[Revision 1, effective 28 Nov 2024]

(2) The ANSP must establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements are met.

Data error detection

28. The ANSP must ensure that –

(a) digital data error detection techniques are used during the transmission or storage, or both, of aeronautical data and digital data sets; and

(b) digital data error detection techniques as specified in PANS-AIM (Doc 10066), based on systemic cyclic codes, in order to maintain the data integrity levels as described in paragraph 26(2) are implemented.

Division 4 — Aeronautical Information Products and Services

General

29.— (1) The ANSP must provide aeronautical information in the form of aeronautical information products and associated services.

(2) The ANSP must ensure –

(a) that the order of resolution of aeronautical data provided for each aeronautical information product is in accordance with PANS-AIM (Doc 10066), Appendix 1;

(b) consistency between formats of data and information where aeronautical data and aeronautical information are provided in multiple formats.

Aeronautical information in standardised presentation

30. The ANSP must ensure that –

(a) the AIP, AIP Amendments, AIP Supplements, AIC, NOTAM and aeronautical charts provide aeronautical information in a standardised presentation;

(b) the AIP, AIP Amendments, AIP Supplements, AICs and NOTAMs comply with the specifications in the PANS-AIM (Doc 10066);

(c) digital data sets that replace the elements of standardised presentation comply with the specification in PANS-AIM (Doc 10066);

(d) the AIP, AIP Amendment, AIP Supplement and AIC are provided on paper or as an electronic document.

Distribution services

31.— (1) The ANSP must ensure that AIPs are distributed to authorised users who request them.

(2) The ANSP must ensure that the AIP, AIP Amendments, AIP Supplements and AIC are made available by the most expeditious means.

AIP Requirements

32.— (1) The ANSP must publish an AIP containing current information, data and aeronautical charts relating to the airspace in which Singapore has responsibility for air traffic services. The contents of the AIP must be in accordance with Chapter 5 of Annex 15 and Chapter 5 of PANS-AIM (Doc 10066).

(2) The ANSP must ensure that the AIP includes:

(a) a statement of the competent authority responsible for the air navigation facilities, services or procedures covered by the AIP;

(b) the general condition under which the services or facilities are available for international use;

(c) a list of the significant differences with the ICAO SARPS that Singapore has filed with ICAO with regards to its own regulations and practices;

(d) a summary of any significant regulations and practices followed by Singapore where the ICAO SARPs allow alternative course of action.

AIP Amendment

33.— (1) The ANSP must ensure that:

(a) the AIP is amended or reissued at such regular intervals as may be necessary to keep it up to date;

(b) permanent changes to the AIP are published as AIP Amendment;

(c) each AIP Amendment must be allocated a serial number which must be consecutive;

(d) each AIP Amendment page, including the cover sheet, must display a publication date;

(e) a brief indication of the subjects affected by the amendment must be given on the AIP Amendment cover sheet.

(2) The ANSP must establish and publish the publication dates for its AIP Amendments in the AIP.

AIP Supplement

34.— (1) The ANSP must ensure that the following are published as AIP Supplements –

(a) temporary changes of long duration (three months or longer);

(b) any information of short duration which contains extensive text and/or graphics;

(2) The ANSP must –

(a) ensure that each AIP Supplement is allocated a serial number which must be consecutive and based on the calendar year;

(b) issue a checklist of valid AIP Supplements at intervals of not more than one month.

Electronic AIP (eAIP)

35. The ANSP must ensure that –

(a) every AIP, AIP amendment, AIP Supplement or AIC that is provided as an electronic document ("eAIP") is capable of –

(i) being displayed on an electronic device; and

(ii) being reproduced in printed form;

(b) the information contained in the eAIP and the structure of chapters, sections and sub-sections follow the content and structure of the paper AIP and includes files that allow for printing the paper AIP;

(c) the eAIP is made available on a physical distribution medium (for example CD, DVD) or online on the Internet.

Aeronautical Information Circular

36.— (1) The ANSP must ensure that every AIC that is issued provides –

(a) a long-term forecast of any major change in legislation, regulations, procedures or facilities;

(b) information of a purely explanatory or advisory nature liable to affect flight safety;

(c) information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters.

(2) The ANSP must ensure that an AIC is not used for information that qualifies for inclusion in AIP and NOTAM.

(3) The ANSP must –

(a) review every AIC in force at least once a year to ensure that the contents of that AIC remains valid;

(b) issue a checklist of every current and valid AIC at least once a year; and

(c) ensure that each AIC is allocated a serial number which is in consecutive order and based on the calendar year.

NOTAM

37.— (1) The ANSP must –

(a) establish a NOTAM service for the origination and prompt issuance of a NOTAM; and

(b) designate an International NOTAM Office for Singapore that is operated on a 24-hour basis.

(2) The NOTAM Office of the ANSP established under sub-paragraph (1) must originate and promptly issue a NOTAM concerning any information specified in the Second Schedule.

(3) Unless the information contains extensive text or graphics, or both, the information must be issued in a NOTAM when:

(a) the information to be distributed is of a temporary nature and of short duration;

(b) a significant permanent change to operations is made at short notice; or

(c) a temporary change to operations of a long duration is made at short notice.

(4) Despite sub-paragraph (2), the following information must not be notified by a NOTAM:

(a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft.

(b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary.

(c) temporary obstructions in the vicinity of aerodromes that do not affect the safe operation of aircraft.

(d) partial failure of aerodrome lighting facilities where such failure does not directly affect aircraft operations.

(e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative.

(f) the lack of apron marshalling services and road traffic control.

(g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area.

(h) parachuting when in uncontrolled airspace under VFR when controlled, at promulgated sites or within danger or prohibited areas.

(i) training activities by ground units.

(j) unavailability of back-up and secondary systems if these do not have an operational impact.

(k) limitations to airport facilities or general services with no operational impact.

(l) national regulations not affecting general aviation.

(m) announcement or warnings about possible/potential limitations, without any operational impact.

(n) general reminders on already published information.

(o) availability of equipment for ground units without containing information on the operational impact for airspace and facility users.

(p) information about laser emissions without any operational impact and fireworks below minimum flying heights.

(q) closure of movement area parts in connection with planned work locally coordinated of duration of less than one hour.

(r) closure, changes or unavailability in operation of an aerodrome or a heliport that is not within the operational hours of that aerodrome or heliport.

(s) other non-operational information of a similar temporary nature.

(5) The ANSP must use appropriate telecommunication facilities to issue and receive NOTAM.

(6) Every NOTAM issued by the ANSP must be in a format that is in accordance with –

(a) Annex 15 to the Chicago Convention; and

(b) the specifications in Section 5.2.5.1 General Specifications, Section 5.2.5.2 NOTAM number and series allocation, and Section 5.4.2 NOTAM distribution of the PANS-AIM (Doc 10066).

(7) The ANSP must issue a checklist of valid NOTAM regularly in accordance with PANS-AIM (Doc 10066) Section 5.2.5.3 NOTAM Checklist.

(8) The ANSP must establish agreements with other international NOTAM offices or between the NOTAM offices and multinational NOTAM Processing Units for the exchange of NOTAM.

Distribution of NOTAM

38.— (1) The ANSP must ensure that each NOTAM is distributed on the basis of a request.

(2) The ANSP must prepare a NOTAM that conforms with the relevant provisions of the ICAO communication procedures specified in Annex 10 Volume II to the Chicago Convention and other relevant ICAO documents.

(3) The ANSP must ensure that the aeronautical fixed services ("AFS") is employed for NOTAM distribution.

(4) Despite sub-paragraph (3), if a NOTAM is sent by means other than AFS, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator is used, preceding the text, and the NOTAM that are to be given international distribution must be selected.

(5) The ANSP must ensure that international exchange of NOTAM takes place only as mutually agreed between the international NOTAM offices concerned and multinational NOTAM processing units.

(6) The ANSP must, upon request, grant distribution of NOTAM series other than those distributed internationally.

Division 5 — Digital Data Sets

General

39.— (1) The ANSP must ensure that digital data used in the provision of aeronautical information services is in the form of any of the following data sets, and based on specifications for the content of digital data sets stipulated in PANS-AIM (Doc 10066):

(a) AIP data set;

(b) terrain data sets;

(c) obstacle data sets;

(d) aerodrome mapping data sets; and

(e) instrument flight procedure data sets.

(2) The ANSP must ensure that –

(a) each data set is provided to the next intended user together with at least the minimum set of metadata, based on the specifications in PANS-AIM (Doc 10066), that ensures traceability;

(b) a checklist of valid data sets is regularly provided.

Data set updates

40.— (1) The ANSP must ensure the accuracy and validity of all data sets.

(2) The ANSP must develop and apply procedures to ensure that –

(a) data sets are amended or reissued at regular intervals to keep them up to date;

(b) permanent changes or temporary changes that will be in effect for three months or more are made available as digital data is issued in the form of a complete data set or a subset that includes only the differences from the previously issued complete data set;

(c) when a data set is made available as a completely re-issued data set, the differences from the previously issued complete data set must be indicated; and

(d) updates to the AIP and digital data sets are synchronised.

Requirements relating to AIP data set

41.— (1) The ANSP must ensure that every AIP data set meets the requirements in sub-paragraph (2).

(2) Every AIP data set must –

(a) cover the extent of information as provided in the AIP;

(b) contain the digital representation of aeronautical information of a lasting character.

(3) The ANSP must ensure that the available AIP data subsets are provided when it is not possible to provide a complete AIP data set.

(4) For the purpose of sub-paragraph (2)(b), aeronautical information has a lasting character if it is permanent or is information regarding a temporary change that will be in effect for three months or more.

Terrain data sets

42.— (1) The ANSP must ensure that every terrain data set contains the digital representation of the terrain surface in the form of continuous elevation values at all intersections (points) of a defined grid, referenced to common datum.

(2) The ANSP must ensure that terrain data is provided for –

(a) Area 1;

(b) the following areas within every aerodrome in Singapore that is regularly used by international civil aviation:

(i) Area 2a;

(ii) the take-off flight path area;

(iii) an area bounded by the lateral extents of the aerodrome obstacle limitation surfaces;

(iv) Area 3; and

(v) Area 4 for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.

(3) The ANSP must ensure that additional terrain data is provided for Area 2 within every aerodrome regularly used by international civil aviation as follows:

(a) in the area extending to 10 km from the ARP; and

(b) within the area between 10 km and the Terminal Manoeuvring Area (TMA) boundary or 45 km radius (whichever is smaller) where terrain penetrates a horizontal terrain data collection surface specified as 120 m above the lowest runway elevation.

(4) The ANSP must ensure that every terrain data set –

(a) includes spatial (position and elevation), thematic and temporal aspects for the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles; and

(b) depending on the acquisition method used, the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as "first reflective surface", must be represented.

(5) The ANSP must ensure that in each terrain data set –

(a) only feature type terrain is provided;

(b) the following are listed:

(i) the feature attributes describing terrain annotated as mandatory in PANS-AIM (Doc 10066) Appendix 6; and

(ii) the feature attributes in PANS-AIM (Doc 10066) Appendix 6 Table A6-1 which represent the minimum set of terrain attributes.

(6) The ANSP must ensure that terrain data for each area conforms to the applicable numerical requirements in PANS-AIM (Doc 10066) Appendix 1.

Obstacle data sets

43.— (1) The ANSP must ensure that –

(a) obstacle data sets contain the digital representation of the vertical and horizontal extent of obstacles;

(b) obstacle data is not included in terrain data sets;

(c) obstacle data elements are represented in the data sets by points, lines or polygons;

(d) obstacle data is provided for any obstacle in Area 1 that has a height of 100 m or more above ground; and

(e) obstacle data is provided for any obstacle within Area 2 that is assessed by the ANSP as being a hazard to air navigation.

(2) The ANSP must ensure that obstacle data is provided for every Singapore aerodrome that is regularly used by international civil aviation as follows:

(a) Area 2a –

(i) obstacles that penetrate an obstacle data collection surface outlined by a rectangular area around a runway that comprises the runway strip plus any clearway that exists; and

(ii) the obstacle collection surface must have a height of 3 m above the nearest runway elevation measured along the runway centre line; and

(iii) any portion related to a clearway, at the elevation of the nearest runway end.

(b) objects in the take-off flight path area as specified in paragraph 3.8.2 of Annex 4 to the Chicago Convention, which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area; and

(c) penetrations of the aerodrome obstacle limitation surfaces as specified in Annex 14, Volume 1, Chapter 4.

(d) Areas 2b, 2c and 2d in relation to obstacles that penetrate the relevant obstacle data collection surface specified, as follows:

(i) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15% to each side. The Area 2b obstacle collection surface has a 1.2% slope extending from the ends of Area 2a at the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15% to each side;

(ii) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c is the elevation of the point of Area 2a at which it commences; and

(iii) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45km from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground; but

(iv) data need not be collected for any obstacle that has a height of 3m above ground in Area 2b and a height of less than 15 m above ground in Area 2c.

(e) Area 3 – obstacles that penetrate the relevant obstacle data collection surface extending a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.

(f) Area 4 – every runway where precision approach Category II or III operations have been established.

Meaning of "area"

44. In paragraphs 42 and 43,

Area 1 means the entire territory of Singapore;

Area 2 means within the vicinity of an aerodrome, sub-divided as follows;

Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists.

Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;

Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and

Area 2d: an area outside Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point (ARP), or to an existing terminal control area (TMA) boundary, whichever is nearest;

Area 3 means the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway centre line and 50 m from the edge of all other parts of the aerodrome movement area.

Area 4 means the area extending 900 m prior to the runway threshold and 60 m each side of the extended runway centre line in the direction of the approach on a precision approach runway, Category II or III.

Aerodrome mapping data sets

45.— (1) The ANSP must ensure that aerodrome mapping data sets contain the digital representation of aerodrome features that consist of attributes and geometries, that are characterized as points, lines or polygons (for example, runway thresholds, taxiway guidance lines and parking stand areas).

(2) The ANSP must ensure that aerodrome mapping data sets are made available to every aerodrome that is regularly used by international civil aviation.

Instrument flight procedure data sets

46. The ANSP must ensure that instrument flight procedure data sets –

(a) contain the digital representation of instrument flight procedures; and

(b) are made available for aerodromes regularly used by international civil aviation.

Division 6 — Pre-Flight and Post Flight Information Services

Pre-flight information

47.— (1) The ANSP must make available to flight operations personnel, including flight crews and services responsible for pre-flight information at Singapore aerodromes regularly used by international civil aviation, aeronautical information relative to the route stages originating at the aerodrome.

(2) The ANSP must ensure that aeronautical information provided for pre-flight planning purposes include:

(a) information of operational significance from the elements of the aeronautical information products;

(b) a summary of valid NOTAM of operational significance and other information of an urgent character, in the form of plain-language pre-flight information bulletins (“PIB”).

Automated Pre-flight information

48. The ANSP must ensure that the automated pre-flight information system for the supply of aeronautical data and aeronautical information for self-briefing, flight planning and flight information service:

(a) provides for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical data stored;

(b) permit access to the system by operations personnel, including flight crew members, relevant aeronautical personnel and other aeronautical users through suitable telecommunications means;

(c) allows for the aeronautical data and aeronautical information to be printed as a paper document where is required to be accessed;

(d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate or based on a menu-driven user interface

or other appropriate mechanism as agreed between the civil aviation authority and the relevant aerodrome operator; and

(e) provide rapid response to a user request for information.

Post-flight information

49.— (1) The ANSP must make arrangements to receive information noted by flight crews concerning the state and operation of air navigation facilities or services at every Singapore aerodrome used for international civil aviation.

(2) The ANSP must make arrangements to receive information observed by flight crew concerning the presence of wildlife hazard at every Singapore aerodrome used for international civil aviation.

(3) The ANSP must ensure that the arrangements mentioned in sub-paragraphs (1) and (2) allow for the information received from flight crew to be made available to the AIS provider for distribution as the circumstances necessitate.

Division 7 — Aeronautical Information Regulation and Control (AIRAC)

Aeronautical information regulation and control

50.— (1) The ANSP must distribute under the aeronautical information regulation and control ("AIRAC") system information concerning the following:

(a) horizontal and vertical limits and any regulations or procedures applicable to:

(i) flight information regions;

(ii) control areas;

(iii) control zones;

(iv) advisory areas;

(v) air traffic services routes;

(vi) permanent danger, prohibited and restricted areas, including type and periods of activity when known, and air defence identification zones (ADIZ);

(vii) permanent areas or routes or portions thereof where the possibility of interception exists.

(b) positions, frequencies, call signs, identifiers, known irregularities and maintenance periods of radio navigation aids, and communication and surveillance facilities;

(c) holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent air traffic services procedures;

(d) transition levels, transition altitudes and minimum sector altitudes;

(e) aeronautical meteorological facilities, broadcasts, and procedures;

(f) runways and stopways;

(g) taxiways and aprons;

(h) aerodrome ground operating procedures, including low visibility procedures;

(i) approach and runway lighting; and

(j) the operating minima of every Singapore aerodrome used for international civil aviation, if published.

(2) The ANSP must ensure that –

(a) no change is made to any information notified under the AIRAC system for at least 28 days after the effective date of that information, unless the circumstance notified is of a temporary nature and would not persist for the whole of the 28-day period;

(b) information provided under the AIRAC system is made available to recipients at least 28 days prior to the effective date of the information.

(3) The ANSP must publish, on an annual basis, an AIC that lists the AIRAC effective dates, publication dates and the latest reception dates by which the aeronautical information to be distributed under the AIRAC system has to reach the AIS provider of the ANSP.

(4) The ANSP must ensure that when information has not been submitted by the AIRAC date, a NIL notification is distributed not later than one cycle before the relevant AIRAC effective date.

(5) The ANSP must not use any implementation date other than an AIRAC effective date for pre-planned operationally significant changes requiring cartographic work or for updating of navigation databases.

(6) The ANSP must ensure that when an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a “Trigger” NOTAM must be originated based on specifications in PANS-AIM Doc 10066.

Division 8 — Aeronautical Charts

Aeronautical chart requirements

51.— (1) The ANSP must publish the following aeronautical charts as part of the AIP, or be provided separately to recipients of the AIP:

(a) World Aeronautical Chart – ICAO

(b) Aerodrome Chart – ICAO

(c) Aerodrome Obstacle Chart – ICAO Type A

(d) Aerodrome Obstacle Chart – ICAO Type B

(e) Precision Approach Terrain Chart – ICAO

(f) En-route-Chart – ICAO

(g) Area Chart – ICAO

(h) Standard Departure Chart – Instrument (SID) – ICAO

(i) Standard Arrival Chart – Instrument (STAR) – ICAO

(j) Instrument Approach Chart – ICAO

(k) Visual Approach Chart – ICAO

(l) Aerodrome Ground Movement Chart – ICAO

(m) Aerodrome Terrain and Obstacle Chart – ICAO (Electronic)

(n) Aircraft Parking/Docking Chart – ICAO

(o) Aeronautical Chart – ICAO 1:500,000

(p) Aeronautical Navigation Chart – ICAO Small Scale

(q) Plotting Chart – ICAO chart

(r) ATC Surveillance Minimum Altitude Chart – ICAO

(2) The ANSP must ensure that each aeronautical chart produced by the ANSP complies with the following requirements –

(a) each type of aeronautical chart:

(i) provides information relevant to the function of the chart as required in Annex 4 to the Chicago Convention; and

(ii) is designed in accordance with such human factors principles as to facilitate its optimum use.

(b) the chart resolution of aeronautical data is as specified for that chart in accordance with the PANS-AIM (Doc 10066), Appendix 1;

(c) information in the aeronautical charts is adequate and accurate and are kept up-to-date by a revision service;

(d) each aeronautical chart is accurate, free from distortion and clutter, unambiguous, and readable under all normal operating conditions; and

(e) each aeronautical chart is readily available to users, including users from other Contracting States to the Chicago Convention.

(3) The ANSP must ensure that the aeronautical data quality of each chart meets the following requirements:

(a) the requirements applicable to data integrity and charting resolution in Standard 2.17 of Annex 4 to the Chicago Convention;

(b) the integrity of the data is based upon the integrity classification provided in PANS-AIM (Doc 10066) Appendix 1; and

(c) the integrity of the data is maintained throughout the data process from origination to the next intended user.

(4) The ANSP must provide electronic aeronautical charts that are based on digital databases and the use of geographic information systems.

FIRST SCHEDULE — DEFINITIONS

Paragraph 2.

“Aerodrome” means a defined area on land (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

“Aerodrome mapping data” or “AMD” means data collected for the purpose of compiling aerodrome mapping information for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.

“Aerodrome mapping database” or “AMDB” means a collection of aerodrome mapping data organised and arranged as a structured data set.

“Aeronautical chart” means a representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

“Aeronautical data” means a representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

“Aeronautical fixed service” or “AFS” means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

“Aeronautical Information” means information resulting from the assembly, analysis and formatting of aeronautical data.

“Aeronautical Information Circular” or “AIC” means a notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.

“Aeronautical information management” or “AIM” means the dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

“Aeronautical information product” means aeronautical data and aeronautical information provided either as digital data sets or as a standardised presentation in paper or electronic media, intended primarily to satisfy international requirements for the exchange of aeronautical information, including:

(a) Aeronautical Information Publication (AIP), including Amendments and Supplements;

(b) Aeronautical Information Circulars (AIC);

(c) Aeronautical charts;

(d) NOTAM; and

(e) Digital data sets.

“Aeronautical Information Publication” or “AIP” means a publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

“Aeronautical Information Regulation and Control” or “AIRAC” means a system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices basing establishment, withdrawal or significant changes to aeronautical information upon a series of common effective dates at intervals of 28 days, including 8 November 2018.

“AIP Amendment” means permanent changes to the information contained in the AIP.

“AIP Supplement” means temporary changes to the information contained in the AIP which are provided by means of special pages.

“AIRAC” means an acronym (aeronautical information regulation and control) signifying a system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices basing establishment, withdrawal or significant changes to aeronautical information upon a series of common effective dates at intervals of 28 days, including 8 November 2018.

“Air traffic management” or “ATM” means the dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) safely, economically and efficiently through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

“AIS facility” means any equipment, building or services that supports the provision of AIS.

“Application” means manipulation and processing of data in support of user requirements (as defined in ISO 19104).

“Area navigation” means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

[Revision 3, effective 26 Nov 2026]

“ASHTAM” means a special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations.

“ATM Community” means the aggregate of organisations, agencies, or entities that may participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATM system referred to in Appendix A of ICAO Global Air Traffic Management Concept (Doc 9854).

“ATS surveillance service” means a term used to indicate a service provided directly by means of an ATS surveillance system.

“ATS surveillance system” means a generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

“Automatic dependent surveillance – broadcast” or “ADS-B” means a means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

“Automatic dependent surveillance – contract” or “ADS-C” means a means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

“Automatic terminal information service” or “ATIS” means the automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof and comprises of –

(a) “Data link-automatic terminal information service” or “D-ATIS” and the provision of ATIS via data link;

(b) “Voice-automatic terminal information service” or “Voice-ATIS” and the provision of ATIS by means of continuous and repetitive voice broadcasts.

“Bare Earth” means surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

“Calendar” means the discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (as defined in ISO 19108).

“Canopy” means the bare Earth supplemented by vegetation height.

“Chicago Convention” means the Convention on International Civil Aviation concluded in Chicago on 7 December 1944 (as in force and amended from time to time).

“Confidence level” means the probability that the true value of a parameter is within a certain interval around the estimate of its value.

“Controller-pilot data link communications” or “CPDLC” means a means of communication between controller and pilot, using data link for ATC communications.

“Culture” means all man-made features constructed on the surface of the Earth, such as cities, railways and canals.

“Cyclic Redundancy Check” or “CRC” means a mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

“Danger area” means an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

“Data accuracy” means a degree of conformance between the estimated or measured value and the true value.

“Data completeness” means the degree of confidence that all of the data needed to support the intended use is provided.

“Data format” means a structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.

“Data Integrity (assurance level)” means a degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

“Data product” means a data set or data set series that conforms to a data product specification (as defined in ISO 19131).

“Data product specification” means the detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (as defined in ISO 19131).

“Data Quality” means a degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution, integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

“Data resolution” means a number of units or digits to which a measured or calculated value is expressed and used.

“Data set” means an identifiable collection of data (as defined in ISO 19101).

“Data set series” means a collection of data sets sharing the same product specification (ISO 19115).

“Data timeliness” means the degree of confidence that the data is applicable to the period of its intended use.

“Data traceability” means the degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator.

“Datum” means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (as defined in ISO 19104).

“Digital Elevation Model” or “DEM” means the representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

“Direct transit arrangements” means the special arrangements approved by the public authorities concerned by which traffic which is pausing briefly in its passage through the Contracting State may remain under their direct control.

“Ellipsoid height” or “Geodetic height” means the height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

“Feature” means the abstraction of real world phenomena (as defined in ISO 19101).

“Feature attribute” means the characteristic of a feature (as defined in ISO 19101) with a name, a data type and a value domain associated with it.

“Feature operation” means the operation that every instance of a feature type may perform (as defined in ISO 19110).

“Feature relationship” means the relationship that links instances of one feature type with instances of the same or a different feature type (as defined in ISO 19101).

“Feature type” means the class of real world phenomena with common properties (as defined in ISO 19110).

“Geodesic distance” means the shortest distance between any two points on a mathematically defined ellipsoidal surface.

“Geodetic datum” means a minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

“Geoid” means the equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

“Geoid undulation” means the distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

“Gregorian calendar” means the calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (as defined in ISO 19108).

“Height” means the vertical distance of a level, point or an object considered as a point, measured from a specific datum.

“Human Factors Principles” means the principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

“Integrity classification (aeronautical data)” means the classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data is classified as:

(a) Routine data means that there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

(b) Essential data means that there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and

(c) Critical data means that there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

“International airport” means any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

“International NOTAM Office” or “NOF” means an office designated by a State for the exchange of NOTAM internationally.

“Logon address” means a specified code used for data link logon to an ATS unit.

“Manoeuvring area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

“Metadata” means data about data (as defined in ISO 19115). A structured description of the content, quality, condition or other characteristics of data.

“Minimum en-route altitude” or “MEA” means the altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

“Minimum obstacle clearance altitude” or “MOCA” means the minimum altitude for a defined segment of flight that provides the required obstacle clearance.

“Movement area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

“Next intended user” means the entity that receives the aeronautical data or information from the Aeronautical Information Service.

“NOTAM” or “Notice to Airmen” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations, and includes a SNOWTAM and an ASHTAM.

“Obstacle” means all fixed (whether temporary or permanent) and mobile objects, or parts thereof, that —

(a) are located on an area intended for the surface movement of aircraft;

(b) extend above a defined surface intended to protect aircraft in flight; or

(c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

“Obstacle/terrain data collection surface” means a defined surface intended for the purpose of collecting obstacle/terrain data.

“Origination (Aeronautical data or aeronautical information)” means the creation of the value associated with new data or information or the modification of the value of an existing data or information.

“Originator (Aeronautical data or aeronautical information)” means an entity that is accountable for data or information origination and/or from which the AIS organisation receives aeronautical data and information.

“Orthometric height” means the height of a point related to the geoid, generally presented as an MSL elevation.

“Performance-based communication” or “PBC” means the communication based on performance specifications applied to the provision of air traffic services (ATS).

“Performance-based navigation” or “PBN” means the area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

“Performance-based surveillance” or “PBS” means the surveillance based on performance specifications applied to the provision of air traffic services.

“Portrayal” means the presentation of information to humans (as defined in ISO 19117).

“Position (geographical)” means the set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth.

“Post spacing” means the angular or linear distance between two adjacent elevation points.

“Precision” means the smallest difference that can be reliably distinguished by a measurement process. In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.

“Pre-flight information bulletin” or “PIB” means a presentation of current NOTAM information of operational significance, prepared prior to flight.

“Prohibited area” means an airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

“Quality” means the degree to which a set of inherent characteristics fulfils requirements (as defined in ISO 9000). The term “quality” can be used with adjectives such as poor, good or excellent and “Inherent”, as opposed to “assigned”, means existing in something, especially as a permanent characteristic.

“Quality assurance” means the part of quality management focused on providing confidence that quality requirements will be fulfilled (as defined in ISO 9000).

“Quality control” means the part of quality management focused on fulfilling quality requirements (as defined in ISO 9000).

“Quality management” means the coordinated activities to direct and control an organisation with regard to quality (as defined in ISO 9000).

“Radio navigation service” means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

“Required communication performance” or “RCP” specification means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

“Required surveillance performance” or “RSP” specification means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

“Requirement” means the need or expectation that is stated, generally implied or obligatory (as defined in ISO 9000).

“Resolution” means a number of units or digits to which a measured or calculated value is expressed and used.

“Restricted area” means an airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

“Route stage” means a route or portion of a route flown without an intermediate landing.

“Station Declination” means an alignment variation between the zero degree redial of a VOR and true north, determined at the time the VOR station is calibrated.

“SNOWTAM” means a special series NOTAM given in a standard format providing a surface condition report notifying the presence or cessation of hazardous conditions due to snow, ice, slush, frost, standing water or water associated with snow, slush, ice or frost on the movement area.

“Terrain” means the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.

“Traceability” means the ability to trace the history, application or location of that which is under consideration (as defined in ISO 9000).

“Validation” means the confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (as defined in ISO 9000).

“Verification” means the confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (as defined in ISO 9000).

“Volmet” means meteorological information for aircraft in flight.

SECOND SCHEDULE — INFORMATION REQUIRED TO ORIGINATE NOTAM

Paragraph 37(2)

1. A NOTAM must be originated and issued concerning any of the following information:

   (a) establishment, closure or significant changes in operation of an aerodrome or a runway;

   (b) establishment, withdrawal and significant changes in the operation of any air navigation services, including aeronautical information services, air traffic services, communications, navigation and surveillance services, aeronautical meteorological services, and search and rescue operations;

   (c) establishment, withdrawal and significant changes in any operational capability of radio navigation and air-ground communication services, including an interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation and air-ground communication services or limitations of relay stations including operational impact, affected service, frequency and area;

   (d) unavailability of back-up and secondary systems, having a direct operational impact;

   (e) establishment or withdrawal of or significant changes to visual aids;

   (f) interruption of or return to operation of major components of aerodrome lighting systems;

   (g) establishment or withdrawal of or significant changes to procedures for air navigation services;

   (h) occurrence or correction of major defects or impediments in the manoeuvring area;

   (i) changes to and limitations on availability of fuel, oil and oxygen;

   (j) major changes to the availability of search and rescue facilities and services;

   (k) establishment or withdrawal of or return to operation of hazard beacons marking obstacles to air navigation;

   (l) changes in regulations requiring immediate action (for example, a promulgation of a prohibited area for which search and rescue action is to be carried out);

   (m) presence of hazards not otherwise promulgated, which affect air navigation, including obstacles, military exercises and operations, intentional and unintentional radio frequency interferences, rocket launches, displays, fireworks, sky lanterns, rocket debris, races and major parachuting events;

   (n) conflict zones which affect air navigation, including information that is as specific as possible regarding the nature and extent of threats of that conflict and its consequences for civil aviation;

   (o) planned laser emissions, laser displays and search lights if pilots' night vision is likely to be impaired;

   (p) erecting or removal of, or changes to, obstacles to air navigation in the take-off/climb, missed approach, approach areas and runway strip;

(q) establishment or discontinuance, including activation or deactivation as may be applicable, or changes in the status of prohibited, restricted or danger areas;

(r) establishment or discontinuance of areas or routes or portions thereof where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;

(s) allocation, cancellation or change of location indicators;

(t) changes in aerodrome rescue and fire fighting category provided, with reference to Annex 14 of the Chicago Convention, Volume I, Chapter 9, and Attachment A, Section 17;

(u) presence or removal of, or significant changes in, hazardous conditions due to snow, slush, ice, radioactive material, toxic chemicals, volcanic ash deposition or water on the movement area;

(v) outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;

(w) ***deleted***

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(x) an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;

(y) release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions thereof which could be affected and the direction of movement;

(z) establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with procedures or limitations which affect air navigation; and

(aa) implementation of short-term contingency measures in cases of disruption, or partial disruption, of air traffic services and related supporting services.

REVISION HISTORY

This Amendment History is provided for the convenience of users of the Manual of Standards (175 – Aeronautical Information Services) 2024. It is not part of this Manual.

1. Initial Issue, effective 15 April 2024
2. Revision 1, effective 28 November 2024
3. Revision 2, effective 27 November 2025
4. Revision 3, effective 26 November 2026