International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

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Ref.: AN 2/2.3-12/52

23 August 2012

Subject: Proposals for amendments to Annex 15 and consequential amendments to Annexes 4, 11 and 14, Volumes I and II

Action required: Comments to reach Montréal by 23 October 2012

Sir/Madam,

1. I have the honour to inform you that, the Air Navigation Commission, at the fourteenth meeting of its 190th Session held on 26 June 2012, carried out a preliminary review of amendments to Annex 15 — *Aeronautical Information Services*, and consequential amendments to Annex 4 — *Aeronautical Charts*, Annex 11 — *Air Traffic Services*, and Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* and Volume II — *Heliports*, and authorized their transmittal to Member States and interested international organizations for comment.

2. The proposed amendment to Annex 15 is in Attachment A. The consequential amendments to Annexes 4, 11 and 14, Volumes I and II, are in Attachments B to E, respectively.

3. The amendment proposal to Annex 15 includes, inter alia, amendments in regard to responsibilities of States and aeronautical information service (AIS) providers; use of the terms "aeronautical information" and "aeronautical data"; integrity classification and levels; data protection; use of automation enabling digital data exchange; electronic terrain and obstacle data; new provisions related to aerodrome mapping data; aeronautical information publication (AIP) format; and NOTAM codes. The proposed amendments to Annexes 4, 11 and 14, Volumes I and II are consequential to the proposed Annex 15 changes.

4. The amendment proposals have been developed as part of a strategy for the migration of the operational focus of aeronautical information services from a product-centred, paper-based and manually transacted system to a digitally enabled, network-centred and service-oriented information management system. To accomplish this transition, it will be necessary to develop sequential and successive changes to Annex 15. In this proposal, the reorganization of the first three chapters is an evolutionary step in this process. It will facilitate a more complete incorporation of provisions related to aeronautical information management (AIM) scheduled for adoption as part of the next amendment envisioned in 2016 which will reorganize the remaining chapters and be accompanied by the introduction

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of a PANS-AIM. New guidance material with respect to AIM training, quality management, electronic terrain and obstacle data, as well as an amendment to the *Aeronautical Information Services Manual* (Doc 8126) will be issued prior to the planned applicability of this amendment.

5. To facilitate your review of the proposed amendments, the rationale for each proposal has been provided in the text boxes immediately following the proposals throughout Attachments A, B, C, D and E.

6. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the Air Navigation Commission during its final review of the draft amendment.

7. May I request that any comments you may wish to make on the proposed amendment to Annex 15, and consequential amendments to Annexes 4, 11 and 14, Volumes I and II, be dispatched to reach me not later than 23 October 2012. The Air Navigation Commission has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council. In this connection, should you anticipate a delay in the receipt of your reply, please let me know in advance of the due date.

8. For your information, the proposed amendment to Annex 15 and the consequential amendment to Annex 4 are envisaged for applicability on 14 November 2013. The consequential amendments to Annexes 11 and 14, Volumes I and II, are also envisaged for applicability on 14 November 2013. Any comments you may have thereon would be appreciated.

9. The subsequent work of the Air Navigation Commission and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the amendment proposal.

10. Please note that, for the review of your comments by the Air Navigation Commission and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments”, or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment F which may be completed and returned together with your comments, if any, on the proposals in Attachments A, B, C, D, and E.

Accept, Sir/Madam, the assurances of my highest consideration.

Raymond Benjamin
Secretary General

Enclosures:

A — Proposed amendment to Annex 15
B — Proposed amendment to Annex 4
C — Proposed amendment to Annex 11
D — Proposed amendment to Annex 14, Volume I
E — Proposed amendment to Annex 14, Volume II
F — Response Form

ATTACHMENT A to State letter AN 2/2.3-12/52

PROPOSED AMENDMENT TO ANNEX 15

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. New text to be inserted is highlighted with grey shading.	new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

TEXT OF A PROPOSED AMENDMENT TO THE

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AERONAUTICAL INFORMATION SERVICES

ANNEX 15

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

. . .

CHAPTER 1. ~~INTRODUCTION~~ GENERAL

Note 1.— The object of the aeronautical information service (AIS) is to ensure the flow of aeronautical data and aeronautical information~~/data~~ necessary for ~~the~~ global air traffic management (ATM) system safety, regularity, economy and efficiency in an environmentally sustainable manner ~~of international air navigation~~. The role and importance of aeronautical data and aeronautical information~~/data~~ changed significantly with the implementation of area navigation (RNAV), performance-based navigation (PBN), airborne computer-based navigation systems and data link systems. Corrupt, ~~or~~ erroneous, late, or missing aeronautical data and aeronautical information~~/data~~ can potentially affect the safety of air navigation.

~~To satisfy the uniformity and consistency in the provision of aeronautical information/data that is required for the operational use by computer-based navigation systems, States shall, as far as practicable, avoid standards and procedures other than those established for international use.~~

Note 2.— These Standards and Recommended Practices are to be used in conjunction with the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (*PANS-ABC, Doc 8400*).

~~It is recognized that Supplementary Procedures may be required in certain cases in order to meet particular requirements of the ICAO Regions.~~

Note 3.— Guidance material on the organization and operation of aeronautical information services is contained in the Aeronautical Information Services Manual *(Doc 8126).*

Rationale

The title of Chapter 1 is revised to “General” and the current content is presented as a note, introductory to the Annex. The reference to “aeronautical information/data” is revised here and throughout the annex to “aeronautical data and aeronautical information” to point out the distinction between the management of data and the management of information. The statement outlining the object of AIS is revised to be in line with the global air traffic management (ATM) system requirements.

~~CHAPTER 2.~~ 1.1 ~~DEFINITIONS~~ Definitions

When the following terms are used in the Standards and Recommended Practices for aeronautical information services, they have the following meanings:

. . .

Aerodrome. A defined area on land or water (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 (AMD). Data collected for the purpose of compiling aerodrome mapping information.

Note.— Aerodrome mapping data are collected for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.

Aerodrome mapping database (AMDB). A collection of aerodrome mapping data organized and arranged as a structured data set.

. . .

Aeronautical Information Circular (AIC). 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 (AIM). 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 Publication (AIP). 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 service (AIS). A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information~~/data~~ necessary for the safety, regularity and efficiency of air navigation.

. . .

Air defence identification zone (ADIZ). Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

Air traffic management (ATM). 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 product. Aeronautical data and aeronautical information~~/data~~ provided in the form of the elements of the Integrated Aeronautical Information Package (except NOTAM and PIB), including aeronautical charts, or in the form of suitable electronic media.

. . .

Canopy. Bare Earth supplemented by vegetation height.

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

Note.— The interval is usually referred to as the accuracy of the estimate.

. . .

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

~~***Database.*** One or more files of data so structured that appropriate applications may draw from the files and update them.~~

~~*Note.— This primarily refers to data stored electronically and accessed by computer rather than in files of physical records.*~~

. . .

Human Factors principles. 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.

. . .

Integrated Aeronautical Information Package. A package in paper, electronic or digital form which consists of the following elements:

— AIP, including amendment service;

— Supplements to the AIP;

— NOTAM and PIB;

— AIC; and

— checklists and lists of valid NOTAM.

Integrity (aeronautical data). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

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

a) routine data: 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: 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: 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.

. . .

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

Metadata. Data about data (ISO 19115*).

Note.— ~~Data that describes and documents data.~~ A structured description of the content, quality, condition or other characteristics of data.

. . .

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

~~***Relief.*** The inequalities in elevation of the surface of the Earth represented on aeronautical charts by contours, hypsometric tints, shading or spot elevations.~~

Rationale
Existing definitions are clarified and new definitions are added to support to support new material in the Annex. Redundant definitions are deleted. A new definition has been added in Chapter 1 for integrity classification to define the high, low or very low probability for critical, essential or routine data, that when corrupted, would have a potential risk for catastrophe.

Editorial Note.— Former section 3.7 is moved to new Chapter 1 and renumbered section 1.2.

~~3.7~~ 1.2 Common reference systems for air navigation

~~3.7.1~~ 1.2.1 Horizontal reference system

~~3.7.1.1~~ 1.2.1.1 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

Note 1.— Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System — 1984 (WGS-84) Manual *(Doc 9674)*.

Note 2.— Specifications governing the determination and reporting (accuracy of field work and data integrity) of WGS-84-related aeronautical coordinates for geographical positions established by air traffic services are given in Annex 11, Chapter 2, and Appendix 5, Table 1, and for aerodrome/heliport-related positions, in Annex 14, Volumes I and II, Chapter 2, and Table A5-1 and Table 1 of Appendices 5 and 1, respectively.

~~3.7.1.2~~ 1.2.1.2 **Recommendation.—** *In precise geodetic applications and some air navigation applications, temporal changes in the tectonic plate motion and tidal effects on the Earth's crust should*

be modelled and estimated. To reflect the temporal effect, an epoch should be included with any set of absolute station coordinates.

Note 1.— The epoch of the WGS-84 (G873) reference frame is 1997.0 while the epoch of the latest updated WGS-84 (G1150) reference frame, which includes plate motion model, is 2001.0. (G indicates that the coordinates were obtained through Global Positioning System (GPS) techniques, and the number following G indicates the GPS week when these coordinates were implemented in the United States of America's National Geospatial-Intelligence Agency's (NGA's) precise ephemeris estimation process.)

Note 2.— The set of geodetic coordinates of globally distributed permanent GPS tracking stations for the most recent realization of the WGS-84 reference frame (WGS-84 (G1150)) is provided in Doc 9674. For each permanent GPS tracking station, the accuracy of an individually estimated position in WGS-84 (G1150) has been in the order of 1 cm (1σ).

Note 3.— Another precise worldwide terrestrial coordinate system is the International Earth Rotation Service (IERS) Terrestrial Reference System (ITRS), and the realization of ITRS is the IERS Terrestrial Reference Frame (ITRF). Guidance material regarding the ITRS is provided in Appendix C of Doc 9674. The most current realization of the WGS-84 (G1150) is referenced to the ITRF 2000 epoch. The WGS-84 (G1150) is consistent with the ITRF 2000 and in practical realization the difference between these two systems is in the one to two centimetre range worldwide, meaning WGS-84 (G1150) and ITRF 2000 are essentially identical.

~~3.7.1.3~~ 1.2.1.3 Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2, shall be identified by an asterisk.

~~3.7.1.4~~ 1.2.1.4 The order of publication resolution of geographical coordinates shall be that specified in Appendix 1 and Table A7-1 of Appendix 7 while the order of chart resolution of geographical coordinates shall be that specified in Annex 4, Appendix 6, Table 1.

~~3.7.2~~ 1.2.2 Vertical reference system

~~3.7.2.1~~ 1.2.2.1 Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system for international air navigation.

Note 1.— The geoid globally most closely approximates MSL. It is defined as the equipotential surface in the gravity field of the Earth which coincides with the undisturbed MSL extended continuously through the continents.

Note 2.— Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

~~3.7.2.2~~ 1.2.2.2 The Earth Gravitational Model — 1996 (EGM-96), containing long wavelength gravity field data to degree and order 360, shall be used by international air navigation as the global gravity model.

Note.— Guidance material concerning EGM-96 is contained in Doc 9674.

~~3.7.2.3~~ 1.2.2.3 At those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation specified in Annex 14, Volumes I and II, on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used. When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, shall be provided in the Aeronautical Information Publication (AIP).

Note.— Specifications governing determination and reporting (accuracy of field work and data integrity) of elevation and geoid undulation at specific positions at aerodromes/heliports are given in Annex 14, Volumes I and II, Chapter 2, and Table A5-2 and Table 2 of Appendices 5 and 1, respectively.

~~3.7.2.4~~ 1.2.2.4 In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions specified in Appendix 1 shall also be published.

~~3.7.2.5~~ 1.2.2.5 The order of publication resolution of elevation and geoid undulation shall be that specified in Appendix 1 and Table A7-2 of Appendix 7 while the order of chart resolution of elevation and geoid undulation shall be that specified in Annex 4, Appendix 6, Table 2.

~~3.7.3~~ 1.2.3 Temporal reference system

~~3.7.3.1~~ 1.2.3.1 For international civil aviation, the Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system.

Note 1.— A value in the time domain is a temporal position measured relative to a temporal reference system.

Note 2.— Coordinated Universal Time (UTC) is a time scale maintained by the Bureau International de l'Heure (BIH) and the IERS and forms the basis of a coordinated dissemination of standard frequencies and time signals.

Note 3.— See Attachment D of Annex 5 for guidance material relating to UTC.

Note 4.— ISO Standard 8601 specifies the use of the Gregorian calendar and 24-hour local or UTC for information interchange while ISO Standard 19108 prescribes the Gregorian calendar and UTC as the primary temporal reference system for use with geographic information.

~~3.7.3.2~~ 1.2.3.2 When a different temporal reference system is used for some applications, the feature catalogue, or the metadata associated with an application schema or a data set, as appropriate, shall include either a description of that system or a citation for a document that describes that temporal reference system.

Note.— ISO Standard 19108, Annex D, describes some aspects of calendars that may have to be considered in such a description.

Rationale

The current section 3.7 is proposed to be relocated to the new Chapter 1 and re-numbered section 1.2. This is part of the restructure of the first three chapters of Annex 15 and will allow a dedicated Chapter 3 to focus on aeronautical information management.

Editorial Note.— Former section 3.6 is moved to Chapter 1 and renumbered section 1.3

~~3.6~~ 1.3 ~~General~~ Miscellaneous specifications

~~3.6.1~~ 1.3.1 Each element of the Integrated Aeronautical Information Package for international distribution shall include English text for those parts expressed in plain language.

~~3.6.2~~ 1.3.2 Place names shall be spelt in conformity with local usage, transliterated, when necessary, into the Latin alphabet.

~~3.6.3~~1.3.3 **Recommendation.—** *Units of measurement used in the origination, processing and distribution of aeronautical data and aeronautical information~~/data~~ should be consistent with the decision taken by the State in respect of the use of the tables contained in Annex 5* — Units of Measurement to be Used in Air and Ground Operations.

~~3.6.4 Use of ICAO abbreviations~~

1.3.4 ICAO abbreviations shall be used in the aeronautical information services whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information~~/data~~.

Rationale

The current section 3.6 is proposed to be relocated to the new chapter 1 and re-numbered section 1.3. This is part of the restructure of the first three chapters of Annex 15 and will allow a dedicated chapter 3 to focus on aeronautical information management.

Paragraph 1.3.3 is revised to include the use of units of measurement for the origination and processing of aeronautical data and aeronautical information to support information management from origin to end use.

CHAPTER ~~3~~ 2. ~~GENERAL~~ RESPONSIBILITIES AND FUNCTIONS

~~3.1~~2.1 State ~~R~~responsibilities ~~and functions~~

~~3.1.1~~ 2.1.1 Each Contracting State shall:

a) provide an aeronautical information service; or

b) agree with one or more other Contracting State(s) for the provision of a joint service; or

c) delegate the authority for the provision of the service to a non-governmental agency, provided the Standards and Recommended Practices of this annex are adequately met.

2.1.2 Each Contracting State shall ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of air traffic services.

~~3.1.1.1~~ 2.1.3 The State concerned shall remain responsible for the aeronautical data and aeronautical information provided ~~published~~. Aeronautical data and aeronautical information provided ~~published~~ for and on behalf of a State shall clearly indicate that it is provided ~~published~~ under the authority of that State.

~~3.1.1.2~~2.1.4 Each Contracting State shall ~~take all necessary measures to~~ ensure that the aeronautical data and aeronautical information~~/data it provided relating to its~~ is complete, timely and of ~~the~~ required quality in accordance with 3.3. ~~own territory, as well as areas in which the State is responsible for air traffic services outside its territory is adequate, of required quality and timely. This shall include arrangements for the timely provision of required information/data to the aeronautical information service by each of the State services associated with aircraft operations.~~

Editorial Note.— The last sentence of former 3.1.1.2, above, is incorporated into the following new 2.1.5.

2.1.5 Each contracting State shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information and the aeronautical information service in relation to the timely and complete provision of aeronautical data and aeronautical information.

2.2 AIS responsibilities and functions

~~3.1.6~~ 2.2.1 An aeronautical information service shall ensure that aeronautical data and aeronautical information~~/data~~ necessary for the safety, regularity or efficiency of air navigation is made available in a form suitable for the operational requirements of the ATM community, including:

a) those involved in flight operations, including flight crews, flight planning and flight simulators; and

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

~~3.1.7~~ 2.2.2 An aeronautical information service shall receive ~~and/or originate~~, collate or assemble, edit, format, publish/store and distribute aeronautical data and aeronautical information~~/data~~ concerning the entire territory of the State as well as those areas over the high seas in which the State is responsible for the provision of air traffic services ~~outside its territory~~. Aeronautical data and aeronautical information shall be ~~published~~ provided as an Integrated Aeronautical Information Package.

Note.— An Aeronautical Information Service may include origination functions.

~~3.1.1.3~~ 2.2.3 Where 24-hour service is not provided, service shall be available during the whole period an aircraft is in flight in the area of responsibility of an aeronautical information service, plus a period of at least two hours before and after such a period. The service shall also be available at such other time as may be requested by an appropriate ground organization.

~~3.1.2~~ 2.2.4 An aeronautical information service shall, in addition, obtain aeronautical data and aeronautical information to enable it to provide pre-flight information service and to meet the need for in-flight information.

a) from the aeronautical information services of other States;

b) from other sources that may be available.

Note. — One such source is the subject of a provision in 8.3.

~~3.1.3~~ 2.2.5 Aeronautical data and aeronautical information~~/data~~ obtained under 2.2.4 ~~3.1.2~~ a) shall, when distributed, be clearly identified as having the authority of the State of Origin.

~~3.1.4~~ 2.2.6 Aeronautical data and aeronautical information~~/data~~ obtained under 2.2.4 ~~3.1.2~~ b) shall, if possible, be verified before distribution and if not verified shall, when distributed, be clearly identified as such.

~~3.1.5~~ 2.2.7 An aeronautical information service shall promptly make available to the aeronautical information services of other States any aeronautical data and aeronautical information~~/data~~ necessary for the safety, regularity or efficiency of air navigation required by them, to enable them to comply with ~~3.1.6 below~~ 2.2.1.

Editorial Note.— The original 3.1.6 and 3.1.7 renumbered 2.2.1 and 2.2.2. Section 3.2 on Quality management system moved to new 3.7.

~~3.3~~ 2.3 Exchange of aeronautical data and aeronautical information~~/data~~

~~3.3.1~~ 2.3.1 Each State shall designate the office to which all elements of the Integrated Aeronautical Information Package originated by other States shall be addressed. Such an office shall be qualified to deal with requests for aeronautical data and aeronautical information~~/data~~ originated by other States.

~~3.3.2~~ 2.3.2 Where ~~a State designates~~ more than one international NOTAM office is designated within a State, ~~it shall define~~ the extent of responsibility and the territory covered by each office shall be defined.

~~3.3.3~~ 2.3.3 An aeronautical information service shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.

~~3.3.4~~ 2.3.4 ~~States shall,~~ ~~w~~Wherever practicable, ~~establish~~ direct contact between aeronautical information services shall be established in order to facilitate the international exchange of aeronautical data and aeronautical information~~/data~~.

~~3.3.5~~ 2.3.5 One copy of each of the elements of the Integrated Aeronautical Information Package~~, in paper, or electronic form or both,~~ that have been requested by the aeronautical information service of an ICAO Contracting State shall be made available by the originating State in the mutually-agreed form(s), without charge, even where authority for publication/storage and distribution has been delegated to a ~~commercial agency~~ non-governmental agency.

~~3.3.6~~ 2.3.6 **Recommendation.—** *The exchange of more than one copy of the elements of the Integrated Aeronautical Information Package and other air navigation documents, including those containing air navigation legislation and regulations~~, whether in paper and/or electronic form~~, should be subject to bilateral agreement between ICAO Contracting States.*

~~3.3.7~~ 2.3.7 **Recommendation.—** *The procurement of aeronautical data and aeronautical information~~/data~~, including the elements of the Integrated Aeronautical Information Package, and other air navigation documents, including those containing air navigation legislation and regulations, ~~whether~~*

~~in paper and/or electronic form,~~ by States other than ICAO Contracting States and by other entities should be subject to separate agreement with the originating State.

~~3.4~~ 2.4 Copyright

Note.— In order to protect the investment in the products of a State's AIS as well as to ensure better control of their use, States may wish to apply copyright to those products in accordance with their national laws.

2.4.1 Any product of a State's AIS which has been granted copyright protection by that State and provided to another State in accordance with ~~3.3~~ 2.3 shall only be made available to a third party on the condition that the third party is made aware that the product is copyright protected and provided that it is appropriately annotated that the product is subject to copyright by the originating State.

~~3.5~~ 2.5 Cost recovery

2.5.1 **Recommendation.—** *The overhead cost of collecting and compiling aeronautical data and aeronautical information~~/data~~ should be included in the cost basis for airport and air navigation services charges, as appropriate, in accordance with the principles contained in* ICAO's Policies on Charges for Airports and Air Navigation Services *(Doc 9082).*

Note.— When costs of collection and compilation of aeronautical data and aeronautical information~~/data~~ are recovered through airports and air navigation services charges, the charge to an individual customer for the supply of a particular AIS product~~, either in paper or electronic form,~~ may be based on the costs of printing paper copies, ~~or~~ production of electronic media, and costs of distribution.

Rationale

Chapter 2 is re-titled to specify responsibilities and functions. SARPs taken from the original Chapter 3 are better organized to separate and clarify specific State responsibilities in Section 2.1 from AIS responsibilities and functions provided in section 2.2. Related responsibilities and functions concerning the exchange of aeronautical data and aeronautical information, copyright, and cost recovery are included in the chapter under separate sections.

CHAPTER 3. AERONAUTICAL INFORMATION MANAGEMENT

Editorial Note.— The original sections 3.1, 3.3, 3.4 and 3.5 have been moved to Chapter 2. Parts of original section 3.6 and all of 3.7 moved to Chapter 1.

Rationale

The original Chapter 3 is re-organized as a new chapter on aeronautical information management. The applicable elements from the original Chapter 3 pertaining to responsibilities and functions have been moved to Chapter 2 while the remaining elements are moved and revised to correctly align and specify aeronautical information management performance requirements along with the quality management system and human factors specifications.

3.1 Information management requirements

3.1.1 Information management resources and processes shall ensure the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the ATM system.

3.2 Aeronautical data and aeronautical information validation and verification

~~3.2.13~~ 3.2.1 Material to be issued as part of the Integrated Aeronautical Information Package shall be thoroughly checked ~~and coordinated with the services responsible~~ before it is submitted to the aeronautical information service, in order to make certain that all necessary information has been included and that it is correct in detail prior to distribution. ~~Validation and verification procedures shall be established which ensure that quality requirements (accuracy, resolution, integrity) and traceability requirements of aeronautical data are met.~~

3.2.2 An Aeronautical Information Service shall establish, validation and verification procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements (accuracy, resolution, integrity) and traceability requirements are met.

Note 1.— Guidance material on the liaison with other related services is contained in Doc 8126.

Note 2.— Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, ~~protection~~ and traceability~~)~~ and protection requirements ~~is contained~~ may be found in the World Geodetic System — 1984 (WGS-84) Manual *(Doc 9674). Supporting data quality material in respect of data accuracy, ~~the provisions of Appendices 1 and 7 related to~~ publication resolution, and integrity of aeronautical data together with guidance material in respect to the rounding convention for aeronautical data is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77 —* Industry Requirements for Aeronautical Information (or equivalent).

Editorial Note.— Note 2 above is from paragraph 3.2.14.

Note 3.— Guidance material on the management of aeronautical data quality is included in the Manual on the Quality Management System for Aeronautical Information Services *(Doc 9839).*

Rationale

Section 3.2 is drawn in part from original paragraph 3.2.13 to provide performance requirements for the verification and validation of the aeronautical information and aeronautical data received. The data quality requirements (accuracy, resolution, integrity) along with traceability and protection requirements are further supported with reference to the necessary guidance materials drawn from the original note under paragraph 3.2.14.

A significant number of aeronautical data is being published in excess of ICAO requirements for publication resolution. This in itself does not cause any safety issue; however, when this data is processed by the various automated systems requiring lower resolution, different methods for rounding aeronautical data may cause the data to be altered in different segments of the aeronautical data process chain. With the increasing number of automated aeronautical data processing systems, reference to a common rounding convention is needed to avoid any possibility for aeronautical data alteration.

3.3 Data quality specifications

3.3.1 Accuracy

~~3.2.8~~ 3.3.1.1 The order of accuracy for aeronautical data~~, based upon a 95 per cent confidence level,~~ shall be as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points).

Note.— The accuracy requirements for electronic terrain and obstacle data are specified in Appendix 8.

3.3.2 Resolution

~~3.2.9~~ 3.3.2.1 The order of publication resolution of aeronautical data shall be that as specified in Appendices 1 and 7.

3.3.2.2 **Recommendation.—** *The resolution of the data features contained in the database should be commensurate with the data accuracy requirements.*

Note 1.— The resolution of the data features contained in the database may be finer than the publication resolution.

3.3.3 Integrity

~~3.2.11~~ 3.3.3.1 Aeronautical data quality requirements related to integrity classification ~~and data integrity~~ shall be as provided in Tables A7-1 to A7-5 of Appendix 7.

~~3.2.10~~ 3.3.3.2 The integrity of aeronautical data shall be maintained throughout the data process from survey/origin to distribution to the next intended user (the entity that receives the aeronautical information from the aeronautical information service provider). ~~Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply~~ Based on the applicable integrity classification~~s~~, the validation and verification procedures shall:

~~a) critical data, integrity level 1×10^{-8}: 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; (3.2.10 a))~~

~~b) essential data, integrity level 1×10^{-5}: 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 (3.2.10 b))~~

~~c) routine data, integrity level 1×10^{-3}: 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. (3.2.10 c))~~

a) For routine data: avoid corruption throughout the processing of the data;

b) For essential data: assure corruption does not occur at any stage of the entire process and may

include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

c) For critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note 1.— Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

Note 2.— Error producing faults in the entire process may be mitigated by additional data integrity assurance techniques as may be required. These could include application tests for critical data (for example, by flight check); the use of security, logic, semantic, comparison, and redundancy checks; digital error detection; and the qualification of human resources and process tools such as hardware and software.

Note ~~1~~3.— Distribution to the next intended user will differ in the delivery method applied which may either be:

Physical distribution. The means by which aeronautical data and aeronautical information~~/data~~ distribution is achieved through the delivery of a physical package, such as postal services;

or

Direct electronic distribution. The means by which aeronautical data and aeronautical information~~/data~~ distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.

Note ~~2~~4.— Different delivery methods and data media may require different procedures to ensure the required data quality.

Rationale

Subsection 3.3.2 Resolution is revised by the addition of a note to clarify that the database resolution should be commensurate with the data accuracy requirements (which may require an appropriate resolution to fulfil the requirements for all applications in the system) and may differ from the publication resolution (which may differ depending on the publication resolution for a specific use.)

The specification of numeric values associated with integrity classifications has proven problematic to prove compliance. To provide for an achievable means of compliance, the original paragraph 3.2.10 is revised and renumbered 3.3.3.2 to specify the requirements for validation and verification procedures for critical, essential and routine data to assure the integrity required.

~~3.8~~ 3.4 Metadata

~~3.8.1~~ 3.4.1 Metadata shall be collected for aeronautical data processes and exchange points. This metadata collection shall be applied throughout the aeronautical information data chain, from survey/origin to distribution to the next intended user.

Note.— ISO Standard 19115 specifies requirements for geographic information metadata

~~3.8.2~~ 3.4.2 The metadata to be collected shall include, as a minimum:

a) the name of the organizations or ~~entity~~ entities performing ~~the function~~ any action of originating, transmitting or manipulating the data;

b) the action ~~function~~ performed; and

c) the date and time ~~of operation.~~ the action was performed.

~~*Note.— The function performed indicates any action of originating, transmitting or manipulating the data.*~~

Rationale

The original section 3.8 Metadata is moved to section 3.4. Paragraph 3.8.1 renumbered as 3.4.1 is revised to provide a note for reference to ISO Standard 19115 as guidance material. Paragraph 3.8.2 is renumbered as 3.4.2 and the reference to "function" in 3.4.2 a) is replaced by the content of the note to provide a more correct and direct reference to the action of originating, transmitting or manipulating the data. In the same manner, for consistency and clarity, the term "action" replaces "function" in 3.4.2 b) and "operation" in 3.4.2 c). The clarification here is that a function is generally an assigned duty or activity while an action is the process of doing something. Thus the metadata collected would allow for traceability of each of the actions taken in the data chain.

3.5 Data protection

3.5.1 Aeronautical data shall be protected in accordance with data error detection, security, and authentication techniques.

Note.— The Aeronautical Information Services Manual *(Doc 8126) contains suitable guidance on data error detection, security, and authentication techniques.*

~~3.2.12~~ 3.5.2 Electronic aeronautical data sets shall be protected by the inclusion in the data sets of a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. This shall apply to the protection of all integrity levels of data sets as specified in ~~3.2.10~~ 3.3.3.

Note 1.— This requirement does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

Rationale

The original paragraph 3.2.12 concerning cyclic redundancy check (CRC) for data protection is moved to a new section 3.5 Data protection. New paragraph 3.5.1 is added to provide for broader protection in the form of data error detection, security, and authentication techniques to cover the entire data transfer chain.

~~3.6.5~~ 3.6 Use of automation

3.6.1 **~~Recommendation.~~** Automation *~~enabling digital data exchange should~~* shall be introduced with the objective of improving the timeliness ~~speed~~, quality, efficiency and cost-effectiveness of aeronautical information services.

3.6.2 Where aeronautical data and aeronautical information are provided in multiple formats, processes shall be implemented to ensure data and information consistency between formats.

3.6.3 In order to meet the data quality requirements, automation shall:

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

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

Note.— Guidance ~~material~~ on the aeronautical ~~conceptual~~information and data exchange models ~~for the development of databases and the establishment of data exchange services is contained~~ may be found in the Aeronautical Information Services Manual (*Doc 8126).*

3.6.4 **Recommendation**.— *The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.*

3.6.5 **Recommendation.—** *The aeronautical information model used should:*

a) use the Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations, and data types;

b) include data value constraints and data verification rules;

c) include provisions for metadata as specified in section 3.4.2; and

d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.

3.6.6 **Recommendation.—** *The aeronautical data exchange model used should:*

a) apply a commonly used data encoding format;

b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in paragraph 3.6.5; and

c) provide an extension mechanism, by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.

Rationale

Original section 3.6.5 Use of automation section renumbered as 3.6 is revised from a recommendation to a standard in new paragraph 3.6.1. New paragraphs are added to address consistency in the formats for delivery and provide performance requirements to enable digital data exchange and the use of aeronautical information and data exchange models to be globally interoperable. Recommendations are provided concerning the performance requirements for the aeronautical information model used and the aeronautical data exchange model that should be used.

Editorial Note.— Section 3.6.6 to be relocated to Annex 11.

~~3.6.6 Identification and delineation of prohibited, restricted and danger areas~~

~~3.6.6.1 Each prohibited area, restricted area, or danger area established by a State shall, upon initial establishment, be given an identification and full details shall be promulgated (see ENR 5.1 of Appendix 1).~~

~~3.6.6.2 The identification so assigned shall be used to identify the area in all subsequent notifications pertaining to that area.~~

~~3.6.6.3 The identification shall be composed of a group of letters and figures as follows:~~

~~a) nationality letters for location indicators assigned to the State or territory which has established the airspace;~~

~~b) a letter P for prohibited area, R for restricted area and D for danger area as appropriate;~~

~~c) a number, unduplicated within the State or territory concerned.~~

~~*Note. — Nationality letters are those contained in* Location Indicators *(Doc 7910).*~~

~~3.6.6.4 To avoid confusion, identification numbers shall not be reused for a period of at least one year after cancellation of the area to which they refer.~~

~~3.6.6.5 **Recommendation.** — *When a prohibited, restricted or danger area is established, the area should be as small as practicable and be contained within simple geometrical limits, so as to permit ease of reference by all concerned.*~~

Rationale

The original section 3.6.6, *Identification and delineation of prohibited, restricted and danger areas* is recommended to be moved to Annex 11 since the SARPs therein do not pertain to aeronautical information services but rather to airspace management.

~~3.2~~ 3.7 Quality management system

~~3.2.1~~ 3.7.1 Quality management systems shall be implemented and maintained encompassing all functions of an aeronautical information service, as outlined in ~~3.1.7~~ 2.2. The execution of such quality management systems shall be made demonstrable for each function stage~~, when required~~.

Note.— Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (*Doc 9839*).

~~3.2.2~~ 3.7.2 **Recommendation.**— *Quality management should be 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.*

Note 1.— Quality management may be provided by a single quality management system or serial quality management systems.

Note 2.— Letters of agreement concerning data quality between originator and distributor and between distributor and next intended user may be used to manage the aeronautical information data chain.

3.7.3 ~~3.2.3~~ **Recommendation.—** *The quality management system established in accordance with 3.7.1 ~~3.2.1~~ should follow the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and be certified by an approved organization.*

Note 1.— An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.

Note 2.— International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme and define the term "accredited certification body". The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization.

Note 3.— Supporting material in respect of the processing of aeronautical data is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data. *These standards support the development and application of aeronautical databases.*

~~3.2.4~~ 3.7.4 Within the context of the established quality management system, the competencies ~~skills~~ and the associated knowledge, skills and abilities required for each function shall be identified, and personnel assigned to perform those functions shall be appropriately trained. ~~States shall~~ Processes shall be in place to ensure that personnel possess the ~~skills and~~ competencies required to perform specific assigned functions. ~~and a~~ Appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required ~~skills and~~ competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

Note.— Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (*Doc 9991*).

~~3.2.5~~ 3.7.5 Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data is traceable throughout the aeronautical information data chain so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.

~~3.2.6~~ 3.7.6 The established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information~~/data~~ satisfy the aeronautical data quality requirements for accuracy, resolution and integrity as specified in 3.2 and 3.3 ~~Appendix 7~~, and that the data traceability requirements are met through the provision of appropriate metadata as specified in 3.4 ~~3.8.1~~. The system shall also provide assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.

~~3.2.7~~ 3.7.7 All necessary measures shall be taken to monitor compliance with the quality management system in place.

Editorial Note.— Paragraph 3.2.8 is moved to 3.3.1, paragraph 3.2.9 is moved to 3.3.2 and the first sentence of paragraph 3.2.10 is moved to 3.3.3.2. The second sentence with a), b) and c) has been revised as a new definition: ***Integrity classification (aeronautical data),*** paragraph 3.2.11 is moved to 3.3.3.1, paragraph 3.2.11 is incorporated and replaced by new paragraph 3.5, paragraph 3.2.13 revised and moved to 3.2.1.

. . .

~~3.2.14~~ 3.7.8 Demonstration of compliance of the quality management system applied shall be by audit. If nonconformity is identified, initiating action to correct its cause shall be determined and taken without undue delay. All audit observations and remedial actions shall be evidenced and properly documented.

~~*Note.— Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, protection and traceability) is contained in the* World Geodetic System — 1984 (WGS-84) Manual *(Doc 9674). Supporting material in respect of the provisions of Appendices 1 and 7 related to publication resolution and integrity of aeronautical data is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77* Industry Requirements for Aeronautical Information.~~

Rationale

Original section 3.2 Quality management system is moved to section 3.7 and revised to move the pertinent data quality performance requirements to the new sections 3.2 Aeronautical information and aeronautical data validation and verification and 3.3 Data quality specifications. Only those performance requirements pertinent to the quality management system are retained in section 3.7.

~~3.6.7~~ 3.8 Human Factors considerations

~~3.6.7.1~~ 3.8.1 The organization of the aeronautical information services as well as the design, contents, processing and distribution of aeronautical data and aeronautical information~~/data~~ shall take into consideration Human Factors principles which facilitate their optimum utilization.

~~3.6.7.2~~ 3.8.2 Due consideration shall be given to the integrity of information where human interaction is required and mitigating steps taken where risks are identified.

Note.— This may be accomplished through the design of systems, through operating procedures or through improvements in the operating environment.

Rationale

“Aeronautical information/data” is replaced by “Aeronautical data and aeronautical information” in accordance with a global change throughout the annex.

CHAPTER 4. AERONAUTICAL INFORMATION PUBLICATIONS (AIP)

. . .

4.2.7 All changes to the AIP, or new information on a ~~reprinted~~ republished page, shall be identified by a distinctive symbol or annotation.

. . .

4.3.7 When an AIP Amendment will not be published at the established interval or publication date, a NIL notification shall be originated and distributed by the monthly ~~printed~~ plain-language list of valid NOTAM required by 5.2.13.3.

. . .

4.4.6 A checklist of valid AIP Supplements shall be issued at intervals of not more than one month. This information shall be issued through the medium of the monthly ~~printed~~ plain-language list of valid NOTAM required by 5.2.13.3.

Rationale

In paragraph 4.2.7 "reprinted" is revised to "republished" to allow for provision in formats other than in print. In a similar manner, to avoid limitations to only printed materials, paragraphs 4.3.7 and 4.4.6 are revised to delete "printed" for plain-language list of valid NOTAM.

CHAPTER 5. NOTAM

. . .

5.2.13.3 A monthly ~~printed~~ plain-language list of valid NOTAM, including indications of the latest AIP Amendments, AIC issued and a checklist of AIP Supplements, shall be prepared with a minimum of delay and forwarded by the most expeditious means to recipients of the Integrated Aeronautical Information Package.

Rationale

Paragraph 5.2.13.3 is revised to remove the indication of a "printed" plain-language list since these may also be made available in other formats.

CHAPTER 6. AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)

. . .

6.2 Provision of information in paper copy form

6.2.1 ~~In all instances, i~~Information provided under the AIRAC system ~~shall be published~~ in paper copy form ~~and~~ shall be distributed by the AIS unit at least 42 days in advance of the effective date with the objective of reaching recipients at least 28 days in advance of the effective date.

. . .

6.3 Provision of information ~~in~~ as electronic ~~form~~ media

6.3.1 States that have established an aeronautical database shall, when updating its contents concerning the circumstances listed in Appendix 4, Part 1, ensure that the effective dates of data coincide with the established AIRAC effective dates ~~used for the provision of information in paper copy form~~.

6.3.2 Information provided ~~in~~ as electronic media ~~form~~, concerning the circumstances listed in Appendix 4, Part 1, shall be distributed/made available by the AIS unit so as to reach recipients at least 28 days in advance of the AIRAC effective date.

6.3.3 **Recommendation.—** *Whenever major changes are planned and where advance notice is desirable and practicable, information provided ~~in~~ as electronic ~~form~~ media should be distributed/made available at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.*

Note.— Guidance on what constitutes a major change is included in Doc 8126.

Rationale

Paragraph 6.2.1 is revised to be applicable to those AIRAC provided in paper form and distributed by post.

The replacement of the term “electronic form” with “electronic media” is intended to provide clarity and consistency with the use of the term “electronic” media in other parts of the Annex. Electronic media is a term that encompasses information and content that is transmitted and available to be accessed through electronic means. This contrasts with print media, which is printed out and does not need electronic access but may have been created electronically.

CHAPTER 7. AERONAUTICAL INFORMATION CIRCULARS (AIC)

. . .

7.2 General specifications

~~7.2.1 AIC shall be issued in printed form.~~
~~*Note.— Both text and diagrams may be included.*~~

7.2.1~~.1~~ The originating ~~State~~ aeronautical information service shall select the AIC that are to be given international distribution.

7.2.~~1~~.2 Each AIC shall be allocated a serial number which shall be consecutive and based on the calendar year.

7.2.~~1~~.3 When AIC are distributed in more than one series, each series shall be separately identified by a letter.

Note.— Both text and diagrams may be included in an AIC.

Editorial Note.— Note in original 7.2.1 relocated above and amended as indicated.

7.2.~~1.~~4 **Recommendation.—** *Differentiation and identification of AIC topics according to subjects using colour coding should be practised where the numbers of AIC in force are sufficient to make identification in this form necessary.*

Note.— Guidance on colour coding of AIC by subject can be found in the Aeronautical Information Services Manual *(Doc 8126).*

7.2.~~2~~5 A checklist of AIC currently in force shall be issued at least once a year, with distribution as for the AIC.

Rationale

Paragraph 7.2.1 is deleted since AIC are now also available in other formats and should not be limited to printed form. The first note is revised to add "in an AIC" to provide for clarity and to complete the statement and relocated under 7.2.3.

CHAPTER 8. PRE-FLIGHT AND POST-FLIGHT INFORMATION~~/DATA~~

. . .

8.1.3 A recapitulation of current NOTAM of operational significance and other information of urgent character shall be made available to flight crews in the form of plain-language pre-flight information bulletins (PIB).

Note.— Guidance on the preparation of PIB is contained in the Aeronautical Information Services Manual *(Doc 8126).*

8.2 Automated ~~aeronautical~~ pre-flight information systems

8.2.1 ~~The civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) shall use~~ a~~a~~Automated pre-flight information systems shall be used to make aeronautical data and aeronautical information~~/data~~ available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes. The aeronautical data and aeronautical information~~/data~~ made available shall comply with the provisions of 8.1.2 and 8.1.3.

. . .

8.2.3 Automated pre-flight information systems for the supply of aeronautical data and aeronautical information~~/data~~ for self-briefing, flight planning and flight information service shall:

a) provide 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, aeronautical personnel concerned and other aeronautical users through suitable telecommunications means;

c) ensure provision, in paper copy form, of the aeronautical data and aeronautical information~~/data~~ accessed, as required;

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 operator concerned; and

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

Note.— ICAO abbreviations and codes and location indicators are given respectively in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (*PANS-ABC, Doc 8400*) *and* Location Indicators (*Doc 7910*).

8.2.4 **Recommendation.**— *Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with 8.2.1 and meteorological information in accordance with 9.~~5~~4.1 of Annex 3 — Meteorological Service for International Air Navigation, should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with ~~3~~2.1.1 c) and the relevant meteorological authority.*

8.2.5 Where automated pre-flight information systems are used to provide the harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information/ data and meteorological information, the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with ~~3~~2.1.1 c) shall remain responsible for the quality and timeliness of the aeronautical data and aeronautical information~~/data~~ provided by means of such a system.

Note.— The meteorological authority concerned remains responsible for the quality of the meteorological information provided by means of such a system in accordance with ~~9.5.1~~ 9.4.3 of Annex 3.

. . .

8.3.1 ~~States shall ensure that~~ ~~a~~Arrangements ~~are~~ shall be made to receive at aerodromes/heliports information concerning the state and operation of air navigation facilities or services noted by aircrews and shall ensure that such information is made available to the aeronautical information service for such distribution as the circumstances necessitate.

8.3.2 ~~States shall ensure that~~ ~~a~~Arrangements ~~are~~ shall be made to receive at aerodromes/heliports information concerning the presence of birds observed by aircrews and shall ensure that such information is made available to the aeronautical information service for such distribution as the circumstances necessitate.

Rationale

The title of Section 8.2 is corrected to "Automated pre-flight information systems" to be in line with the subject and purpose of Chapter 8.

Paragraph 8.2.1 is revised to delete the redundant reference to the responsible entity since Annex 15 is addressed as a whole to States who are responsible and who may delegate the authority.

CHAPTER 10. ELECTRONIC TERRAIN AND OBSTACLE DATA

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10.1.5 From 12 November 2015, at aerodromes regularly used by international civil aviation, electronic terrain data shall be provided for:

a) Area 2a;

b) The take-off flight path area; and

c) An area bounded by the lateral extents of the aerodrome obstacle limitation surfaces.

10.1.~~5~~6 From 12 November 2015, at aerodromes regularly used by international civil aviation, electronic ~~terrain and~~ obstacle data shall be provided for:

a) Area 2a , for those obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 8;

b) ~~penetrations of the take-off flight path area obstacle identification surfaces~~ Objects in the take-off flight path area 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.

Note.— Take-off flight path areas ~~obstacle identification surfaces~~ are specified in Annex 4, 3.8.2. Aerodrome obstacle limitation surfaces are specified in Annex 14, Volume 1, Chapter 4.

10.1.~~6~~7 **Recommendation.**— *At aerodromes regularly used by international civil aviation, electronic terrain and obstacle data should be provided for Areas 2b, 2c and 2d for obstacles and terrain that penetrate the relevant terrain and obstacle data collection surface specified in Appendix 8, except that data need not be collected for obstacles less than a height of 3 m above ground in Area 2b and less than a height of 15 m above ground in Area 2c.*

10.1.~~7~~8 **Recommendation.**— *At aerodromes regularly used by international civil aviation, electronic terrain and obstacle data should be provided for Area 3 for terrain and obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 8, Figure A8-3.*

Editorial Note.— Remainder of section 10.1 from paragraph 10.1.8 to 10.1.11 renumbered 10.1.9 to 10.1.12.

Rationale

The proposed revisions to Chapter 10 and Appendix 8 are limited to simple changes that do not fundamentally change the current requirements that have already been subject to extensive coordination. The purpose is to remove ambiguities by separating the standards for obstacle data and terrain data in paragraph 10.1.5 into two paragraphs and by clarifying the areas of applicability in other paragraphs and in Appendix 8.

Editorial Note.— Insert new Chapter as follows:

CHAPTER 11. AERODROME MAPPING DATA

Note 1.— Aerodrome mapping data include aerodrome geographic information that support applications which improve the user's situational awareness or supplements surface navigation, thereby increasing safety margins and operational efficiency. Aerodrome mapping data sets with appropriate data element accuracy support requirements for collaborative decision making, common situational awareness, and aerodrome guidance applications are intended to be used, among others, in the following air navigation applications:

a) Position and route awareness including moving maps with own ship position, surface guidance and navigation (such as A-SMGCS);

b) traffic awareness including surveillance and runway incursion detection and alerting;

c) facilitation of aerodrome related aeronautical information, including NOTAMs

d) resource and aerodrome facility management and

e) aeronautical chart production.

The data may also be used in other applications such as training / flight simulator and synthetic vision systems.

Note 2.— Aerodrome mapping data is organized and arranged in aerodrome mapping databases (AMDBs) for ease of electronic storage and usage by appropriate applications.

11.1 Aerodrome mapping data — requirements for provision

11.1.1 **Recommendation.**— *Aerodrome mapping data should be supported by electronic terrain and obstacle data for Area 3 in order to ensure consistency and quality of all geographical data related to the aerodrome.*

Note 1.— Accuracy and integrity requirements for aerodrome mapping data are contained in Annex 14, Volume I, Appendix 5.

Note 2.— Electronic terrain and obstacle data pertaining to Area 3 and aerodrome mapping data may be originated using common acquisition techniques and managed within a single geographic information system (GIS).

Note 3.— Supporting material in respect to the processing of electronic terrain and obstacle data and aerodrome mapping data is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

11.2 Aerodrome mapping data product specification

11.2.1 The ISO 19100 series of standards for geographic information shall be used as a reference framework.

Note — This is intended to facilitate and support the use and exchange of aerodrome mapping data between data providers and data users.

11.2.2 Aerodrome mapping data products shall be described following the ISO 19131 data product specification standard.

Note. — This includes an overview, specification scope, data product identification, data content and structure, reference system, data quality, data capture, data maintenance, data portrayal, data product delivery, additional information, and metadata.

11.3 Aerodrome mapping database — data set content and structure

11.3.1 The content and structure of aerodrome mapping data sets shall be defined in terms of an application schema and a feature catalogue.

Note. — ISO Standard 19109 contains rules for application schema while ISO Standard 19110 describes the feature cataloguing methodology for geographic information.

11.3.2 Aerodrome mapping data sets shall contain aerodrome mapping data consisting of aerodrome features.

Note 1. — Aerodrome features consist of attributes and geometries, which are characterized as points, lines or polygons. Examples include runway thresholds, taxiway guidance lines and parking stand areas.

Note 2. — Aerodrome mapping data feature definitions, constraints and rules Applicable to aerodrome mapping data are contained in RTCA Document DO-272A / European Organization for Civil Aviation Equipment (EUROCAE) Document ED-99A — User Requirements for Aerodrome Mapping Information. *These constraints ensure the connectivity between features on a spatial and functional level in accordance with the connections observed in the real world.*

Note 3. — An application schema applicable to Aerodrome mapping data feature definitions may be found RTCA Document DO-291 and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-119 — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data *This application schema contains a feature catalogue which specifies the feature types and associated attributes.*

11.3.3 Aerodrome mapping metadata shall comply with ISO 19115.

Note 1. — Metadata elements applicable to Aerodrome mapping data are contained in RTCA Document DO-291and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-119 — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data.

Rationale

Chapter 11, Aerodrome Mapping Data is added to support applications that improve situational awareness or supplement surface navigation and thereby provide safety and operational benefits.

APPENDIX 1. CONTENTS OF AERONAUTICAL INFORMATION PUBLICATION (AIP)

(see Chapter 4)

PART 1 — GENERAL (GEN)

When the AIP is produced as one volume, the Preface, Record of Amendments, Record of Supplements, Checklist of AIP pages and List of current hand amendments appear only in Part 1 – GEN and the annotation 'not applicable' must be entered against each of these subsections in Parts 2 and 3.

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments must be included in each volume.

GEN 0.1 Preface

Brief description of the Aeronautical Information Publication (AIP), including:

1) name of the publishing authority;

2) applicable ICAO documents;

3) publication media (i.e. printed, online or other electronic media)

4) ~~3)~~ the AIP structure and established regular amendment interval; ~~and~~

5) copyright policy, if applicable; and

6) ~~4)~~ service to contact in case of detected AIP errors or omissions.

. . .

GEN 2.1.3 Horizontal reference system

Brief description of the horizontal (geodetic) reference system used, including:

1) name/designation of the reference system;

2) identification and parameters of the projection;

3) identification of the ellipsoid used;

4) identification of the datum used;

5) area(s) of application; and

6) an explanation, if applicable, of the asterisk used to identify those coordinates that do not meet Annex 11 and 14 accuracy requirements.

. . .

GEN 2.2 Abbreviations used in AIS publications

A list of alphabetically arranged abbreviations and their respective significations used by the State in its AIP and in the distribution of aeronautical data and aeronautical information ~~/data~~ with appropriate annotation for those national abbreviations that are different from those contained in the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400).

Note.— A list of alphabetically arranged definitions/glossary of terms may also be added.

. . .

GEN 2.6 Conversions ~~tables~~ of units of measurement

Tables for conversion or alternately conversion formulae between:

1) nautical miles and kilometres and vice versa;

2) feet and metres and vice versa;

3) decimal minutes of arc and seconds of arc and vice versa; and

4) other conversions ~~tables,~~ as appropriate.

GEN 2.7 Sunrise/sunset ~~tables~~

Information on the time of sunrise and sunset including a ~~B~~brief description of criteria used for determination of the times given ~~in the sunrise/sunset tables, together with an~~ and either a simple formulae or table from which times may be calculated for any location within its territory/area of responsibility, or an alphabetical list of locations for which the times are given in a table with a reference to the related page in the table and the sunrise/sunset tables for the selected stations/locations, including:

. . .

GEN 3.4.5 Miscellaneous

Any additional information (e.g. selected radio broadcasting stations, telecommunications diagram).

. . .

GEN 3.6.2 Area of responsibility

Brief description of area of responsibility within which search and rescue services are provided.

Note.— A chart may be included to supplement the description of the area.

Rationale
Changes to the AIP template are proposed to update the scope of information provided and to ensure that the information can be located in a consistent fashion.

PART 2 — EN-ROUTE (ENR)

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments must be included in each volume. In the case of an AIP being published as one volume, the annotation "not applicable" must be entered against each of the above subsections.

~~Reference must be made in the appropriate subsection to indicate that differences between national regulations and ICAO SARPs and procedures exist and that they are detailed in GEN 1.7.~~

ENR 1. GENERAL RULES AND PROCEDURES

. . .

ENR 1.4 ATS airspace classification and description

ENR 1.4.1 ATS airspaces classification

The description of ATS airspace classes in the form of the ATS airspace classification table in Annex 11, Appendix 4, appropriately annotated to indicate those airspace classes not used by the State.

ENR 1.4.2 ATS airspace description

Other ATS airspace descriptions as applicable, including general textual descriptions.

. . .

ENR 1.5.4 Other relevant information and procedures

Brief description of additional information, e.g. entry procedures, final approach alignment, holding procedures and patterns.

. . .

ENR 1.6.4 Other relevant information and procedures

Brief description of additional information and procedures, e.g. radar failure procedures, and transponder failure procedures.

. . .

ENR 1.8 Regional supplementary procedures

The requirement is for presentation of regional supplementary procedures (SUPPs) affecting the entire area of responsibility~~, with properly annotated national differences, if any~~.

ENR 1.9 Air traffic flow management and airspace management

Brief description of air traffic flow management (ATFM) system and airspace management, including:

1) ATFM structure, service area, service provided, location of unit(s) and hours of operation;

2) types of flow messages and descriptions of the formats; and

3) procedures applicable for departing flights, containing:

   a) service responsible for provision of information on applied ATFM measures;

   b) flight plan requirements; and

   c) slot allocations.

4) Information on overall responsibility regarding airspace management within FIR(s), details of civil/military airspace allocation and management coordination, structure of manageable airspace (allocation and changes to allocation) and general operating procedures.

. . .

ENR 1.12 Interception of civil aircraft

The requirement is for a complete statement of interception procedures and visual signals to be used with a clear indication of whether ICAO provisions are applied and if not, ~~a complete presentation of differences~~ that differences exist.

Note. — A list of significant differences between national regulations and practices of the State and related ICAO provisions is found in Gen 1.7.

. . .

ENR 1.14 Air traffic incidents

Description of air traffic incidents reporting system, including:

1) definition of air traffic incidents;

2) use of the "Air Traffic Incident Reporting Form";

3) reporting procedures (including in-flight procedures); and

4) purpose of reporting and handling of the form.

Note. — A copy of the "Air Traffic Incident Report Form" (PANS ATM, Doc 4444 Appendix 4) may be included for reference.

ENR 2. AIR TRAFFIC SERVICES AIRSPACE

ENR 2.1 FIR, UIR, TMA and CTA

Detailed description of flight information regions (FIR), upper flight information regions (UIR), ~~and~~ terminal control areas (TMA) and control areas (CTA), including:

1) name, geographical coordinates in degrees and minutes of the FIR/UIR lateral limits and in degrees, minutes and seconds of the TMA and CTA lateral limits, vertical limits and class of airspace;

2) identification of unit providing the service;

3) call sign of aeronautical station serving the unit and language(s) used, specifying the area and conditions, when and where to be used, if applicable;

4) frequencies supplemented by indications for specific purposes; and

5) remarks.

. . .

ENR 3.1 Lower ATS routes

Detailed description of lower ATS routes, including:

1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;

2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;

3) upper and lower limits or minimum en-route altitudes, to the nearest higher 50 m or 100 ft, and airspace classification;

4) lateral limits and minimum obstacle clearance altitudes;

5) direction of cruising levels; ~~and~~

6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations~~.~~; and

7) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, the defined navigation specification is not considered to be an integral part of the route designator.

. . .

ENR 3.2 Upper ATS routes

Detailed description of upper ATS routes, including:

1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;

2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;

3) upper and lower limits and airspace classification;

4) lateral limits;

5) direction of cruising levels; ~~and~~

6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations~~.~~; and

7) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.3 Area navigation routes

Detailed description of area navigation (RNAV) routes, including:

1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;

2) in respect of waypoints defining an ~~VOR/DME~~ area navigation route, additionally as applicable:

   a) station identification of the reference VOR/DME;

   b) bearing to the nearest degree and the distance to the nearest tenth of a kilometre or tenth of a nautical mile from the reference VOR/DME, if the waypoint is not collocated with it; and

   c) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft);

3) geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between defined end-points and distance between each successive designated significant point;

4) upper and lower limits and airspace classification;

5) direction of cruising levels; ~~and~~

6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations~~.~~; and

7) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.4 Helicopter routes

Detailed description of helicopter routes, including:

1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;

2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;

3) upper and lower limits and airspace classification;

4) minimum flight altitudes to the nearest higher 50 m or 100 ft; ~~and~~

5) remarks, including an indication of the controlling unit and its operating frequency, and any navigation specification(s) limitations~~.~~; and

6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

. . .

ENR 4.4 Name-code designators for significant points

An alphabetically arranged list of name-code designators (five-letter pronounceable "name-code") established for significant points at positions not marked by the site of radio navigation aids, including:

1) name-code designator;

2) geographical coordinates in degrees, minutes and seconds of the position; ~~and~~

3) reference to ATS or other routes where the point is located~~.~~; and

4) remarks, including supplementary definition of positions where required.

. . .

ENR 5.3 Other activities of a dangerous nature and other potential hazards

ENR 5.3.1 Other activities of a dangerous nature

Description, supplemented by charts where appropriate, of activities that constitute a specific or obvious danger to aircraft operation and ~~that~~ could affect flights including:

. . .

Rationale

Changes to the AIP template are proposed to update the scope of information provided and to ensure that the information can be located in a consistent fashion.

PART 3 — AERODROMES (AD)

. . .

AD 1. AERODROMES/HELIPORTS — INTRODUCTION

AD 1.1 Aerodrome/heliport availability and conditions of use

Editorial Note.— AD 1.1 has been divided into subsections and a new AD 1.1.4 has been added.

AD 1.1.1 General conditions

Brief description of the State's designated authority responsible for aerodromes and heliports, including:

1) the general conditions under which aerodromes/heliports and associated facilities are available for use~~.~~, and

2) a statement concerning the ICAO documents on which the services are based and a reference to the AIP location where differences, if any, are listed~~:~~.

AD 1.1.2 Use of military air bases

~~3) r~~Regulations~~,~~ and procedures if any, concerning civil use of military air bases~~:~~.

AD 1.1.3 Low visibility procedures (LVP)

4) t The general conditions under which the low visibility procedures applicable to Cat II/III operations at aerodromes, if any, are applied;.

AD 1.1.4 Aerodrome operating minima

Details of aerodrome operating minima applied by the State.

AD 1.1.5 Runway friction measuring

5) f Friction measuring device used and the runway friction level below which the State will declare the runway to be slippery when wet.; and

AD 1.1.6 Other information

6) if applicable, other information of a similar nature.

AD 1.3 Index to aerodromes and heliports

A list, supplemented by graphic portrayal, of aerodromes and heliports within a State, including:

1) aerodrome/heliport name and ICAO location indicator;

2) type of traffic permitted to use the aerodrome/heliport (international/national, IFR/VFR, scheduled/non-scheduled, ~~private~~ general aviation, military and other); and

3) reference to AIP, Part 3 subsection in which aerodrome/heliport details are presented.

. . .

AD 2. AERODROMES

. . .

**** AD 2.2 Aerodrome geographical and administrative data

The requirement is for aerodrome geographical and administrative data including:

1) aerodrome reference point (geographical coordinates in degrees, minutes and seconds) and its site;

2) direction and distance of aerodrome reference point from centre of the city or town which the aerodrome serves;

3) aerodrome elevation to the nearest metre or foot, and reference temperature;

4) where appropriate, geoid undulation at the aerodrome elevation position to the nearest metre or foot;

5) magnetic variation to the nearest degree, date of information and annual change;

6) name of aerodrome operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;

7) types of traffic permitted to use the aerodrome (IFR/VFR); and

8) remarks.

. . .

****** AD 2.5 Passenger facilities**

~~Brief description of p~~Passenger facilities available at the aerodrome, provided as a brief description or a reference to other information sources such as a website including:

1) *hotel(s) at or in the vicinity of aerodrome;*

2) *restaurant(s) at or in the vicinity of aerodrome;*

3) *transportation possibilities;*

4) medical facilities;

5) *bank and post office at or in the vicinity of aerodrome;*

6) *tourist office;* and

7) remarks.

. . .

****** AD 2.8 Aprons, taxiways and check locations/positions data**

Details related to the physical characteristics of aprons, taxiways and locations/positions of designated checkpoints, including:

1) designation, surface and strength of aprons;

2) designation, width, surface and strength of taxiways;

3) location and elevation to the nearest metre or foot of altimeter checkpoints;

4) location of VOR checkpoints;

5) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and

6) remarks.

If check locations/positions are presented on an aerodrome chart, a note to that effect must be provided under this subsection.

****** AD 2.9 Surface movement guidance and control system and markings**

Brief description of the surface movement guidance and control system and runway and taxiway markings, including:

1) use of aircraft stand identification signs, taxiway guide lines and visual docking/parking guidance system at aircraft stands;

2) runway and taxiway markings and lights;

3) stop bars (if any); and

4) remarks.

****** AD 2.10 Aerodrome obstacles**

Detailed description of obstacles, including:

. . .

3) indication that information on obstacles in Area 3 is not provided, or if provided:

   a) obstacle identification or designation;

   b) type of obstacle;

   c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;

   d) obstacle elevation and height to the nearest tenth of metre or tenth of foot;

. . .

****** AD 2.12 Runway physical characteristics**

Detailed description of runway physical characteristics, for each runway, including:

. . .

5) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end, and where appropriate, geoid undulation of:

   — thresholds of a non-precision approach runway to the nearest metre or foot; and

   — thresholds of a precision approach runway to the nearest tenth of a metre or tenth of a foot;

. . .

****** AD 2.13 Declared distances**

Detailed description of declared distances to the nearest metre or foot for each direction of each runway , including:

1) runway designator;

2) take-off run available;

3) take-off distance available, and if applicable, alternative reduced declared distances;

4) accelerate-stop distance available;

5) landing distance available; and

6) remarks, including runway entry or start point where alternative reduced declared distances have been declared .

. . .

****** AD 2.16 Helicopter landing area**

Detailed description of helicopter landing area provided at the aerodrome, including:

1) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric centre of touch-down and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area ~~(where appropriate)~~:

. . .

****** AD 2.17 Air traffic services airspace**

Detailed description of air traffic services (ATS) airspace organized at the aerodrome, including:

1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;

2) vertical limits;

3) airspace classification;

4) call sign and language(s) of the ATS unit providing service;

5) transition altitude; ~~and~~

6) hours of applicability; and

~~6~~7) remarks.

. . .

****** AD 2.19 Radio navigation and landing aids**

Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the aerodrome, including:

1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS, and GBAS and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;

2) identification , if required;

3) frequency(ies), as appropriate;

4) hours of operation, as appropriate;

5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;

6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft); and

7) remarks.

When the same aid is used for both en-route and aerodrome purposes, a description must also be given in section ENR 4. If the ground-based augmentation system (GBAS) serves more than one aerodrome, description of the aid must be provided under each aerodrome. If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority must be indicated in the remarks column. Facility coverage must be indicated in the remarks column.

****** AD 2.20 Local ~~traffic~~ aerodrome regulations**

Detailed description of regulations applicable to the ~~traffic at~~ use of the aerodrome including ~~standard routes for taxiing aircraft, parking regulations, school and training flights and similar~~ the acceptability of training flights, non-radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

. . .

****** AD 2.22 Flight procedures**

Detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organization at the aerodrome. When established, detailed description of the low visibility procedures at the aerodrome, including:

1) runway(s) and associated equipment authorized for use under low visibility procedures;

2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made; ~~and~~

3) description of ground marking/lighting for use under low visibility procedures~~.~~ ;and

4) remarks.

. . .

AD 3. HELIPORTS

. . .

**** AD 3.2 Heliport geographical and administrative data

The requirement is for heliport geographical and administrative data, including:

1) heliport reference point (geographical coordinates in degrees, minutes and seconds) and its site;

2) direction and distance of heliport reference point from centre of the city or town which the heliport serves;

3) heliport elevation to the nearest metre or foot, and reference temperature;

4) where appropriate, geoid undulation at the heliport elevation position to the nearest metre or foot;

5) magnetic variation to the nearest degree, date of information and annual change;

6) name of heliport operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;

7) types of traffic permitted to use the heliport (IFR/VFR); and

8) remarks.

. . .

**** AD 3.5 Passenger facilities

~~Brief description of p~~Passenger facilities available at the heliport provided as a brief description or a reference to other information sources such as a website, including:

1) *hotel(s) at or in the vicinity of the heliport;*

2) *restaurant(s) at or in the vicinity of the heliport;*

3) *transportation possibilities;*

4) medical facilities;

5) *bank and post office at or in the vicinity of the heliport;*

6) *tourist office;* and

7) remarks.

. . .

**** AD 3.8 Aprons, taxiways and check locations/positions data

Details related to the physical characteristics of aprons, taxiways and locations/positions of designated checkpoints, including:

1) designation, surface and strength of aprons, helicopter stands;

2) designation, width, and surface type ~~and designation~~ of helicopter ground taxiways;

3) width and designation of helicopter air taxiway and air transit route;

4) location and elevation to the nearest metre or foot of altimeter checkpoints;

5) location of VOR checkpoints;

6) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and

7) remarks.

If check locations/positions are presented on a heliport chart, a note to that effect must be provided under this subsection.

. . .

****** AD 3.12 Heliport data**

Detailed description of heliport dimensions and related information, including:

1) heliport type — surface-level, elevated or helideck;

2) touchdown and lift-off (TLOF) area dimensions to the nearest metre or foot;

3) true bearings to one-hundredth of a degree of final approach and take-off (FATO) area;

4) dimensions to the nearest metre or foot of FATO, and surface type;

5) surface and bearing strength in tonnes (1 000 kg) of TLOF;

6) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and where appropriate, geoid undulation of the geometric centre of TLOF or of each threshold of FATO ~~(where appropriate)~~:

   — for non-precision approaches, to the nearest metre or foot; and

   — for precision approaches, to the nearest tenth of a metre or tenth of a foot;

. . .

****** AD 3.13 Declared distances**

Detailed description of declared distances to the nearest metre or foot, where relevant for a heliport, including:

1) take-off distance available, and if applicable, alternative reduced declared distances;

2) rejected take-off distance available;

3) landing distance available; and

4) remarks, including entry or start point where alternative reduced declared distances have been declared.

. . .

****** AD 3.16 Air traffic services airspace**

Detailed description of air traffic services (ATS) airspace organized at the heliport, including:

1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;

2) vertical limits;

3) airspace classification;

4) call sign and language(s) of ATS unit providing service;

5) transition altitude; ~~and~~

6) hours of applicability; and

~~6~~7) remarks.

. . .

****** AD 3.19 Local ~~traffic~~ heliport regulations**

Detailed description of regulations applicable to the ~~traffic at~~ use of the heliport, including ~~standard routes for taxiing helicopters, parking regulations, school and training flights and similar~~ the acceptability of training flights, non-radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

. . .

****** AD 3.21 Flight procedures**

Detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organization established at the heliport. When established, detailed description of the low visibility procedures at the heliport, including:

1) touchdown and lift-off (TLOF) area(s) and associated equipment authorized for use under low visibility procedures;

2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made; ~~and~~

3) description of ground marking/lighting for use under low visibility procedures~~.~~; and

4) remarks.

Rationale

Changes to the AIP template are proposed to update the scope of information provided and take into account new information required to be available and to ensure that the information can be located in a consistent fashion.

APPENDIX 2. SNOWTAM FORMAT

(see Chapter 5, 5.2.3)

(COM heading)	(PRIORITY INDICATOR)	(ADDRESSES)	≪≡
	(DATE AND TIME OF FILING)	(ORIGINATOR'S INDICATOR)	≪≡
(Abbreviated heading)	(SWAA* SERIAL NUMBER) S W * *	(LOCATION INDICATOR)	DATE-TIME OF OBSERVATION / (OPTIONAL GROUP) ≪≡(

SNOWTAM	(Serial number) <≡

(AERODROME LOCATION INDICATOR)	A) <≡
(DATE-TIME OF OBSERVATION *(Time of completion of measurement in UTC)*)	B) →
(RUNWAY DESIGNATORS)	C) →
(CLEARED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH *(m)*)	D) →
(CLEARED RUNWAY WIDTH, IF LESS THAN PUBLISHED WIDTH *(m; if offset left or right of centre line add "L" or "R")*)	E) →
(DEPOSITS OVER TOTAL RUNWAY LENGTH *(Observed on each third of the runway, starting from threshold having the lower runway designation number)* NIL — CLEAR AND DRY 1 — DAMP 2 — WET or water patches 3 — RIME OR FROST COVERED *(depth normally less than 1 mm)* 4 — DRY SNOW 5 — WET SNOW 6 — SLUSH 7 — ICE 8 — COMPACTED OR ROLLED SNOW 9 — FROZEN RUTS OR RIDGES)	F)…/…./…. →
(MEAN DEPTH *(mm)* FOR EACH THIRD OF TOTAL RUNWAY LENGTH)	G) …/…./… →
(FRICTION MEASUREMENTS ON EACH THIRD OF RUNWAY AND FRICTION MEASURING DEVICE MEASURED OR CALCULATED COEFFICIENT *or* ESTIMATED SURFACE FRICTION 0.40 and above — GOOD — 5 0.39 to 0.36 — MEDIUM/GOOD — 4 0.35 to 0.30 — MEDIUM — 3 0.29 to 0.26 — MEDIUM/POOR — 2 0.25 and below — POOR — 1 9 — unreliable — UNRELIABLE — 9 *(When quoting a measured coefficient, use the observed two figures, followed by the abbreviation of the friction measuring device used. When quoting an estimate, use single digit)*)	H) …/…./… →
(CRITICAL SNOWBANKS *(If present, insert height (cm)/distance from the edge of runway (m) followed by "L", "R" or "LR" if applicable)*)	J) →
(RUNWAY LIGHTS *(If obscured, insert "YES" followed by "L", "R" or both "LR" if applicable)*)	K) →
(FURTHER CLEARANCE *(If planned, insert length (m)/width (m) to be cleared or if to full dimensions, insert "TOTAL")*)	L) →
(FURTHER CLEARANCE EXPECTED TO BE COMPLETED BY . . . *(UTC)*)	M) →
(TAXIWAY *(If no appropriate taxiway is available, insert "NO")*)	N) →
(TAXIWAY SNOWBANKS *(If higher ~~more~~ than 60 cm, insert "YES" followed by the lateral distance apart, m)*)	P) <≡
(APRON *(If unusable insert "NO")*)	R) →
(NEXT PLANNED OBSERVATION/MEASUREMENT IS FOR) *(month/day/hour in UTC)*	S) →
(PLAIN-LANGUAGE REMARKS *(Including contaminant coverage and other operationally significant information, e.g. sanding, de-icing)*)	T))~~≪~~≡

NOTES: 1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2.
2. Information on other runways, repeat from B ~~C~~ to P.
3. Words in brackets ( ) not to be transmitted.

SIGNATURE OF ORIGINATOR *(not for transmission)*

INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

1. *General*

a) When reporting on more than one runway ~~two or three runways~~, repeat Items B ~~C~~ to P inclusive.

Rationale

For a larger airport with multiple runways, the time of observation of the runways individual conditions reported in the repeated items C to P could differ substantially. At present, airports are able to provide individual observation times for each runway through automated measurement systems and transfer the data from the originating source, for insertion automatically in the SNOWTAM format for dissemination. However, the current SNOWTAM format only allows reporting a collective time of observation for the complete movement area.

Disseminating the runways individual time of observation through a repeated Item B, creates a more accurate time-stamp on the operational significant runway conditions reported in the following Items C to P, which improves the situational awareness of reported runway conditions at the airport.

. . .

e) The abbreviated heading "TTAAiiii CCCC MMYYGGgg (BBB)" is included to facilitate the automatic processing of SNOWTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for SNOWTAM = SW;
AA = geographical designator for States, e.g. LF = FRANCE, EG = United Kingdom (see *Location Indicators* (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);
iiii = SNOWTAM serial number in a four-digit~~figure~~ group;
CCCC = four-letter location indicator of the aerodrome to which the SNOWTAM refers (see *Location Indicators* (Doc 7910));
MMYYGGgg = date/time of observation/measurement, whereby:
MM = month, e.g. January = 01,
December = 12
YY = day of the month
GGgg = time in hours (GG) and
minutes (gg) UTC;
(BBB) = optional group for:
Correction to SNOWTAM message previously disseminated with the same serial number = COR.

Note 1.— Brackets in (BBB) are used to indicate that this group is optional.

Note 2.— When reporting on more than one runway and individual dates/times of observation/measurement are indicated by repeated Item B, the latest date/time of observation/measuring is inserted in the abbreviated heading (MMYYGGgg).

Rationale

As a consequence of reporting individual date/time of observation for multiple runways in repeated Item B, the date/time of observation in the abbreviated heading should be the time of compilation of the individual runway reports into the SNOWTAM message. This procedure follows the World Meteorological Organization (*Manual on the Global Telecommunication System – No 386)* format for the time of observation in the abbreviated header in meteorological bulletins, for messages other than those with a standard time of observation.

However, to simplify the instructions for the completion of the SNOWTAM format, the *latest* date/time of observation provided for the reported runways is seen as the most practical to use in the abbreviated header, in case of reporting repeated Item B.

Example: Abbreviated heading of SNOWTAM No. 149 from Zurich, measurement/observation of 7 November at 0620 UTC:

SWLS0149 LSZH 11070620

Note. — The information groups are separated by a space, as illustrated above.

f) The text "SNOWTAM" in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group shall be separated by a space. *Example*: SNOWTAM 0124

g) For readability purposes for the SNOWTAM message, include a line feed after the SNOWTAM serial number, after Item A, after the last item referring to the runway (e.g. Item P) and after Item S.

. . .

6. *Item E* — Cleared runway width in metres, if less than published width; if offset left or right of centre line, add (without space) "L" or "R", as viewed from the threshold having the lower runway designation number.

7. *Item F* — Deposit over total runway length as explained in SNOWTAM Format. Suitable combinations of these numbers may be used to indicate varying conditions over runway segments. If more than one deposit is present on the same portion of the runway, they should be reported in sequence from the top (closest to the sky) to the bottom (closest to the runway). Drifts, depths of deposit appreciably greater than the average values or other significant characteristics of the deposits may be reported under Item T in plain language. The values for each third of the runway shall be separated by an oblique stroke (/), without space between the deposit values and the oblique stroke. For example: 47/47/47

Note.— Definitions for the various types of snow are given at the end of this Appendix.

8. *Item G* — Mean depth in millimetres deposit for each third of total runway length, or "XX" if not measurable or operationally not significant; the assessment to be made to an accuracy of 20 mm for dry snow, 10 mm for wet snow and 3 mm for slush. The values for each third of the runway shall be separated by an oblique stroke (/), without space between the values and the oblique stroke. For example: 20/20/20.

9. *Item H* — Friction measurements on each third of the runway and friction measuring device. Measured or calculated coefficient (two digits) or, if not available, estimated surface friction (single digit) in the order from the threshold having the lower runway designation number. Insert a code 9

when surface conditions or available friction measuring device do not permit a reliable surface friction measurement to be made. Use the following abbreviations to indicate the type of friction measuring device used:

BRD	Brakemeter-Dynometer
GRT	Grip tester
MUM	Mu-meter
RFT	Runway friction tester
SFH	Surface friction tester (high-pressure tire)
SFL	Surface friction tester (low-pressure tire)
SKH	Skiddometer (high-pressure tire)
SKL	Skiddometer (low-pressure tire)
TAP	Tapley meter

If other equipment is used, specify in plain language.

The values for each third of the runway are separated by an oblique stroke (/), without space between the values and the oblique stroke. For example: 5/5/5.

10. *Item J* — Critical snowbanks. If present insert height in centimetres and distance from edge of runway in metres, followed (without space) by left ("L") or right ("R") side or both sides ("LR"), as viewed from the threshold having the lower runway designation number.

11. *Item K* — If runway lights are obscured, insert "YES" followed (without space) by "L", "R" or both "LR", as viewed from the threshold having the lower runway designation number.

12. *Item L* — When further clearance will be undertaken, enter length and width of runway or "TOTAL" if runway will be cleared to full dimensions.

13. *Item M* — Enter the anticipated time of completion in UTC.

14. *Item N* — The code (and combination of codes) for Item F may be used to describe taxiway conditions; enter "NO" if no taxiways serving the associated runway are available.

15. *Item P* — If ~~applicable,~~ snow banks are higher than 60 cm, enter "YES" followed by the lateral distance parting the snow banks (the distance between) in metres.

16. *Item R* — The code (and combination of codes) for Item F may be used to describe apron conditions; enter "NO" if the apron is unusable.

17. *Item S* — Enter the anticipated time of next observation/measurement in UTC.

18. *Item T* — Describe in plain language any operationally significant information but always report on length of uncleared runway (Item D) and extent of runway contamination (Item F) for each third of the runway (if appropriate) in accordance with the following scale:

RWY CONTAMINATION 10 PERCENT ~~Runway contamination — 10 %~~ — if 10% or less ~~less than 10%~~ of runway contaminated

RWY CONTAMINATION 25 PERCENT ~~Runway contamination — 25 %~~ — if 11–25% of runway contaminated

RWY CONTAMINATION 50 PERCENT ~~Runway contamination — 50 %~~ — if 26–50% of runway contaminated

RWY CONTAMINATION 100 PERCENT ~~Runway contamination — 100 %~~ — if 51–100% of runway contaminated.

Rationale

(Item F, G, and H): The format has been clarified to specify how the thirds of the runway will be reported and formatted.

(Item P): The current SNOWTAM Format and the completion instructions split the instructions in how to report the required distance value in Item P. The split makes the instruction inconclusive, and it is difficult to understand what distance to be reported and what the reference to the distance is. To improve the understanding of the reported value in Item P, the instructions for the completion of the SNOWTAM format need to clarify the reference to the given value.

(Item T): The character % is not part of the characters permitted for aeronautical fixed service (AFS) text messages (ref ICAO Annex 10 Volume II). It is proposed to be replaced by "PERCENT". The format instruction on the scale to be followed in reporting the contamination values is currently missing the exact value 10 per cent, which is proposed to be included.

(General): For the purpose of increasing the readability of the SNOWTAM message and to facilitate automatic parsing as much as possible allowed by the current text format, clarifications to the instructions of completing the SNOWTAM format are included for a number of items, as well as specification in syntax rules for the use of characters such as space/no space and oblique stroke.

. . .

EXAMPLE OF COMPLETED SNOWTAM FORMAT

~~GG EHAMZQZX EDDFZQZX EKCHZQZX~~
~~070645 LSZHYNYX~~
~~SWLS0149 LSZH 11070620~~
~~(SNOWTAM 0149~~
~~A) LSZH B) 11070620 C) 02 D) ... P)~~
~~C) 09 D) ... P)~~
~~C) 12 D) ... P)~~
~~R) NO S) 11070920 T) DEICING)~~

GG EHAMZQZX EDDFZQZX EKCHZQZX
070645 LSZHYNYX
SWLS0149 LSZH 11070700
(SNOWTAM 0149
A)LSZH
B)11070620 C)02 D)…P)
B)11070600 C)09 D)…P)
B)11070700 C)12 D)…P)
R)NO S) 11070920
T) DEICING

Rationale

The example of the completed SNOWTAM Format is updated according to the proposed changes related to repeated Item B and the recommendations for increased readability of the message.

It is planned to include more SNOWTAM examples in ICAO Aeronautical Information Service Manual (*Doc 8126*), providing a recommended structured format of the information for different runway conditions and the correct syntax to be used.

APPENDIX 5. PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM

(see Chapter 5, 5.3.4.2 and Annex 10, Volume II, Chapter 4, 4.4.14)

1. The predetermined distribution system provides for incoming NOTAM (including SNOWTAM and ASHTAM) to be channelled through the ~~AFTN~~ AFS direct to designated addressees predetermined by the receiving country concerned while concurrently being routed to the international NOTAM office for checking and control purposes.

2. The addressee indicators for those designated addressees are constituted as follows:

1) *First and second letters:*

The first two letters of the location indicator for the ~~AFTN~~ AFS communication centre associated with the relevant international NOTAM office of the receiving country.

. . .

4) *Sixth and seventh letters:*

The sixth and seventh letters, each taken from the series A to Z and denoting the national and/or international distribution list(s) to be used by the receiving ~~AFTN~~ AFS centre.

Rationale

In this Appendix "AFTN" is corrected to "AFS" in paragraphs 1, 2. 1), and 2. 4) to be in line with paragraphs 5.3.4.2 and 9.1.

APPENDIX 6. NOTAM FORMAT

. . .

INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT

. . .

3. Qualifiers (Item Q)

. . .

2) NOTAM CODE

. . .

e) The following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:

AK	=	RESUMED NORMAL OPERATION
AL	=	OPERATIVE (OR RE-OPERATIVE) SUBJECT TO PREVIOUSLY PUBLISHED LIMITATIONS/CONDITIONS
AO	=	OPERATIONAL
CC	=	COMPLETED
CN	=	CANCELLED
HV	=	WORK COMPLETED
XX	=	PLAIN LANGUAGE

Note 1.— As Q - - AO = Operational is used for NOTAM cancellation, NOTAM promulgating new equipment or services use the following fourth and fifth letters Q - - CS = Installed.

Note 2.— Q - - CN = CANCELLED shall be used to cancel planned activities e.g. navigation warnings, as well as Q - - HV = WORK COMPLETED is used to cancel work in progress.

3) TRAFFIC

I = IFR
V = VFR
K = NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field TRAFFIC may contain combined qualifiers. Guidance concerning the combination of TRAFFIC qualifiers with subject and conditions in accordance with the compiled NOTAM qualifiers ~~Selection Criteria~~ is contained in Doc 8126.

4) PURPOSE

N = NOTAM selected for the immediate attention of ~~aircraft operators~~ flight crew members
B = NOTAM of operational significance selected for PIB entry
O = NOTAM concerning flight operations
M = Miscellaneous NOTAM; not subject for a briefing, but it is available on request
K = NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field PURPOSE may contain the combined qualifiers B~~O~~ or NB~~O~~. Guidance concerning the combination of PURPOSE qualifiers with subject and conditions in accordance with the compiled NOTAM qualifiers ~~Selection Criteria~~ is contained in Doc 8126.

Rationale

Notes 1 and 2 are introduced to give guidelines on appropriate NOTAM code and the use of the NOTAM code is clarified.

APPENDIX 7. AERONAUTICAL DATA ~~QUALITY REQUIREMENTS~~ PUBLICATION RESOLUTION AND INTEGRITY CLASSIFICATION

Editorial Note.— In tables A7-1 to A7-5 Delete the numeric values for integrity classification leaving only the classifications “routine”, “essential”, and “critical” under the column “Integrity Classification” for each feature specified.

Rationale

The title of Appendix 7 is corrected to reflect its content as data specification requirements for publication resolution and integrity classification.

In Tables A7-1 through 5 the integrity classification numeric requirements are deleted. A new definition of Integrity classification added in section 1.1. It defines the high, low or very low probability for critical, essential or routine data, that when corrupted, would have a potential risk for catastrophe. This corrects the problem of the original specification of numeric requirements for which there was no reasonable means of compliance and eliminates the need for the numeric requirements. To provide for an achievable means of compliance, the standards in 3.3.3.2 specify the requirements for validation and verification procedures for critical, essential and routine data to assure the integrity required.

. . .

Table A7-2. Elevation/altitude/height

Elevation/altitude/height	Publication resolution	Integrity Classification
Aerodrome/heliport elevation	1 m or 1 ft	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	~~1×10^{-5}~~ essential
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	~~1×10^{-5}~~ essential
Runway or FATO threshold, precision approaches	0.1 m or 0.1 ft	~~1×10^{-8}~~ critical
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.1 m or 0.1 ft	~~1×10^{-8}~~ critical
Threshold crossing height (Reference datum height), precision approaches	0.1 m or 0.1 ft	~~1×10^{-8}~~ critical
Obstacles in Area 2	1 m or 1 ft	~~1×10^{-5}~~ essential
Obstacles in Area 3	0.1 m or 0.1 ft	~~1×10^{-5}~~ essential
Obstacles in Area 1 (the entire State territory)	1 m or 1 ft	~~1×10^{-3}~~ routine
Distance measuring equipment/precision (DME/P)	3 m (10 ft)	~~1×10^{-5}~~ essential
Distance measuring equipment (DME)	30 m (100 ft)	~~1×10^{-5}~~ essential
Minimum altitudes	50 m or 100 ft	~~1×10^{-3}~~ routine

. . .

Table A7-4. Bearing

Bearing	Publication resolution	Integrity Classification
Airway segments	1 degree	~~1×10^{-3}~~ routine
~~En-route and terminal fix formations~~ Bearing used for the formation of an en route and of a terminal fix	1/10 degree	~~1×10^{-3}~~ routine
Terminal arrival/departure route segments	1 degree	~~1×10^{-3}~~ routine
~~Instrument approach procedure fix formations~~ Bearing used for the formation of an instrument approach procedure fix	1/100 degree	~~1×10^{-5}~~ essential
ILS localizer alignment (True)	1/100 degree	~~1×10^{-5}~~ essential
MLS zero azimuth alignment (True)	1/100 degree	~~1×10^{-5}~~ essential
Runway and FATO bearing (True)	1/100 degree	~~1×10^{-3}~~ routine

Table A7-5. Length/distance/dimension

Length/distance/dimension	Publication resolution	Integrity Classification
Airway segment length	1/10 km or 1/10 NM	~~1×10^{-3}~~ routine
~~En-route fix formation distance~~ Distance used for the formation of an en-route fix	1/10 km or 1/10 NM	~~1×10^{-3}~~ routine
~~Terminal and instrument approach procedure fix formation distance~~ Distance used for the formation of a terminal and instrument approach procedure fix	1/100 km or 1/100 NM	~~1×10^{-5}~~ essential
Runway and FATO length, TLOF dimensions	1 m or 1 ft	~~1×10^{-8}~~ critical
Runway width	1 m or 1 ft	~~1×10^{-5}~~ essential

Rationale

New elements have been added to support new instrument procedure requirements

The “En-route fix formation distance” and “Terminal and instrument approach procedure fix formation distance” elements are revised to delete reference to “fix formation.” The reason for the change is that the use of the term “fix formation” has been interpreted differently by AIS staff in different administrations.

APPENDIX 8. TERRAIN AND OBSTACLE DATA REQUIREMENTS

. . .

Figure A8-2. Obstacle data collection surfaces — Area 1 and Area 2

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in Table A8-2:

   a) Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists. The Area 2a obstacle collection surface shall have height of 3 m above the nearest runway elevation measured along the runway centre line, and for those portions related to a clearway, if one exists, at the elevation of the nearest runway end;

   b) 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. Obstacles less than 3 m in height above ground need not be collected;

   c) 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 shall be the elevation of the point of Area 2a at which it commences. Obstacles less than 15 m in height above ground need not be collected; and

. . .

Rationale

Note 1. b) and c) to Figure A8-2 are revised by adding "obstacle" to the reference to collection surface to agree with the references to obstacle collection surface in other parts of Note 1.

Note 1. b) is further revised to add "Obstacles less than 3 m in height above ground need not be collected" to support the depiction of this requirement in Figure A8-2.

Note 1. c) is further revised to add "Obstacles less than 15 m in height above ground need not be collected" to support the depiction of this requirement in Figure A8-2.

. . .

Figure A8-4. Terrain and obstacle data collection surface — Area 4

Terrain and obstacle data in Area 4 shall comply with the numerical requirements specified in Table A8-1 and Table A8-2 respectively.

~~*Note 1.— The horizontal extent of Area 2 covers Area 4. More detailed obstacle data may be collected in Area 4 in accordance with Area 4 numerical requirements for obstacle data specified in Table A8-2. (See 10.1.8.).*~~

Note ~~2~~.— Area 4 may be extended in accordance with 10.1.2.

Rationale

The sentence under Figure A8-4 is corrected to include reference to obstacle data and the applicable Table A8-2.

Note 1 is deleted which indicates that the Area 2 dataset meets the requirements for obstacle data in Area 4; however, research has shown that this is rarely the case and, as a result of this text, there is concern that data will not be collected when needed.

. . .

Table A8-1. Terrain data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Post spacing	3 arc seconds (approx. 90 m)	1 arc second (approx. 30 m)	0.6 arc seconds (approx. 20 m)	0.3 arc seconds (approx. 9 m)
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01 m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level	90%	90%	90%	90%
~~Data~~ Integrity classification ~~Integrity level~~	routine ~~1×10^{-3}~~	essential ~~1×10^{-5}~~	essential ~~1×10^{-5}~~	essential ~~1×10^{-5}~~
Maintenance period	as required	as required	as required	as required

Table A8-2. Obstacle data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01 m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level	90%	90%	90%	90%
~~Data~~ Integrity classification ~~Integrity level~~	routine ~~1×10^{-3}~~	essential ~~1×10^{-5}~~	essential ~~1×10^{-5}~~	essential ~~1×10^{-5}~~
Maintenance period	as required	as required	as required	as required

Rationale

In Tables A8-1 and 2 the "Data Integrity level" term is changed to "Integrity classification" to be in line with the use of the term in the specifications in Appendix 7 and the new definition of Integrity classification in section 1.1. The new definition for integrity classification defines the high, low or very low probability for critical, essential or routine data, that when corrupted, would have a potential risk for catastrophe. This corrects the problem of the original specification of numeric requirements for which there was no reasonable means of compliance. Thus, the integrity classification numeric requirements are deleted.

. . .

Table A8-3. Terrain attributes

Terrain attribute	Mandatory/Optional
Area of coverage	Mandatory
Data originator identifier	Mandatory
Data source identifier	Mandatory
Acquisition method	Mandatory
Post spacing	Mandatory
Horizontal reference system	Mandatory
Horizontal resolution	Mandatory
Horizontal accuracy	Mandatory
Horizontal confidence level	Mandatory
Horizontal position	Mandatory
Elevation	Mandatory
Elevation reference	Mandatory
Vertical reference system	Mandatory
Vertical resolution	Mandatory
Vertical accuracy	Mandatory
Vertical confidence level	Mandatory
Surface type	Optional
Recorded surface	Mandatory
Penetration level	Optional
Known variations	Optional
Integrity	Mandatory
Date and time stamp	Mandatory
Unit of measurement used	Mandatory

Table A8-4. Obstacle attributes

Obstacle attribute	Mandatory/Optional
Area of coverage	Mandatory
Data originator identifier	Mandatory
Data source identifier	Mandatory
Obstacle identifier	Mandatory
Horizontal accuracy	Mandatory
Horizontal confidence level	Mandatory
Horizontal position	Mandatory
Horizontal resolution	Mandatory
Horizontal extent	Mandatory
Horizontal reference system	Mandatory
Elevation	Mandatory
Height	Mandatory ~~Optional~~
Vertical accuracy	Mandatory
Vertical confidence level	Mandatory
~~Elevation reference~~	~~Mandatory~~
Vertical resolution	Mandatory
Vertical reference system	Mandatory
Obstacle type	Mandatory
Geometry type	Mandatory
Integrity	Mandatory
Date and time stamp	Mandatory
Unit of measurement used	Mandatory
Operations	Optional
Effectivity	Optional
Lighting	Mandatory
Marking	Mandatory

Rationale

In Tables A8-3 and 4 the attribute “Data source identifier” as a mandatory requirement is added since it is considered equally important as the existing requirement for the Data originator identifier.

In Table A8-4 attribute “Height” is revised from an optional to a mandatory requirement in consideration of the importance of the attribute. The attribute “Elevation reference” is deleted since it is not considered as required.

— — — — — — — — —

ATTACHMENT B to State letter AN 2/2.3 – 12/52

PROPOSED AMENDMENT TO ANNEX 4

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. New text to be inserted is highlighted with grey shading.	new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

TEXT OF A PROPOSED AMENDMENT TO THE

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AERONAUTICAL CHARTS

ANNEX 4

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

CHAPTER 1. DEFINITIONS, APPLICABILITY AND AVAILABILITY

1.1 Definitions

. . .

Instrument approach procedure. A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply.

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

a) routine data: 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: 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: 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.

. . .

CHAPTER 2. GENERAL SPECIFICATIONS

. . .

2.17.3 Contracting States shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. ~~Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply~~ Based on the applicable integrity classification~~s~~, the validation and verification procedures shall:

~~a) critical data, integrity level 1×10^{-8}: 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;~~

~~b) essential data, integrity level 1×10^{-5}: 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) routine data, integrity level 1×10^{-3}: 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.~~

a) For routine data: avoid corruption throughout the processing of the data;

b) For essential data assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

c) For critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note. — Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

Rationale

The specification of numeric values associated with integrity classifications has proven problematic to prove compliance. To provide for an achievable means of compliance, the paragraph is revised specify the requirements for validation and verification procedures for critical, essential and routine data to assure the integrity required.

APPENDIX 6. AERONAUTICAL DATA QUALITY REQUIREMENTS

Editorial Note.— Delete all of the numeric values for integrity classification in Appendix 6, tables 1 to 6 (i.e. all values 1×10^{-3}, 1×10^{-5}, and 1×10^{-8}) leaving only the classifications “routine”, “essential”, and “critical”. Replace the column header “Integrity / Classification” with “Integrity Classification”.

. . .

Table 2. Elevation/altitude/height

Elevation/altitude/height	Chart resolution	Integrity / Classification
Aerodrome/heliport elevation	1 m or 1 ft	~~1×10^{-5} /~~ essential
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	~~1×10^{-5} /~~ essential
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	~~1×10^{-5} /~~ essential
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	~~1×10^{-5} /~~ essential
Runway or FATO threshold, precision approaches	0.5 m or 1 ft	~~1×10^{-8} /~~ critical
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.5 m or 1 ft	~~1×10^{-8} /~~ critical
Threshold crossing height (Reference datum height), precision approaches	0.5 m or 1 ft	~~1×10^{-8} /~~ critical
Obstacle clearance altitude/height (OCA/H)	as specified in PANS-OPS (Doc 8168)	~~1×10^{-5} /~~ essential
Obstacles in Area 1 (the entire State territory)	3 m (10 ft)	~~1×10^{-3} /~~ routine
Obstacles in Area 2	1 m or 1 ft	~~1×10^{-5} /~~ essential
Obstacles in Area 3	1 m or 1 ft	~~1×10^{-5} /~~ essential
Distance measuring equipment (DME)	30 m (100 ft)	~~1×10^{-5} /~~ essential
Instrument approach procedures altitude	as specified in PANS-OPS (Doc 8168)	~~1×10^{-5} /~~ essential
Minimum altitudes	50 m or 100 ft	~~1×10^{-3} /~~ routine

. . .

Table 5. Bearing

Bearing	Chart resolution	Integrity ~~/~~ Classification
Airway segments	1 degree	~~1×10^{-3} /~~ routine
~~En-route and terminal fix formations~~ Bearing used for the formation of an en route and of a terminal fix	1/10 degree	~~1×10^{-3} /~~ routine
Terminal arrival/departure route segments	1 degree	~~1×10^{-3} /~~ routine
~~Instrument approach procedure fix formations~~Bearing used for the formation of an instrument approach procedure fix	1/10 degree	~~1×10^{-5} /~~ essential
ILS localizer alignment	1 degree	~~1×10^{-5} /~~ essential
MLS zero azimuth alignment	1 degree	~~1×10^{-5} /~~ essential
Runway and FATO bearing	1 degree	~~1×10^{-3} /~~ routine

Table 6. Length/distance/dimension

Length/distance/dimension	Chart resolution	Integrity ~~/~~ Classification
Airway segment length	1 km or 1 NM	~~1×10^{-3} /~~ routine
~~En-route fix formation distance~~ Distance used for the formation of an en-route fix	2/10 km (1/10 NM)	~~1×10^{-3} /~~ routine
Terminal arrival/departure route segment length	1 km or 1 NM	~~1×10^{-5} /~~ essential
~~Terminal and instrument approach procedure fix formation distance~~ Distance used for the formation of a terminal and instrument approach procedure fix	2/10 km (1/10 NM)	~~1×10^{-5} /~~ essential
Runway and FATO length, TLOF dimensions	1 m	~~1×10^{-8} /~~ critical
Runway width	1 m	~~1×10^{-5} /~~ essential
Stopway length and width	1 m	~~1×10^{-8} /~~ critical
Landing distance available	1 m	~~1×10^{-8} /~~ critical
Take-off run available	1 m	~~1×10^{-8} /~~ critical
Take-off distance available	1 m	~~1×10^{-8} /~~ critical
Accelerate-stop distance available	1 m	~~1×10^{-8} /~~ critical
ILS localizer antenna-runway end, distance	as plotted	~~1×10^{-3} /~~ routine
ILS glide slope antenna-threshold, distance along centre line	as plotted	~~1×10^{-3} /~~ routine
ILS marker-threshold distance	2/10 km (1/10 NM)	~~1×10^{-5} /~~ essential
ILS DME antenna-threshold, distance along centre line	as plotted	~~1v□10^{-5} /~~ essential
MLS azimuth antenna-runway end, distance	as plotted	~~1×10^{-3} /~~ routine
MLS elevation antenna-threshold, distance along centre line	as plotted	~~1×10^{-3} /~~ routine
MLS DME/P antenna-threshold, distance along centre line	as plotted	~~1×10^{-5} /~~ essential

Rationale

The deletion of the numeric values for integrity classification in Appendix 6, tables 1 through 6, of Annex 4 is consequential and follows from the recommendation for their deletion in Annex 15.

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ATTACHMENT C to State letter AN 2/2.3 – 12/52

PROPOSED AMENDMENT TO ANNEX 11

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. New text to be inserted is highlighted with grey shading.	new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

TEXT OF A PROPOSED AMENDMENT TO THE

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AIR TRAFFIC SERVICES

ANNEX 11

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

Editorial Note.— The addition of definitions of Danger, Prohibited, and Restricted Areas is consequential to the proposal to move the Section in Annex 15 specifying the identification and delineation of prohibited, restricted and danger areas to Annex 11.

CHAPTER 1. DEFINITIONS

. . .

Cyclic redundancy check (CRC). A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

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

. . .

Integrity (aeronautical data). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

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

a) routine data: 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: 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: 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.

. . .

Printed communications. Communications which automatically provide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit.

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

. . .

Rescue coordination centre. A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

Restricted area. 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.

Rationale

The definitions of *danger area*, *prohibited area*, and *restricted area* are added here to support the migration of the specifications concerning the identification of these areas from Annex 15 to Annex 11.

The addition of the definition of *Integrity classification (aeronautical data)* is added consequently to the same addition in Annex 15 and to support the consequential changes to the specifications concerning aeronautical data in section 2.19.

CHAPTER 2. GENERAL

. . .

2.19 Aeronautical data

. . .

2.19.2 Contracting States shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. ~~Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply~~ Based on the applicable integrity classifications, the validation and verification procedures shall:

~~a) critical data, integrity level 1×10^{-8}: 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;~~

~~b) essential data, integrity level 1×10^{-5}: 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) routine data, integrity level 1×10^{-3}: 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.~~

a) For routine data: avoid corruption throughout the processing of the data;

b) For essential data assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

c) For critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note. — Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

. . .

2.31 Identification and delineation of prohibited, restricted and danger areas

2.31.1 Each prohibited area, restricted area, or danger area established by a State shall, upon initial establishment, be given an identification and full details shall be promulgated.

Note.— See Annex 15, Appendix 1, ENR 5.1.

2.31.2 The identification so assigned shall be used to identify the area in all subsequent notifications pertaining to that area.

2.31.3 The identification shall be composed of a group of letters and figures as follows:

a) nationality letters for location indicators assigned to the State or territory which has established the airspace;

b) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and

c) a number, unduplicated within the State or territory concerned.

Note.— Nationality letters are those contained in Location Indicators *(Doc 7910).*

2.31.4 To avoid confusion, identification numbers shall not be reused for a period of at least one year after cancellation of the area to which they refer.

2.31.5 **Recommendation.—** *When a prohibited, restricted or danger area is established, the area should be as small as practicable and be contained within simple geometrical limits, so as to permit ease of reference by all concerned.*

Rationale

The changes to section 2.19, *Aeronautical Data*, are consequential to similar changes proposed in Annex 15 and are required to support the removal of the numeric values for data integrity.

The identification and delineation of prohibited, restricted and danger areas is consequential to the proposal to move Section 3.6.6 in Annex 15 to Annex 11. This is proposed since the SARPs therein do not pertain to AIM responsibilities but rather to airspace organization and management.

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APPENDIX 5. AERONAUTICAL DATA QUALITY REQUIREMENTS

Editorial Note.— The deletion of the numeric values for integrity classification in Appendix 5 of Annex 11 is consequential and follows from the recommendation for their deletion in Annex 15.

Table 1. Latitude and longitude

Latitude and longitude	Accuracy Data type	Integrity Classification
Flight information region boundary points	2 km declared	~~1×10^{-3}~~ routine
P, R, D area boundary points (outside CTA/CTZ boundaries)	2 km declared	~~1×10^{-3}~~ routine
P, R, D area boundary points (inside CTA/CTZ boundaries)	100 m calculated	~~1×10^{-5}~~ essential
CTA/CTZ boundary points	100 m calculated	~~1×10^{-5}~~ essential
En-route navaids and fixes, holding, STAR/SID points	100 m surveyed/calculated	~~1×10^{-5}~~ essential
Obstacles in Area 1 (the entire State territory)	50 m surveyed	~~1×10^{-3}~~ routine
Obstacles in Area 2 (the part outside the aerodrome/heliport boundary)	5 m surveyed	~~1×10^{-5}~~ essential
Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure	3 m surveyed/calculated	~~1×10^{-5}~~ essential

Note 1.— See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Note 2.— In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data are to be collected in accordance with the Area 1 numerical requirements specified in Annex 15, Appendix 8, Table A8-2.

Table 2. Elevation/altitude/height

Elevation/altitude/height	Accuracy Data type	Integrity Classification
Threshold crossing height (Reference datum height), precision approaches	0.5 m calculated	~~1×10^{-8}~~ critical
Obstacle clearance altitude/height (OCA/H)	as specified in PANS-OPS (Doc 8168)	~~1×10^{-5}~~ essential
Obstacles in Area 1 (the entire State territory), elevations	30 m surveyed	~~1×10^{-3}~~ routine
Obstacles in Area 2 (the part outside the aerodrome/heliport boundary)	3 m surveyed	~~1×10^{-5}~~ essential
Distance measuring equipment (DME), elevation	30 m (100 ft) surveyed	~~1×10^{-5}~~ essential
Instrument approach procedures altitude	as specified in PANS-OPS (Doc 8168)	~~1×10^{-5}~~ essential
Minimum altitudes	50 m calculated	~~1×10^{-3}~~ routine

Note 1.— See Annex 15, Appendix 8, for graphical illustrations of the obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Note 2.— In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data are to be collected in accordance with the Area 1 numerical requirements specified in Annex 15, Appendix 8, Table A8-2.

Table 3. Declination and magnetic variation

Declination/variation	Accuracy Data type	Integrity Classification
VHF NAVAID station declination used for technical line-up	1 degree surveyed	~~1×10^{-5}~~ essential
NDB NAVAID magnetic variation	1 degree surveyed	~~1×10^{-3}~~ routine

Table 4. Bearing

Bearing	Accuracy Data type	Integrity Classification
Airway segments	1/10 degree calculated	~~1×10^{-3}~~ routine
~~En-route and terminal fix formations~~Bearing used for the formation of an en route and of a terminal fix	1/10 degree calculated	~~1×10^{-3}~~ routine
Terminal arrival/departure route segments	1/10 degree calculated	~~1×10^{-3}~~ routine
~~Instrument approach procedure fix formations~~ Bearing used for the formation of an instrument approach procedure fix	1/100 degree calculated	~~1×10^{-5}~~ essential

Table 5. Length/distance/dimension

Length/distance/dimension	Accuracy Data type	Integrity Classification
Airway segments length	1/10 km calculated	~~1×10^{-3}~~ routine
~~En-route fix formations distance~~ Distance used for the formation of an en-route fix	1/10 km calculated	~~1×10^{-3}~~ routine
Terminal arrival/departure route segments length	1/100 km calculated	~~1×10^{-5}~~ essential
~~Terminal and instrument approach procedure fix formations distance~~ Distance used for the formation of a terminal and instrument approach procedure fix	1/100 km calculated	~~1×10^{-5}~~ essential

Rationale

The deletion of the numeric values for integrity classification in Appendix 5, tables 1 through 5, of Annex 11 is consequential and follows from the recommendation for their deletion in Annex 15.

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ATTACHMENT D to State letter AN 2/2.3-12/52

PROPOSED AMENDMENT TO ANNEX 14, VOLUME I

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. New text to be inserted is highlighted with grey shading.	new text to be inserted
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TEXT OF A PROPOSED AMENDMENT TO THE

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AERODROMES

ANNEX 14

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME I
(AERODROME DESIGN AND OPERATIONS)

CHAPTER 1. GENERAL

1.1 Definitions

Aerodrome mapping data (AMD). Data collected for the purpose of compiling aerodrome mapping information for aeronautical uses.

Note — Aerodrome mapping data are collected for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.

Aerodrome mapping database (AMDB). A collection of aerodrome mapping data organized and arranged as a structured data set.

. . .

Integrity (aeronautical data). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

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

a) routine data: 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: 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: 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.

. . .

CHAPTER 2. AERODROME DATA

2.1 Aeronautical data

2.1.1 Determination and reporting of aerodrome-related aeronautical data shall be in accordance with the accuracy and integrity requirements set forth in Tables A5-1 to A5-5 contained in Appendix 5 while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based upon a 95 per cent confidence level and in that respect, three types of positional data shall be identified: surveyed points (e.g. runway threshold), calculated points (mathematical calculations from the known surveyed points of points in space, fixes) and declared points (e.g. flight information region boundary points).

2.1.2 **Recommendation.**— *Aerodrome mapping data should be made available to the aeronautical information services for aerodromes deemed relevant by States where safety and/or performance-based operations suggest possible benefits .*

Note.— Aerodrome mapping databases related provisions are contained in Annex 15 Chapter 11.

2.1.3 Where made available in accordance with 2.1.2, the selection of the aerodrome mapping data features to be collected shall be made with consideration of the intended applications.

Note.— It is intended that the selection of the features to be collected match a defined operational need.

2.1.4 Where made available in accordance with 2.1.2, aerodrome mapping data shall comply with the accuracy and integrity requirements in Appendix 5.

Note.— Aerodrome mapping databases can be provided at one of two levels of quality - fine or medium. These levels and the corresponding numerical requirements are defined in RTCA Document DO-272A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-99A — User Requirements for Aerodrome Mapping Information.

2.1.~~2~~ 5 Contracting States shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. ~~Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply~~ Based on the applicable integrity classification~~s~~, the validation and verification procedures shall:

~~a) critical data, integrity level 1×10^{-8}: 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;~~

~~b) essential data, integrity level 1×10^{-5}: 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) routine data, integrity level 1×10^{-3}: 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.~~

a) For routine data: avoid corruption throughout the processing of the data;

b) For essential data assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

c) For critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note.— Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

Editorial Note.— Renumber subsequent paragraphs accordingly.

Rationale

The addition of the definition of *Integrity classification (aeronautical data)* is added as a consequence to the same addition in Annex 15 and to support the consequential changes to the specifications concerning aeronautical data in section 2.1.

The addition of new provisions with respect to Aerodrome Mapping Data in Annex 14 is consequential to their addition in Annex 15. Aerodrome Mapping Data supports applications that improve situational awareness or supplement surface navigation and thereby provide safety and operational benefits. The changes to Annex 14 are intended for States to determine when there is value to collect the data in terms of a specific application (e.g. low visibility operations) and to ensure that the appropriate accuracy and integrity requirements are met.

The changes to section 2.1, *Aeronautical Data*, are consequential to similar changes proposed in Annex 15 and are required to support the removal of the numeric values for data integrity.

APPENDIX 5. AERONAUTICAL DATA QUALITY REQUIREMENTS

*Editorial Note.—*The deletion of the numeric values for integrity classification in Appendix 5 of Annex 14 is consequential and follows from the recommendation for their deletion in Annex 15.

Table A5-1. Latitude and longitude

Latitude and longitude	Accuracy Data type	Integrity Classification
Aerodrome reference point	30 m surveyed/calculated	~~1×10^{-3}~~ routine
Navaids located at the aerodrome	3 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 3	0.5 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 2 (the part within the aerodrome boundary)	5 m surveyed	~~1×10^{-5}~~ essential
Runway thresholds	1 m surveyed	~~1×10^{-8}~~ critical
Runway end (flight path alignment point)	1 m surveyed	~~1×10^{-8}~~ critical
Runway centre line points	1 m surveyed	~~1×10^{-8}~~ critical
Runway-holding position	0.5 m surveyed	~~1×10^{-8}~~ critical
Taxiway centre line/parking guidance line points	0.5 m surveyed	~~1×10^{-5}~~ essential
Taxiway intersection marking line	0.5 m surveyed	~~1×10^{-5}~~ essential
Exit guidance line	0.5 m surveyed	~~1×10^{-5}~~ essential
Apron boundaries (polygon)	1 m surveyed	~~1×10^{-3}~~ routine
De-icing/anti-icing facility (polygon)	1 m surveyed	~~1×10^{-3}~~ routine
Aircraft stand points/INS checkpoints	0.5 m surveyed	~~1×10^{-3}~~ routine

Note.— See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table A5-2. Elevation/altitude/height

Elevation/altitude/height	Accuracy Data type	Integrity Classification
Aerodrome elevation	0.5 m surveyed	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at aerodrome elevation position	0.5 m surveyed	~~1×10^{-5}~~ essential
Runway threshold, non-precision approaches	0.5 m surveyed	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at runway threshold, non-precision approaches	0.5 m surveyed	~~1×10^{-5}~~ essential
Runway threshold, precision approaches	0.25 m surveyed	~~1×10^{-8}~~ critical
WGS-84 geoid undulation at runway threshold, precision approaches	0.25 m surveyed	~~1×10^{-8}~~ critical
Runway centre line points	0.25 m surveyed	~~1×10^{-8}~~ critical
Taxiway centre line/parking guidance line points	1 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 2 (the part within the aerodrome boundary)	3 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 3	0.5 m surveyed	~~1×10^{-5}~~ essential
Distance measuring equipment/precision (DME/P)	3 m surveyed	~~1×10^{-5}~~ essential

Note.— See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Editorial Note.— Delete all of the numeric values for integrity classification in Appendix 5, tables A5-3 to A5-5 (i.e. all values 1 × 10-3, 1 × 10-5, and 1 × 10-8) leaving only the classifications "routine", "essential", and "critical" as shown in the preceding changes to tables A5-1 and A5-2.

Rationale

The deletion of the numeric values for integrity classification in Appendix 5, tables A5-1 through A5-5, of Annex 14, Volume 1 is consequential and follows from the recommendation for their deletion in Annex 15.

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ATTACHMENT E to State letter AN 2/2.3-12/52

PROPOSED AMENDMENT TO ANNEX 14, VOLUME II

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~	text to be deleted
2. New text to be inserted is highlighted with grey shading.	new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

TEXT OF A PROPOSED AMENDMENT TO THE

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

AERODROMES

ANNEX 14

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

VOLUME II (HELIPORTS)

CHAPTER 1. GENERAL

1.1 Definitions

. . .

Integrity (aeronautical data). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

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

a) routine data: 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: 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: 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.

. . .

CHAPTER 2. HELIPORT DATA

2.1 Aeronautical data

2.1.1 Determination and reporting of aerodrome-related aeronautical data shall be in accordance with the accuracy and integrity requirements set forth in Tables A5-1 to A5-5 contained in Appendix 5 while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based upon a 95 per cent confidence level and in that respect, three types of positional data shall be identified: surveyed points (e.g. runway threshold), calculated points (mathematical calculations from the known surveyed points of points in space, fixes) and declared points (e.g. flight information region boundary points).

. . .

2.1.2 Contracting States shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. ~~Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply~~ Based on the applicable integrity classification~~s~~, the validation and verification procedures shall:

~~a) critical data, integrity level 1×10^{-8}: 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;~~

~~b) essential data, integrity level 1×10^{-5}: 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) routine data, integrity level 1×10^{-3}: 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.~~

a) For routine data: avoid corruption throughout the processing of the data;

b) For essential data assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

c) For critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note. — Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data..

Rationale

The addition of the definition of *Integrity classification (aeronautical data)* is added as a consequence to the same addition in Annex 15 and to support the consequential changes to the specifications concerning aeronautical data in section 2.1.

The changes to section 2.1, *Aeronautical Data*, are consequential to similar changes proposed in Annex 15 and are required to support the removal of the numeric values for data integrity.

APPENDIX 1. AERONAUTICAL DATA QUALITY REQUIREMENTS

Editorial Note.— The deletion of the numeric values for integrity classification in Appendix 1 of Annex 14, Volume II is consequential and follows from the recommendation for their deletion in Annex 15.

Table A1-1. Latitude and longitude

Latitude and longitude	Accuracy Data type	Integrity Classification
Heliport reference point	30 m surveyed/calculated	~~1×10^{-3}~~ routine
Navaids located at the heliport	3 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 3	0.5 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 2 (the part within the heliport boundary)	5 m surveyed	~~1×10^{-5}~~ essential
Geometric centre of TLOF or FATO thresholds	1 m surveyed	~~1×10^{-8}~~ critical
Ground taxiway centre line points, air taxiway and transit points	0.5 m surveyed	~~1×10^{-5}~~ essential
Ground taxiway intersection marking line	0.5 m surveyed	~~1×10^{-5}~~ essential
Ground exit guidance line	0.5 m surveyed	~~1×10^{-5}~~ essential
Apron boundaries (polygon)	1 m surveyed	~~1×10^{-3}~~ routine
De-icing/anti-icing facility (polygon)	1 m surveyed	~~1×10^{-3}~~ routine
Helicopter stand points/INS checkpoints	0.5 m surveyed	~~1×10^{-3}~~ routine

Note.— See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Table A1-2. Elevation/altitude/height

Elevation/altitude/height	Accuracy Data type	Integrity Classification
Heliport elevation	0.5 m surveyed	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at heliport elevation position	0.5 m surveyed	~~1×10^{-5}~~ essential
FATO threshold, non-precision approaches	0.5 m surveyed	~~1×10^{-5}~~ essential
WGS-84 geoid undulation at FATO threshold, TLOF geometric centre, non-precision approaches	0.5 m surveyed	~~1×10^{-5}~~ essential
FATO threshold, precision approaches	0.25 m surveyed	~~1×10^{-8}~~ critical
WGS-84 geoid undulation at FATO threshold, TLOF geometric centre , precision approaches	0.25 m surveyed	~~1×10^{-8}~~ critical
Ground Taxiway centre line points, air taxiway and transit points	1 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 2 (the part within the heliport boundary)	3 m surveyed	~~1×10^{-5}~~ essential
Obstacles in Area 3	0.5 m surveyed	~~1×10^{-5}~~ essential
Distance measuring equipment/precision (DME/P)	3 m surveyed	~~1×10^{-5}~~ essential

Note.— See Annex 15, Appendix 8, for graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Editorial Note.— Delete all of the numeric values for integrity classification in Appendix 1, tables A1-3 to A1-5 (i.e. all values 1 × 10-3, 1 × 10-5, and 1 × 10-8) leaving only the classifications "routine", "essential", and "critical" as shown in the preceding changes to tables A1-1 and A1-2.

Rationale

The deletion of the numeric values for integrity classification in Appendix 1, tables A1-1 through A1-5, of Annex 14, Volume II is consequential and follows from the recommendation for their deletion in Annex 15.

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ATTACHMENT F to State letter AN 2/2.3 – 12/52

RESPONSE FORM TO BE COMPLETED AND RETURNED TO ICAO TOGETHER WITH ANY COMMENTS YOU MAY HAVE ON THE PROPOSED AMENDMENTS

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montréal, Quebec
Canada, H3C 5H7

(State) _____

Please make a checkmark (✓) against one option for each amendment. If you choose options "agreement with comments" or "disagreement with comments", **please provide your comments on separate sheets**.

	Agreement without comments	*Agreement with comments**	*Disagreement without comments*	*Disagreement with comments*	*No position*
Amendment to Annex 15 — *Aeronautical Information Services* (Attachment A refers)					
Amendment to Annex 4 — *Aeronautical Charts* (Attachment B refers)					
Amendment to Annex 11 — *Air Traffic Services* (Attachment C refers)					
Amendment to Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* (Attachment D refers)					
Amendment to Annex 14 — *Aerodromes*, Volume II — *Heliports* (Attachment E refers)					

*"Agreement with comments" indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature: _____ Date: _____

— END —