



ICAO

International Standards
and Recommended Practices

Annex 15 to the Convention on International Civil Aviation

Aeronautical Information Services

Sixteenth Edition, July 2018



This edition supersedes, on 8 November 2018, all previous editions of Annex 15.

For information regarding the applicability of the Standards and Recommended Practices, see Foreword.

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AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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FOREWORD

Historical background

Standards and Recommended Practices for aeronautical information services were first adopted by the Council on 15 May 1953, pursuant to the provisions of Article 37 of the Convention on International Civil Aviation (Chicago 1944), and were designated as Annex 15 to the Convention.

Annex 15 as now presented has undergone the following development. The first requirements were developed by the Air Navigation Committee as a result of recommendations of Regional Air Navigation Meetings, and were published by authority of the Council as *Procedures for International Notices to Airmen* (PANS-NOTAM, PICAQ Doc 2713) in January 1947. In 1949, the Special NOTAM Meeting reviewed and proposed amendments to these procedures which were later issued as *Procedures for Air Navigation Services* (PANS-AIS, Doc 7106) and which became applicable on 1 August 1951. In 1952, the PANS-AIS was reviewed by the First Session of the Aeronautical Information Services Division which recommended the adoption of Standards and Recommended Practices. Following consideration by all Contracting States, these recommendations were reviewed by the Air Navigation Commission and the first set of Standards and Recommended Practices was adopted by the Council on 15 May 1953 as Annex 15 to the Convention. This Annex became applicable on 1 April 1954.

Table A shows the origin of subsequent amendments together with a list of the principal subjects involved and the dates on which the Annex and the amendments were adopted by the Council, when they became effective and when they became applicable.

Applicability

The Standards and Recommended Practices in this document govern the application of the *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM, Doc 10066) and the *Regional Supplementary Procedures — Aeronautical Information Services*, contained in Doc 7030, in which latter document will be found subsidiary procedures of regional application.

Action by Contracting States

Notification of differences. The attention of Contracting States is drawn to the obligation imposed by Article 38 of the Convention by which Contracting States are required to notify the Organization of any differences between their national regulations and practices and the International Standards contained in this Annex and any amendments thereto. Contracting States are invited to extend such notification to any differences from the Recommended Practices contained in this Annex and any amendments thereto, when the notification of such differences is important for the safety of air navigation. Further, Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur, or of the withdrawal of any differences previously notified. A specific request for notification of differences will be sent to Contracting States immediately after the adoption of each amendment to this Annex.

Status of Annex components

An Annex is made up of the following component parts, not all of which, however, are necessarily found in every Annex; they have the status indicated:

1.— *Material comprising the Annex proper:*

- a) *Standards and Recommended Practices* adopted by the Council under the provisions of the Convention. They are defined as follows:

Standard: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38.

Recommended Practice: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention.

- b) *Appendices* comprising material grouped separately for convenience but forming part of the Standards and Recommended Practices adopted by the Council.
- c) *Definitions* of terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.
- d) *Tables and Figures* which add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

It is to be noted that some Standards in this Annex incorporate, by reference, other specifications having the status of Recommended Practices. In such cases the text of the Recommended Practice becomes part of the Standard.

2.— *Material approved by the Council for publication in association with the Standards and Recommended Practices:*

- a) *Forewords* comprising historical and explanatory material based on the action of the Council and including an explanation of the obligations of States with regard to the application of the Standards and Recommended Practices ensuing from the Convention and the Resolution of Adoption.
- b) *Introductions* comprising explanatory material introduced at the beginning of parts, chapters or sections of the Annex to assist in the understanding of the application of the text.
- c) *Notes* included in the text, where appropriate, to give factual information or references bearing on the Standards or Recommended Practices in question, but not constituting part of the Standards or Recommended Practices.
- d) *Attachments* comprising material supplementary to the Standards and Recommended Practices, or included as a guide to their application.

Selection of language

This Annex has been adopted in six languages — English, Arabic, Chinese, French, Russian and Spanish. Each Contracting State is requested to select one of those texts for the purpose of national implementation and for other effects provided for in the Convention, either through direct use or through translation into its own national language, and to notify the Organization accordingly.

Editorial practices

The following practice has been adhered to in order to indicate at a glance the status of each statement: *Standards* have been printed in light face roman; *Recommended Practices* have been printed in light face italics, the status being indicated by the prefix **Recommendation**; *Notes* have been printed in light face italics, the status being indicated by the prefix *Note*.

The following editorial practice has been followed in the writing of specifications: for Standards the operative verb “shall” is used, and for Recommended Practices the operative verb “should” is used.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in Annex 5 to the Convention on International Civil Aviation. Where Annex 5 permits the use of non-SI alternative units these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

In order to maintain a comprehensive edition of this Annex, the latest amendments have been consolidated in a new edition of the Annex. In so doing, provisions with particular applicability dates have been adjusted editorially, as appropriate.

Table A. Amendments to Annex 15

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
1st Edition	First Session of the Aeronautical Information Services Division		15 May 1953 1 September 1953 1 April 1954
1	Consultation with States	Editorial amendments for consistency in terminology.	27 May 1955 1 October 1955 1 October 1955
2	Consultation with States	Editorial amendments for consistency in terminology.	15 May 1956 15 September 1956 1 December 1956
3	Consultation with States	Definition and identification of prohibited, restricted and danger areas.	16 April 1957 1 September 1957 1 December 1957

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
4	Consultation with States	Guidance material on the application of the definitions of danger area, prohibited area and restricted area.	14 November 1958 — 14 November 1958
5	Consultation with States	Editorial amendments for consistency in terminology; establishment of worldwide application of location indicators instead of place name abbreviations.	24 March 1959 1 September 1959 1 October 1959
6	Aeronautical Information Services and Aeronautical Charts Division	Contents of Aeronautical Information Publications (AIP); specifications for Aeronautical Information Circulars, and the NOTAM Code.	20 June 1960 1 October 1960 1 January 1961
7	Aeronautical Information Services and Aeronautical Charts Division	Deletion of guidance material.	2 December 1960 — 1 January 1961
8	Correspondence and Council Action to approve new <i>ABC — ICAO Abbreviations and Codes</i> (Doc 8400)	Regulated system (AIRAC); deletion of “NOTAM Code” and “Abbreviations for use by aeronautical information services”; minor amendments to Appendix 1.	25 March 1964 1 August 1964 1 November 1964
9	Rules of the Air and Air Traffic Services/Operations Divisional Meeting	Definitions for danger area, prohibited area, and restricted area.	10 December 1965 10 April 1966 25 August 1966
10	Aeronautical Information Services and Aeronautical Charts Division (1966)	Specifications for Snowplan; definition and <i>pro forma</i> for SNOWTAM; NOTAM Class I text; content of AIP; identification and delineation of restricted airspace; Aeronautical Information Circulars.	13 June 1967 8 October 1967 8 February 1968
11	Fifth Air Navigation Conference	Pre-flight information service; information on runway visual range systems.	23 January 1969 23 May 1969 18 September 1969
12	Sixth Air Navigation Conference, and transfer from Regional Supplementary Procedures	Publication of information on air traffic services systems, i.e. on reporting points and minimum flight altitudes; NOTAM information on the conduct of search and rescue operations.	15 May 1970 15 September 1970 4 February 1971
13	Aeronautical Information Services and Aeronautical Charts Division; Sixth Air Navigation Conference	Predetermined distribution system of NOTAM Class I; composition of NOTAM; information on aeronautical meteorological facilities and services available for international air navigation.	19 March 1971 6 September 1971 6 January 1972
14	Regional Air Navigation Meeting Recommendations of worldwide applicability. Recommendation 19/29 of CAR IV RAN Meeting (1966); Recommendation 19/10 of SAM/SAT/III RAN Meeting (1967); Recommendations 19/4 and 19/5 of MID/SEA RAN Meeting (1968); Recommendation 17/5 of NAT/V RAN Meeting (1970)	Availability of Aeronautical Information Service in cases where 24-hour service is not provided; decoding of NOTAM for pre-flight planning; promulgation of information that no NOTAM Class II have been issued; provision of information to the aeronautical information service by each of the State services associated with aircraft operations; publication in AIP of the coordinates of the antennae of stations providing aeronautical mobile and/or aeronautical navigation services, to an accuracy of at least one-tenth of a minute.	15 December 1971 15 April 1972 7 December 1972

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
15	Amendment 43 to Annex 4 — <i>Aeronautical Charts</i> ; Amendment 1 to 10th edition of PANS-RAC (Doc 4444); Recommendations 16/3, 16/8, 16/10 b) and 16/15 of the 6th EUM RAN Meeting; Amendment 28 to Annex 14 — <i>Aerodromes</i> ; Amendment 51 to Annex 10 — <i>Aeronautical Telecommunications</i>	Publication in AIP of the locations at aerodromes of VOR and INS check-points; publication in AIP of names, coded designators and geographical coordinates of significant points defining air traffic services routes, and of information on bird concentrations in the vicinity of aerodromes and bird migrations; listing of types of information inappropriate to NOTAM; type of information appropriate to Aeronautical Information Circulars; alignment of the terminology with the definition in Annex 14 for snow on the ground.	19 March 1973 30 July 1973 23 May 1974
16	Council's request (78-14) to consult States on publication in AIP of differences from Annexes and PANS; Amendment 6 to the PANS-RAC	Publication in AIP of differences between the national regulations and practices of a State and the related ICAO Standards, Recommended Practices and Procedures; elimination of inconsistencies between requirements in Appendix 1 and parent provisions in the Annex; transfer of requirements for information concerning ATIS from the MET to the RAC part of the AIP.	25 June 1974 25 October 1974 27 February 1975
17	Recommendation 2/6 of the Fourth Meeting of the Technical Panel on Supersonic Transport Operations; study by the Air Navigation Commission concerning interception of aircraft	Dissemination by NOTAM of forecasts of solar cosmic radiation where provided; publication in AIP of interception procedures and visual signals to be used.	4 February 1975 4 June 1975 9 October 1975
18	Recommendations of Regional Air Navigation Meetings (EUM 6 Rec 9/4, AFI/5 Rec 6/2 c), d) and ASIA/PAC Rec 6/3 c)) and request by IATA to amend Annex 14; general review of Annex 14	Publication in AIP of information concerning operations for the removal of disabled aircraft at aerodromes; notification of the status of rescue and fire fighting services available at an aerodrome in terms of significant changes in the level of protection; definitions for manoeuvring area and movement area; substitution of expression "altimeter check location" for "altimeter checkpoint".	5 February 1976 5 June 1976 30 December 1976
19	Recommendation 3/16 of the 7th Air Navigation Conference; revision (Amendment No. 60) of Annex 3 — <i>Meteorological Service for International Air Navigation</i>	Publication in AIP, in the case of ILS installations, the extent of compliance with the provisions in Annex 10 regarding localizer and glide path beam structure and of the height of the ILS reference datum; realignment of Part 4 — Meteorology with the new specifications and terminology introduced by Amendment 60 to Annex 3.	27 June 1977 27 October 1977 23 February 1978
20	9th Air Navigation Conference	Publication in the AIP of description of ATS routes; North reference (magnetic, true or grid) for tracks or bearings.	9 December 1977 9 April 1978 10 August 1978
21	Proposals submitted by the Federal Republic of Germany (also on behalf of the United Kingdom) and the Union of Soviet Socialist Republics	NOTAM Class I format and the publication of amendments to the AIP.	31 March 1980 31 July 1980 27 November 1980
22	Proposal arising from a study by the Air Navigation Commission and proposal submitted by the Secretariat	Activities which constitute a potential hazard to flights of civil aircraft and receipt of AIRAC NOTAM 28 days in advance of the effective date.	13 March 1981 13 July 1981 26 November 1981
23	Proposals submitted by the Secretariat and the United Kingdom	Plain-language pre-flight information bulletins, interception of civil aircraft and "Nil Notification" of AIRAC NOTAM.	2 April 1982 2 August 1982 25 November 1982

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
24	Recommendations 7/5, 7/8 and 10/2 of the Aerodromes, Air Routes and Ground Aids Divisional Meeting (1981)	Revised SNOWTAM format; publication in the AIP of wet runway surface friction and of the existence of an obstacle-free zone.	17 November 1982 17 March 1983 24 November 1983
25	Recommendation 7/7 of the Aerodromes, Air Routes and Ground Aids Divisional Meeting (1981)	Method of referencing date/time.	25 March 1985 29 July 1985 21 November 1985
26	Various sources, including Conclusions 22/24 and 24/20 of the European Air Navigation Planning Group (EANPG); Recommendation 9 of All Weather Operations Panel (AWOP); Recommendation 1/4 of the Obstacle Clearance Panel (OCP); Amendments 64, 47 and 38 to Annexes 3, 4 and 14 respectively; proposals submitted by the United Kingdom and by the Secretariat	Updating of the provisions relating to the use of A-4 sheet size paper in the AIP; origination and distribution of NOTAM and AIC; adequacy and authenticity of aeronautical information and the regulated system (AIRAC); changes to predetermined distribution system for NOTAM Class I; introduction of an abbreviated heading and changes to the SNOWTAM format and the guidance for its completion; publication in the AIP of the location of the DME zero-range indication point; updating of the list of charts forming part of the AIP; publication in the AIP of additional operational data concerning standard routes for taxiing aircraft, highest elevation of the touchdown zone of a precision approach runway, and geographical coordinates of thresholds and aircraft stands; inclusion of references to the seventh and eighth letters in the address indicators in the predetermined distribution system; and volcanic ash cloud warnings.	6 March 1987 27 July 1987 22 October 1987
27	Various sources, including Conclusion 30/15 of the European Air Navigation Planning Group (EANPG); Air Navigation Commission's review of the Annexes; Recommendation 3/3 of the Visual Flight Rules Operations Panel (VFOP); proposal submitted by some European States; and Amendment 39 to Annex 14	Introduction of Integrated Aeronautical Information Package and revised NOTAM Format; promulgation of information on areas or routes where the possibility of interception exists and information relating to safeguarding international civil aviation against acts of unlawful interference; introduction of new ATS airspace classification; bird hazard reduction; updating of terminology and list of friction devices associated with measuring of paved surfaces; introduction of heliport data.	4 March 1991 28 July 1991 14 November 1991

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
28	Various sources, including Conclusion 34/12 of the European Air Navigation Planning Group (EANPG); adoption by the Council of WGS-84 as the standard geodetic reference system for international aviation; proposal by RGCS/8; and the Secretariat	Introduction in Chapter 2 of new and revised definitions relating to heliport and Integrated Aeronautical Information Package; amendments to Chapter 3 related to the exchange of aeronautical information and introduction of new provisions concerning the promulgation of WGS-84 related geographical coordinates; amendments and rearrangements of Chapter 4 concerning the restructured contents and general specifications of AIP, AIP Amendment and AIP Supplement specifications and their distribution; amendments to Chapter 5 concerning NOTAM origination and distribution and introduction of a new provision governing the promulgation of information on the release into the atmosphere of radioactive materials and toxic chemicals; upgrading in Chapter 6 to a Standard, of a provision concerning the use of AIRAC dates for the promulgation of changes requiring cartographic work and for updating of navigation databases; deletion in Chapter 8 of a Recommended Practice relating to the format of pre-flight information bulletins; substitution, in Chapter 9, of the specific term “aeronautical fixed telecommunication network (AFTN)” by the general term “aeronautical fixed service (AFS)”;	28 February 1994 28 June 1994 10 November 1994; 25 April 1996; 1 January 1998
29 (Tenth Edition)	Air Navigation Commission and Volcanic Ash Warnings Study Group (VAWSG)	Aeronautical databases, humanitarian flights, a special series NOTAM for volcanic activity and vertical component of the World Geodetic System — 1984 (WGS-84).	20 March 1997 21 July 1997 6 November 1997; 1 January 1998; 5 November 1998
30	Recommendations 1.2/1, 3.3/2 and 4.1/2 of the Aeronautical Information Services/ Aeronautical Charts (AIS/MAP) Divisional Meeting (1998); Air Navigation Commission	Introduction into Chapter 2 of new definitions for aeronautical data, aeronautical information, aeronautical information service, air defence identification zone (ADIZ), AIS product, Human Factors principles, and quality management; new provisions in Chapter 3 concerning the quality system, exchange of aeronautical information/data, copyright, cost recovery, and Human Factors considerations; restructured and new provisions in Chapter 6 dealing with the provision of AIRAC information in electronic form; and introduction into Appendix 1 of new provisions concerning ADIZ.	21 February 2000 17 July 2000 2 November 2000
31	Secretariat	New provisions in Chapter 8 concerning automated aeronautical information systems and harmonized AIS/MET pre-flight briefing and revision of Appendix 1 concerning the provision of information on activities of a dangerous nature and other potential hazards.	7 March 2001 16 July 2001 1 November 2001

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
32 (Eleventh Edition)	Various sources, including Conclusion 40/51 b) of the European Air Navigation Planning Group (EANPG); Conclusion 13/51 of the AFI Planning and Implementation Regional Group (APIRG); Air Navigation Commission; and the Secretariat	Introduction in Chapter 2 of a revised definition for Integrated Aeronautical Information Package; upgrading to a Standard of a provision in Chapter 3 concerning the use of English text; amendments to Chapter 4 concerning specifications for AIP Amendments and Supplements; restructuring and amending of provisions in Chapter 5 and Appendix 6; promulgation by NOTAM of contingency measures; new provisions in Chapter 8 concerning collection of information on the presence of bird hazards to aircraft operations at aerodromes/heliports; and alignment of Appendix 1 with the provisions of Annex 3.	28 February 2003 14 July 2003 27 November 2003
33 (Twelfth Edition)	Recommendation 4/6 of OCP/12; Recommendation 5.3/2 of OCP/13; Recommendation 3/1 of GNSSP/4; Air Navigation Commission; and the Secretariat	New provisions concerning definitions; the vertical reference system and the temporal reference system for international civil aviation; electronic terrain and obstacle data; aeronautical data quality requirements; inclusion of GNSS-related elements in aeronautical information; and the Radar Minimum Altitude Chart — ICAO; and updating of existing provisions related to the World Geodetic System — 1984 (WGS-84) and the Aeronautical Information Publication (AIP).	23 February 2004 12 July 2004 25 November 2004; 20 November 2008; 18 November 2010
34	Various sources, including EANPG Conclusion 44/19, Recommendation 2.3/2 of the AIS/MAP Divisional Meeting (1998), and recommendations of the IAWVOPSG/1, OCP/14 and OPLINKP/1 meetings	Definitions and introduction of a new Aerodrome Terrain and Obstacle Chart — ICAO (Electronic). Updating of existing provisions related to the distribution of NOTAM on volcanic activity; use of the AIRAC system; information included in pre-flight briefings; and information to be included in the AIP.	2 March 2007 16 July 2007 22 November 2007
35	Proposals by the Navigation Systems Panel third working group of the whole (NSP/WG/WHL/3); the Secretariat with the assistance of the Required Navigation Performance and Special Operational Requirements Study Group (RNPSORSG); proposals by the Aerodromes Panel (AP/1); and Recommendation 9/3 of the Instrument Flight Procedures Panel first working group of the whole (IFPP/WG/WHL/1)	Definitions and new provisions relating to the provision of information on the status of navigation aids; performance-based navigation terminology; promulgation in the AIP of the status of aerodrome certification; and instrument flight procedures terminology.	4 March 2009 20 July 2009 19 November 2009
36 (Thirteenth Edition)	The Secretariat with the assistance of the Aviation Use of the Public Internet Study Group (AUPISG) and the Aeronautical Information Services–Aeronautical Information Management Study Group (AIS-AIMSG); recommendations of the fourth meeting of the International Airways Volcano Watch Operations Group (IAVWOPSG/4)	New provisions relating to the operational use of the public Internet; the reporting of volcanic ash deposition; quality management systems; the use of automation enabling digital data exchange; electronic aeronautical information publications; the NOTAM Format; and electronic terrain and obstacle data.	22 February 2010 12 July 2010 18 November 2010; 12 November 2015
37 (Fourteenth Edition)	Secretariat with assistance from the Aeronautical Information Services–Aeronautical Information Management Study Group (AIS-AIMSG) and the Aerodromes Panel (AP).	Chapters 1 to 3 restructured; definitions relating to aerodrome mapping data, aeronautical information management, integrity classification; use of the terms “information” and “data”; State and AIS provider responsibilities and functions; information management requirements; data quality; use of automation; aerodrome mapping data; AIP specifications; SNOWTAM; terrain and obstacle data; integrity classifications.	1 March 2013 15 July 2013 14 November 2013

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
38	Instrument Flight Procedures Panel (IFPP)	Procedure design criteria and charting requirements to support performance-based navigation (PBN) as well as helicopter point-in-space (PinS) approach and departure operations.	3 March 2014 14 July 2014 13 November 2014
39-A (Fifteenth Edition)	Third meeting of the Aerodrome Panel (AP/3); twelfth meeting of the Instrument Flight Procedures Panel (IFPP/12); second meeting of the Operational Data Link Panel (OPLINKP/2)	Amendment concerning publication of information on runway end safety area (RESA) and arresting system in the AIP; en-route airway directional use restrictions; and performance-based communication and surveillance (PBCS) and satellite voice communications (SATVOICE).	22 February 2016 11 July 2016 10 November 2016
39-B	Friction Task Force (FTF) of the Aerodrome Design and Operations Panel (ADOP)	Amendment concerning the use of a global reporting format for assessing and reporting runway surface conditions.	22 February 2016 11 July 2016 5 November 2020
40 (Sixteenth Edition)	Twelfth meeting of the AIS-AIM Study Group (AIS-AIMSG/12); second meeting of the Meteorology Panel (METP/2)	Amendment concerning restructure of Annex 15 to facilitate incorporation of aeronautical information management (AIM) requirements; changes to the technical content of Annex 15 to facilitate the transition from AIS to AIM; and consequential amendment in support of space weather information.	9 March 2018 16 July 2018 8 November 2018

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

CHAPTER 1. GENERAL

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

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).

Note 3.— These Standards and Recommended Practices are to be used in conjunction with the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).

Note 4.— Guidance material on the organization and operation of the AIS is contained in the Aeronautical Information Services Manual (Doc 8126).

1.1 Definitions

When the following terms are used in the Standards and Recommended Practices for the AIS, 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 is 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 chart. A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

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

Aeronautical fixed service (AFS). A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

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

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 product. Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include:

- Aeronautical Information Publication (AIP), including Amendments and Supplements;
- Aeronautical Information Circulars (AIC);
- aeronautical charts;
- NOTAM; and
- digital data sets.

Note.—Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.

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 necessary for the safety, regularity and efficiency of air navigation.

AIP Amendment. Permanent changes to the information contained in the AIP.

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

AIRAC. An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification, based on common effective dates, of circumstances that necessitate significant changes in operating practices.

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.

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.

Application. Manipulation and processing of data in support of user requirements (ISO 19104*).

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

Note.— Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

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

Assemble. A process of merging data from multiple sources into a database and establishing a baseline for subsequent processing.

Note.— The assemble phase includes checking the data and ensuring that detected errors and omissions are rectified.

ATS surveillance service. Term used to indicate a service provided directly by means of an ATS surveillance system.

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

Note.— A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

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

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

Note.— The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

Automatic terminal information service (ATIS). The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

Bare Earth. Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

Calendar. Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108*).

* All ISO Standards referred to in this chapter are listed at the end of the chapter.

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.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications.

Culture. All man-made features constructed on the surface of the Earth, such as cities, railways and canals.

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.

Data accuracy. A degree of conformance between the estimated or measured value and the true value.

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

Data format. A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.

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

Data product. Data set or data set series that conforms to a data product specification (ISO 19131*).

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).

Note.— A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.

Data quality. A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution, integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

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

Data set. Identifiable collection of data (ISO 19101*).

Data set series. Collection of data sets sharing the same product specification (ISO 19115*).

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

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

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).

Digital Elevation Model (DEM). The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

Note.— Digital Terrain Model (DTM) is sometimes referred to as DEM.

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

Ellipsoid height (geodetic height). The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Feature. Abstraction of real world phenomena (ISO 19101*).

Feature attribute. Characteristic of a feature (ISO 19101*).

Note.— A feature attribute has a name, a data type and a value domain associated with it.

Feature operation. Operation that every instance of a feature type may perform (ISO 19110*).

Note.— An operation upon the feature type dam is to raise the dam. The result of this operation is to raise the level of water in the reservoir.

Feature relationship. Relationship that links instances of one feature type with instances of the same or a different feature type (ISO 19101*).

Feature type. Class of real world phenomena with common properties (ISO 19110*).

Note.— In a feature catalogue, the basic level of classification is the feature type.

Geodesic distance. The shortest distance between any two points on a mathematically defined ellipsoidal surface.

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

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

Note.— The geoid is irregular in shape because of local gravitational disturbances (wind tides, salinity, current, etc.) and the direction of gravity is perpendicular to the geoid at every point.

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

Note.— In respect to the World Geodetic System — 1984 (WGS-84) defined ellipsoid, the difference between the WGS-84 ellipsoidal height and orthometric height represents WGS-84 geoid undulation.

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108*).

Note.— In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

Height. The vertical distance of a level, point or an object considered as a point, measured from a specific datum.

Heliport. An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

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.

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.

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

International NOTAM office (NOF). An office designated by a State for the exchange of NOTAM internationally.

Logon address. A specified code used for data link logon to an ATS unit.

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.— A structured description of the content, quality, condition or other characteristics of data.

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

Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron

Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note 1.— The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.

Note 2.— The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

Next intended user. The entity that receives the aeronautical data or information from the aeronautical information service.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

Obstacle/terrain data collection surface. A defined surface intended for the purpose of collecting obstacle/terrain data.

Origination (aeronautical data or aeronautical information). The creation of the value associated with new data or information or the modification of the value of existing data or information.

Originator (aeronautical data or aeronautical information). An entity that is accountable for data or information origination and/or from which the AIS organization receives aeronautical data and aeronautical information.

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

Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note.— A required communication performance (RCP) specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note.— A required surveillance performance (RSP) specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Portrayal. Presentation of information to humans (ISO 19117*).

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

Post spacing. Angular or linear distance between two adjacent elevation points.

Precision. The smallest difference that can be reliably distinguished by a measurement process.

Note.— In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.

Pre-flight information bulletin (PIB). A presentation of current NOTAM information of operational significance, prepared prior to flight.

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.

Quality. Degree to which a set of inherent characteristics fulfils requirements (ISO 9000*).

Note 1.— The term “quality” can be used with adjectives such as poor, good or excellent.

Note 2.— “Inherent”, as opposed to “assigned”, means existing in something, especially as a permanent characteristic.

Quality assurance. Part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000*).

Quality control. Part of quality management focused on fulfilling quality requirements (ISO 9000*).

Quality management. Coordinated activities to direct and control an organization with regard to quality (ISO 9000*).

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.

Required communication performance (RCP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Requirement. Need or expectation that is stated, generally implied or obligatory (ISO 9000*).

Note 1.— “Generally implied” means that it is custom or common practice for the organization, its customers and other interested parties, that the need or expectation under consideration is implied.

Note 2.— A qualifier can be used to denote a specific type of requirement, e.g. product requirement, quality management requirement, customer requirement.

Note 3.— A specified requirement is one which is stated, for example, in a document.

Note 4.— Requirements can be generated by different interested parties.

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.

Route stage. A route or portion of a route flown without an intermediate landing.

SNOWTAM.[†] A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

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

Station declination. An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

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

Traceability. Ability to trace the history, application or location of that which is under consideration (ISO 9000*).

Note.— When considering product, traceability can relate to:

— the origin of materials and parts;

— the processing history; and

— the distribution and location of the product after delivery.

Validation. Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000*).

Verification. Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (ISO 9000*).

Note.— The term “verified” is used to designate the corresponding status.

VOLMET. Meteorological information for aircraft in flight.

Data link-VOLMET (D-VOLMET). Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link.

VOLMET broadcast. Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

[†] Applicable until 4 November 2020.

^{††} Applicable as of 5 November 2020.

1.2 Common reference systems for air navigation

1.2.1 Horizontal reference system

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

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 a 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' National Geospatial-Intelligence Agency'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 (1 σ).

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 WGS-84 (G1150) is referenced to the ITRF 2000 epoch. WGS-84 (G1150) is consistent with 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.

1.2.2 Vertical reference system

1.2.2.1 Mean sea level (MSL) datum 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.

1.2.2.2 The Earth Gravitational Model — 1996 (EGM-96) shall be used as the global gravity model for international air navigation.

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 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 concerning determination and reporting (accuracy of field work and data integrity) of elevation and geoid undulation at specific positions at aerodromes/heliports are given in the PANS-AIM (Doc 10066), Appendix 1.

1.2.3 Temporal reference system

1.2.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for international air navigation.

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

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

Note 3.— Guidance material relating to UTC is contained in Attachment D of Annex 5 — Units of Measurement to be Used in Air and Ground Operations.

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.*

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.*

1.3 Miscellaneous specifications

1.3.1 Aeronautical information products intended for international distribution shall include English text for those parts expressed in plain language.

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

1.3.3 **Recommendation.**— *Units of measurement used in the origination, processing and distribution of aeronautical data and aeronautical information should be consistent with the decision taken by the State in respect of the use of the tables contained in Annex 5.*

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

* ISO Standard
8601 — Data elements and interchange formats — Information interchange — Representation of dates and times
9000 — Quality Management Systems — Fundamentals and Vocabulary
19101 — Geographic information — Reference model
19104 — Geographic information — Terminology
19108 — Geographic information — Temporal schema
19109 — Geographic information — Rules for application schema
19110 — Geographic information — Feature cataloguing schema
19115 — Geographic information — Metadata
19117 — Geographic information — Portrayal
19131 — Geographic information — Data product specification

CHAPTER 2. RESPONSIBILITIES AND FUNCTIONS

2.1 State responsibilities

2.1.1 Each Contracting State shall:

- a) provide an aeronautical information service (AIS); 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 (ATS).

2.1.3 The State concerned shall remain responsible for the aeronautical data and aeronautical information provided in accordance with 2.1.2. Aeronautical data and aeronautical information provided for and on behalf of a State shall clearly indicate that they are provided under the authority of that State, irrespective of the format in which they are provided.

2.1.4 Each Contracting State shall ensure that the aeronautical data and aeronautical information provided are of required quality in accordance with 3.2.

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

Note.— The scope of aeronautical data and aeronautical information that would be the subject of formal arrangements is specified in Chapter 4.

2.2 AIS responsibilities and functions

2.2.1 An AIS shall ensure that aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation are made available in a form suitable for the operational requirements of the air traffic management (ATM) community, including:

- a) those involved in flight operations, including flight crews, flight planning and flight simulators; and
- b) the ATS unit responsible for flight information service and the services responsible for pre-flight information.

Note.— A description of the ATM community is contained in the Global Air Traffic Management Operational Concept (Doc 9854).

2.2.2 An AIS shall receive, collate or assemble, edit, format, publish/store and distribute aeronautical data and aeronautical information concerning the entire territory of the State as well as those areas over the high seas for which the State is responsible for the provision of ATS. Aeronautical data and aeronautical information shall be provided as aeronautical information products.

Note.— An AIS may include origination functions.

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 the AIS, plus a period of at least two hours before and after such a period. Service shall also be available at such other time as may be requested by an appropriate ground organization.

2.2.4 An AIS 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 AIS of other States; and
- b) from other sources that may be available.

Note.— One such source is the subject of a provision in 5.6.

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

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

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

2.3 Exchange of aeronautical data and aeronautical information

2.3.1 Each Contracting State shall designate the office to which all elements of aeronautical information products provided by other States shall be addressed. Such an office shall be qualified to deal with requests for aeronautical data and aeronautical information provided by other States.

2.3.2 **Recommendation.**— *Formal arrangements should be established between those parties providing aeronautical data and aeronautical information on behalf of the States and their users in relation to the provision of the service.*

Note.— Guidance material on such formal arrangements is contained in the Aeronautical Information Services Manual (Doc 8126).

2.3.3 Where more than one international NOTAM office is designated within a State, the extent of responsibility and the territory covered by each office shall be defined.

2.3.4 An AIS shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.

2.3.5 Wherever practicable, direct contact between AIS shall be established in order to facilitate the international exchange of aeronautical data and aeronautical information.

2.3.6 Except as provided in 2.3.8, one copy of each of the following aeronautical information products (where available) that have been requested by the AIS of a Contracting State shall be made available by the originating State and provided in the mutually agreed form(s), without charge, even where authority for publication/storage and distribution has been delegated to a non-governmental agency:

- a) Aeronautical Information Publication (AIP), including Amendments and Supplements;
- b) Aeronautical Information Circulars (AIC);
- c) NOTAM; and
- d) aeronautical charts.

2.3.7 **Recommendation.**— *The exchange of more than one copy of the elements of aeronautical information products, and other air navigation documents, including those containing air navigation legislation and regulations, should be subject to bilateral agreement between the participating Contracting States and entities.*

2.3.8 When aeronautical data and aeronautical information are provided in the form of digital data sets to be used by the AIS, they shall be provided on the basis of agreement between the Contracting States concerned.

Note.— *The intention is that States are able to access data for the purposes specified in 2.2.4.*

2.3.9 **Recommendation.**— *The procurement of aeronautical data and aeronautical information, including the elements of aeronautical information products, and other air navigation documents, including those containing air navigation legislation and regulations, by States other than Contracting States and by other entities should be subject to separate agreement between the participating States and entities.*

2.3.10 Globally interoperable aeronautical data and aeronautical information exchange models shall be used for the provision of data sets.

Note 1.— *Specifications concerning globally interoperable aeronautical data and aeronautical information exchange models are contained in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).*

Note 2.— *Guidance material on globally interoperable aeronautical data and aeronautical information exchange models is contained in Doc 8126.*

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 aeronautical information product which has been granted copyright protection by the originating State and provided to another State in accordance with 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.

2.4.2 When aeronautical data and aeronautical information are provided to a State in accordance with 2.3.8, the receiving State shall not provide the digital data sets of the providing State to any third party without the consent of the providing State.

2.5 Cost recovery

Recommendation.— *The overhead cost of collecting and compiling aeronautical data and aeronautical information 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 are recovered through airport and air navigation services charges, the charge to an individual customer for the supply of a particular aeronautical information product may be based on the costs of printing paper copies, production of electronic media and distribution.*

CHAPTER 3. AERONAUTICAL INFORMATION MANAGEMENT

3.1 Information management requirements

The information management resources and processes established by an aeronautical information service (AIS) shall be adequate to ensure the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the air traffic management (ATM) system.

3.2 Data quality specifications

3.2.1 Data accuracy

The order of accuracy for aeronautical data shall be in accordance with its intended use.

Note.— Specifications concerning the order of accuracy (including confidence level) for aeronautical data are contained in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), Appendix 1.

3.2.2 Data resolution

The order of resolution of aeronautical data shall be commensurate with the actual data accuracy.

Note 1.— Specifications concerning the resolution of aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

Note 2.— The resolution of the data contained in the database may be the same or finer than the publication resolution.

3.2.3 Data integrity

3.2.3.1 The integrity of aeronautical data shall be maintained throughout the data chain from origination to distribution to the next intended user.

Note.— Specifications concerning the integrity classification related to aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

3.2.3.2 Based on the applicable integrity classification, procedures shall be put in place in order to:

- 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 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 processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

3.2.4 Data traceability

Traceability of aeronautical data shall be ensured and retained as long as the data is in use.

3.2.5 Data timeliness

Timeliness of aeronautical data shall be ensured by including limits on the effective period of the data elements.

Note 1.— These limits may be associated with individual data elements or data sets.

Note 2.— If the effective period is defined for a data set, it will account for the effective dates of all of the individual data elements.

3.2.6 Data completeness

Completeness of aeronautical data shall be ensured in order to support its intended use.

3.2.7 Data format

The format of delivered aeronautical data shall be adequate to ensure that the data is interpreted in a manner that is consistent with its intended use.

3.3 Aeronautical data and aeronautical information verification and validation

3.3.1 Material to be issued as part of an aeronautical information product shall be thoroughly checked before it is submitted to the AIS in order to ensure that all necessary information has been included and that it is correct in detail.

3.3.2 An AIS shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements are met.

3.4 Data error detection

3.4.1 Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

3.4.2 Digital data error detection techniques shall be used in order to maintain the integrity levels as specified in 3.2.3.

Note.— Detailed specifications concerning digital data error detection techniques are contained in the PANS-AIM (Doc 10066).

3.5 Use of automation

3.5.1 Automation shall be applied in order to ensure the quality, efficiency and cost-effectiveness of aeronautical information services.

Note.— Guidance material on the development of databases and the establishment of data exchange services is contained in Doc 8126.

3.5.2 Due consideration to the integrity of data and information shall be given when automated processes are implemented and mitigating steps taken where risks are identified.

Note.— Risks of altering the integrity of data and information may be introduced by automated processes in cases of unexpected systems behaviours.

3.5.3 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.

3.6 Quality management system

3.6.1 Quality management systems shall be implemented and maintained encompassing all functions of an AIS, as outlined in 2.2. The execution of such quality management systems shall be made demonstrable for each function stage.

Note.— Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839) (planned for development by November 2019).

3.6.2 **Recommendation.**— *Quality management should be applicable to the whole aeronautical data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.*

3.6.3 **Recommendation.**— *The quality management system established in accordance with 3.6.1 should follow the ISO 9000 series of quality assurance standards and be certified by an accredited certification body.*

3.6.4 Within the context of the established quality management system, the competencies 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. Processes shall be in place to ensure that personnel possess the competencies required to perform specific assigned functions. 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 competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls in knowledge, skills and abilities.

3.6.5 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.

3.6.6 The established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements.

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

3.6.8 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.

3.7 Human factors considerations

3.7.1 The organization of an AIS as well as the design, contents, processing and distribution of aeronautical data and aeronautical information shall take into consideration human factors principles which facilitate their optimum utilization.

3.7.2 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, operating procedures or improvements in the operating environment.

CHAPTER 4. SCOPE OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

Note.— The scope of aeronautical data and aeronautical information provides the minimum requirement to support aeronautical information products and services, aeronautical navigation data bases, air navigation applications and air traffic management (ATM) systems.

4.1 Scope of aeronautical data and aeronautical information

4.1.1 The aeronautical data and aeronautical information to be received and managed by the aeronautical information service (AIS) shall include at least the following sub-domains:

- a) national regulations, rules and procedures;
- b) aerodromes and heliports;
- c) airspace;
- d) air traffic services (ATS) routes;
- e) instrument flight procedures;
- f) radio navigation aids/systems;
- g) obstacles;
- h) terrain; and
- i) geographic information.

Note 1.— Detailed specifications concerning the content of each sub-domain are contained in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), Appendix 1.

Note 2.— Aeronautical data and aeronautical information in each sub-domain may be originated by more than one organization or authority.

4.1.2 Determination and reporting of aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data.

Note.— Specifications concerning the accuracy and integrity classification related to aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

4.2 Metadata

4.2.1 Metadata shall be collected for aeronautical data processes and exchange points.

4.2.2 Metadata collection shall be applied throughout the aeronautical information data chain, from origination to distribution to the next intended user.

Note.— Detailed specifications concerning metadata are contained in the PANS-AIM (Doc 10066).

CHAPTER 5. AERONAUTICAL INFORMATION PRODUCTS AND SERVICES

5.1 General

5.1.1 Aeronautical information shall be provided in the form of aeronautical information products and associated services.

Note.— Specifications concerning the order of resolution of aeronautical data provided for each aeronautical information product are contained in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), Appendix 1.

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

5.2 Aeronautical information in a standardized presentation

5.2.1 Aeronautical information provided in a standardized presentation shall include the aeronautical information publication (AIP), AIP Amendments, AIP Supplements, AIC, NOTAM and aeronautical charts.

Note 1.— Detailed specifications about AIP, AIP Amendments, AIP Supplements, AIC and NOTAM are contained in the PANS-AIM (Doc 10066).

Note 2.— Cases where digital data sets may replace the corresponding elements of the standardized presentation are detailed in the PANS-AIM (Doc 10066).

5.2.1.1 The AIP, AIP Amendment, AIP Supplement and AIC shall be provided on paper and/or as an electronic document.

5.2.1.2 **Recommendation.**— *The AIP, AIP Amendment, AIP Supplement and AIC when provided as an electronic document (eAIP) should allow for both displaying on electronic devices and printing on paper.*

5.2.2 Aeronautical Information Publication

Note 1.— The AIP is intended primarily to satisfy international requirements for the exchange of aeronautical information of a lasting character essential to air navigation.

Note 2.— The AIP constitutes the basic information source for permanent information and long duration temporary changes.

AIP shall include:

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

- b) the general conditions under which the services or facilities are available for international use;
- c) a list of significant differences between the national regulations and practices of the State and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to differentiate readily between the requirements of the State and the related ICAO provisions;
- d) the choice made by a State in each significant case where an alternative course of action is provided for ICAO Standards, Recommended Practices and Procedures.

5.2.3 AIP Supplement

A checklist of valid AIP Supplements shall be regularly provided.

Note.— Detailed specifications concerning the frequency for providing checklists of valid AIP Supplements are contained in the PANS-AIM (Doc 10066).

5.2.4 Aeronautical Information Circulars

5.2.4.1 An AIC shall be used to provide:

- a) a long-term forecast of any major change in legislation, regulations, procedures or facilities; or
- b) information of a purely explanatory or advisory nature liable to affect flight safety; or
- c) information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters.

5.2.4.2 An AIC shall not be used for information that qualifies for inclusion in AIP and NOTAM.

5.2.4.3 The validity of AIC currently in force shall be reviewed at least once a year.

5.2.4.4 A checklist of currently valid AIC shall be regularly provided.

Note.— Detailed specifications concerning the frequency for providing checklists of valid AIC are contained in the PANS-AIM (Doc 10066).

5.2.5 Aeronautical charts

Note.— Annex 4 — Aeronautical Charts provides Standards and Recommended Practices including provision requirements for each chart type.

5.2.5.1 The aeronautical charts listed below shall, when available for designated international aerodromes/heliports, form part of the AIP, or be provided separately to recipients of the AIP:

- a) Aerodrome/Heliport Chart — ICAO;
- b) Aerodrome Ground Movement Chart — ICAO;
- c) Aerodrome Obstacle Chart — ICAO Type A;

- d) Aerodrome Obstacle Chart — ICAO Type B (when available);
- e) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- f) Aircraft Parking/Docking Chart — ICAO;
- g) Area Chart — ICAO;
- h) ATC Surveillance Minimum Altitude Chart — ICAO;
- i) Instrument Approach Chart — ICAO;
- j) Precision Approach Terrain Chart — ICAO;
- k) Standard Arrival Chart — Instrument (STAR) — ICAO;
- l) Standard Departure Chart — Instrument (SID) — ICAO; and
- m) Visual Approach Chart — ICAO.

Note.— A page pocket may be used in the AIP to include the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) on appropriate electronic media.

5.2.5.2 The Enroute Chart — ICAO shall, when available, form part of the AIP, or be provided separately to recipients of the AIP.

5.2.5.3 The aeronautical charts listed below shall, when available, be provided as aeronautical information products:

- a) World Aeronautical Chart — ICAO 1:1 000 000;
- b) Aeronautical Chart — ICAO 1:500 000;
- c) Aeronautical Navigation Chart — ICAO Small Scale; and
- d) Plotting Chart — ICAO chart.

5.2.5.4 **Recommendation.**— *Electronic aeronautical charts should be provided based on digital databases and the use of geographic information systems.*

5.2.5.5 The chart resolution of aeronautical data shall be that as specified for a particular chart.

Note.— Specifications concerning the chart resolution for aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

5.2.6 NOTAM

Note.— Detailed specifications for NOTAM, including formats for SNOWTAM and ASHTAM, are contained in the PANS-AIM (Doc 10066).

A checklist of valid NOTAM shall be regularly provided.

Note.— Detailed specifications concerning the frequency for providing checklists of valid NOTAM are contained in the PANS-AIM (Doc 10066).

5.3 Digital data sets

5.3.1 General

5.3.1.1 Digital data shall be in the form of the following data sets:

- a) AIP data set;
- b) terrain data sets;
- c) obstacle data sets;
- d) aerodrome mapping data sets; and
- e) instrument flight procedure data sets.

Note.— Detailed specifications concerning the content of the digital data sets are contained in the PANS-AIM (Doc 10066).

5.3.1.2 Each data set shall be provided to the next intended user together with at least the minimum set of metadata that ensures traceability.

Note.— Detailed specifications concerning metadata are contained in the PANS-AIM (Doc 10066).

5.3.1.3 A checklist of valid data sets shall be regularly provided.

5.3.2 AIP data set

5.3.2.1 **Recommendation.**— *An AIP data set should be provided covering the extent of information as provided in the AIP.*

5.3.2.2 **Recommendation.**— *When it is not possible to provide a complete AIP data set, the data subset(s) that are available should be provided.*

5.3.2.3 The AIP data set shall contain the digital representation of aeronautical information of lasting character (permanent information and long duration temporary changes) essential to air navigation.

5.3.3 Terrain and obstacle data sets

Note 1.— Numerical requirements for terrain and obstacle data sets are contained in the PANS AIM (Doc 10066), Appendices 1 and 8.

Note 2.— Requirements for terrain and obstacle data collection surfaces are contained in the PANS-AIM (Doc 10066), Appendix 8.

5.3.3.1 The coverage areas for terrain and obstacle data sets shall be specified as:

- Area 1: the entire territory of a State;
- Area 2: within the vicinity of an aerodrome, subdivided as follows:
 - Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists;

Note.— See Annex 14, Volume I, Chapter 3, for dimensions for runway strips.

- Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;
 - Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and
 - Area 2d: an area outside Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing terminal control area (TMA) boundary, whichever is nearest;
- Area 3: the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway centre line and 50 m from the edge of all other parts of the aerodrome movement area; and
- Area 4: the area extending 900 m prior to the runway threshold and 60 m each side of the extended runway centre line in the direction of the approach on a precision approach runway, Category II or III.

5.3.3.2 **Recommendation.**— *Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant, the length of Area 4 should be extended to a distance not exceeding 2 000 m (6 500 ft) from the runway threshold.*

5.3.3.3 Terrain data sets

5.3.3.3.1 Terrain data sets shall contain the digital representation of the terrain surface in the form of continuous elevation values at all intersections (points) of a defined grid, referenced to common datum.

5.3.3.3.2 Terrain data shall be provided for Area 1.

5.3.3.3.3 For aerodromes regularly used by international civil aviation, terrain data shall be provided for:

- a) Area 2a;
- b) the take-off flight path area; and
- c) an area bounded by the lateral extent of the aerodrome obstacle limitation surfaces.

5.3.3.3.4 **Recommendation.**— *For aerodromes regularly used by international civil aviation, additional terrain data should be provided within Area 2 as follows:*

- a) *in the area extending to a 10-km radius from the ARP; and*
- b) *within the area between 10 km and the TMA boundary or a 45-km radius (whichever is smaller), where terrain penetrates a horizontal terrain data collection surface specified as 120 m above the lowest runway elevation.*

5.3.3.3.5 **Recommendation.**— *Arrangements should be made for coordinating the provision of terrain data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same terrain is correct.*

5.3.3.3.6 **Recommendation.**— *For those aerodromes located near territorial boundaries, arrangements should be made among States concerned to share terrain data.*

5.3.3.3.7 **Recommendation.**— *For aerodromes regularly used by international civil aviation, terrain data should be provided for Area 3.*

5.3.3.3.8 For aerodromes regularly used by international civil aviation, terrain data shall be provided for Area 4 for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.

5.3.3.3.9 **Recommendation.**— *Where additional terrain data is collected to meet other aeronautical requirements, the terrain data sets should be expanded to include this additional data.*

5.3.3.4 Obstacle data sets

5.3.3.4.1 Obstacle data sets shall contain the digital representation of the vertical and horizontal extent of obstacles.

5.3.3.4.2 Obstacle data shall not be included in terrain data sets.

5.3.3.4.3 Obstacle data shall be provided for obstacles in Area 1 whose height is 100 m or higher above ground.

5.3.3.4.4 For aerodromes regularly used by international civil aviation, obstacle data shall be provided for all obstacles within Area 2 that are assessed as being a hazard to air navigation.

5.3.3.4.5 For aerodromes regularly used by international civil aviation, obstacle data shall be provided for:

- a) Area 2a for those obstacles that penetrate an obstacle data collection surface outlined by a rectangular area around a runway that comprises the runway strip plus any clearway that exists. The Area 2a obstacle collection surface shall have a 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) 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 are specified in Annex 4, 3.8.2. Aerodrome obstacle limitation surfaces are specified in Annex 14, Volume 1, Chapter 4.

5.3.3.4.6 **Recommendation.**— For aerodromes regularly used by international civil aviation, obstacle data should be provided for Areas 2b, 2c and 2d for obstacles that penetrate the relevant obstacle data collection surface specified as follows:

- a) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side. The Area 2b obstacle collection surface has a 1.2 per cent 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 per cent to each side;
- b) 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 per cent 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 has the elevation of the point of Area 2a at which it commences; and
- c) Area 2d: an area outside Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground;

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.

5.3.3.4.7 **Recommendation.**— Arrangements should be made for coordinating the provision of obstacle data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same obstacle is correct.

5.3.3.4.8 **Recommendation.**— For those aerodromes located near territorial boundaries, arrangements should be made among States concerned to share obstacle data.

5.3.3.4.9 **Recommendation.**— For aerodromes regularly used by international civil aviation, obstacle data should be provided for Area 3 for obstacles that penetrate the relevant obstacle data collection surface extending a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.

5.3.3.4.10 For aerodromes regularly used by international civil aviation, obstacle data shall be provided for Area 4 for all runways where precision approach Category II or III operations have been established.

5.3.3.4.11 **Recommendation.**— Where additional obstacle data is collected to meet other aeronautical requirements, the obstacle data sets should be expanded to include this additional data.

5.3.4 Aerodrome mapping data sets

5.3.4.1 Aerodrome mapping data sets shall contain the digital representation of aerodrome features.

Note.— 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.

5.3.4.2 **Recommendation.**— Aerodrome mapping data sets should be made available for aerodromes regularly used by international civil aviation.

5.3.5 Instrument flight procedure data sets

5.3.5.1 Instrument flight procedure data sets shall contain the digital representation of instrument flight procedures.

5.3.5.2 **Recommendation.**— *Instrument flight procedure data sets should be made available for aerodromes regularly used by international civil aviation.*

5.4 Distribution services

5.4.1 General

5.4.1.1 Aeronautical information products shall be distributed to authorized users who request them.

5.4.1.2 AIP, AIP Amendments, AIP Supplements and AIC shall be made available by the most expeditious means.

5.4.1.3 **Recommendation.**— *Global communication networks such as the Internet should, whenever practicable, be employed for the provision of aeronautical information products.*

5.4.2 NOTAM distribution

5.4.2.1 NOTAM shall be distributed on the basis of a request.

5.4.2.2 NOTAM shall be prepared in conformity with the relevant provisions of the ICAO communication procedures.

5.4.2.3 The aeronautical fixed service (AFS) shall, whenever practicable, be employed for NOTAM distribution.

5.4.2.4 When a NOTAM is sent by means other than the AFS, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator shall be used, preceding the text. The originating State shall select the NOTAM that are to be given international distribution.

5.4.2.5 International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices concerned, and between the NOTAM offices and multinational NOTAM processing units.

5.4.2.6 The originating State shall, upon request, grant distribution of NOTAM series other than those distributed internationally.

5.4.2.7 **Recommendation.**— *Selective distribution lists should be used when practicable.*

Note.— *Guidance material relating to selective distribution lists is contained in the Aeronautical Information Services Manual (Doc 8126).*

5.5 Pre-flight information service

5.5.1 For any aerodrome/heliport used for international air operations, aeronautical information relative to the route stages originating at the aerodrome/heliport shall be made available to flight operations personnel, including flight crews and services responsible for pre-flight information.

5.5.2 Aeronautical information provided for pre-flight planning purposes shall include information of operational significance from the elements of aeronautical information products.

Note 1.— The elements of aeronautical information products may be limited to national publications and when practicable, those of adjacent States, provided a complete library of aeronautical information is available at a central location and means of direct communications are available with that library.

Note 2.— A recapitulation of valid NOTAM of operational significance and other information of urgent character may be made available to flight crews in the form of plain-language pre-flight information bulletins (PIB). Guidance material on the preparation of PIB is contained in Doc 8126.

5.6 Post-flight information service

5.6.1 For any aerodrome/heliport used for international air operations, arrangements shall be made to receive information concerning the state and operation of air navigation facilities or services noted by flight crews.

5.6.2 The arrangements specified in 5.6.1 shall ensure that such information is made available to the aeronautical information service (AIS) for distribution as the circumstances necessitate.

5.6.3 For any aerodrome/heliport used for international air operations, arrangements shall be made to receive information concerning the presence of wildlife hazards observed by flight crews.

5.6.4 The information about presence of wildlife hazards shall be made available to the aeronautical information service for distribution as the circumstances necessitate.

Note.— See Annex 14, Volume I, Chapter 9, Section 9.4.

CHAPTER 6. AERONAUTICAL INFORMATION UPDATES

6.1 General specifications

Aeronautical data and aeronautical information shall be kept up to date.

6.2 Aeronautical information regulation and control (AIRAC)

6.2.1 Information concerning the following circumstances shall be distributed under the regulated system (AIRAC), i.e. basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of 28 days, including 8 November 2018:

- a) limits (horizontal and vertical), regulations and procedures applicable to:
 - 1) flight information regions;
 - 2) control areas;
 - 3) control zones;
 - 4) advisory areas;
 - 5) air traffic services (ATS) routes;
 - 6) permanent danger, prohibited and restricted areas (including type and periods of activity when known) and air defence identification zones (ADIZ);
 - 7) permanent areas or routes or portions thereof where the possibility of interception exists;
- b) positions, frequencies, call signs, identifiers, known irregularities and maintenance periods of radio navigation aids, and communication and surveillance facilities;
- c) holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures;
- d) transition levels, transition altitudes and minimum sector altitudes;
- e) meteorological facilities (including broadcasts) and procedures;
- f) runways and stopways;
- g) taxiways and aprons;
- h) aerodrome ground operating procedures (including low visibility procedures);

- i) approach and runway lighting; and
- j) aerodrome operating minima if published by a State.

6.2.2 The information notified under the AIRAC system shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

6.2.3 Information provided under the AIRAC system shall be made available by the aeronautical information service (AIS) so as to reach recipients at least 28 days in advance of the effective date.

Note.— AIRAC information is distributed by the AIS unit at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

6.2.4 When information has not been submitted by the AIRAC date, a NIL notification shall be distributed not later than one cycle before the AIRAC effective date concerned.

6.2.5 Implementation dates other than AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work and/or for updating of navigation databases.

6.2.6 **Recommendation.**— *The regulated system (AIRAC) should be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the circumstances listed below:*

- a) position, height and lighting of navigational obstacles;
- b) hours of service of aerodromes, facilities and services;
- c) customs, immigration and health services;
- d) temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft; and
- e) temporary areas or routes or portions thereof where the possibility of interception exists.

6.2.7 **Recommendation.**— *Whenever major changes are planned and where advance notice is desirable and practicable, information should be made available by the AIS so as to reach recipients 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 below, and other major changes if deemed necessary:*

- a) new aerodromes for international instrument flight rules (IFR) operations;
- b) new runways for IFR operations at international aerodromes;
- c) design and structure of the ATS route network;
- d) design and structure of a set of terminal procedures (including change of procedure bearings due to magnetic variation change);
- e) circumstances listed in 6.2.1 if the entire State or any significant portion thereof is affected or if cross-border coordination is required.

Note.— Guidance material on what constitutes a major change is included in the Aeronautical Information Services Manual (Doc 8126).

6.3 Aeronautical information product updates

6.3.1 AIP updates

6.3.1.1 The aeronautical information publication (AIP) shall be amended or reissued at such regular intervals as may be necessary to keep it up to date.

6.3.1.2 Permanent changes to the AIP shall be published as AIP Amendments.

6.3.1.3 Temporary changes of long duration (three months or longer) and information of short duration which contains extensive text and/or graphics shall be published as AIP Supplements.

6.3.2 NOTAM

6.3.2.1 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a Trigger NOTAM shall be originated.

Note.— Detailed specifications concerning the Trigger NOTAM are contained in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).

6.3.2.2 A NOTAM shall be originated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration, or when operationally significant permanent changes or temporary changes of long duration are made at short notice, except for extensive text and/or graphics.

6.3.2.3 A NOTAM shall be originated and issued concerning the following information:

- a) establishment, closure or significant changes in operation of aerodrome(s) or heliport(s) or runways;
- b) establishment, withdrawal or significant changes in operation of aeronautical services (aerodromes, AIS, ATS, communications, navigation and surveillance (CNS), meteorology (MET), search and rescue (SAR), etc.);
- c) establishment, withdrawal or significant changes in operational capability of radio navigation and air-ground communication services. This includes: interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation and air-ground communication services or limitations of relay stations including operational impact, affected service, frequency and area;
- d) unavailability of back-up and secondary systems, having a direct operational impact;
- e) establishment, withdrawal or significant changes to visual aids;
- f) interruption of or return to operation of major components of aerodrome lighting systems;
- g) establishment, withdrawal or significant changes to procedures for air navigation services;
- h) occurrence or correction of major defects or impediments in the manoeuvring area;
- i) changes to and limitations on availability of fuel, oil and oxygen;

- j) major changes to search and rescue facilities and services available;
- k) establishment, withdrawal or return to operation of hazard beacons marking obstacles to air navigation;
- l) changes in regulations requiring immediate action, e.g. prohibited areas for SAR action;
- m) presence of hazards which affect air navigation (including obstacles, military exercises, displays, fireworks, sky lanterns, rocket debris, races and major parachuting events outside promulgated sites);
- n) planned laser emissions, laser displays and search lights if pilots' night vision is likely to be impaired;
- o) erecting or removal of, or changes to, obstacles to air navigation in the take-off/climb, missed approach, approach areas and runway strip;
- p) establishment or discontinuance (including activation or deactivation) as applicable, or changes in the status of prohibited, restricted or danger areas;
- q) establishment or discontinuance of areas or routes or portions thereof where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;
- r) allocation, cancellation or change of location indicators;
- s) changes in aerodrome/heliport rescue and firefighting category provided (see Annex 14, Volume I, Chapter 9, and Attachment A, Section 17);
- t) presence or removal of, or significant changes in, hazardous conditions due to snow, slush, ice, radioactive material, toxic chemicals, volcanic ash deposition or water on the movement area;
- u) outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;
- v) observations or forecasts of space weather phenomena, the date and time of their occurrence, the flight levels where provided and portions of the airspace which may be affected by the phenomena;
- w) an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions and/or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;
- x) release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions thereof which could be affected and the direction of movement;
- y) establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with procedures and/or limitations which affect air navigation; and
- z) implementation of short-term contingency measures in cases of disruption, or partial disruption, of ATS and related supporting services.

Note.— See Annex 11, 2.31 and Attachment C to that Annex.

6.3.2.4 The following information shall not be notified by NOTAM:

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

- b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- c) temporary obstructions in the vicinity of aerodromes/heliports that do not affect the safe operation of aircraft;
- d) partial failure of aerodrome/heliport lighting facilities where such failure does not directly affect aircraft operations;
- e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative;
- f) the lack of apron marshalling services and road traffic control;
- g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;
- h) parachuting when in uncontrolled airspace under VFR (see 6.3.2.3 m)), when controlled, at promulgated sites or within danger or prohibited areas;
- i) training activities by ground units;
- j) unavailability of back-up and secondary systems if these do not have an operational impact;
- k) limitations to airport facilities or general services with no operational impact;
- l) national regulations not affecting general aviation;
- m) announcement or warnings about possible/potential limitations, without any operational impact;
- n) general reminders on already published information;
- o) availability of equipment for ground units without containing information on the operational impact for airspace and facility users;
- p) information about laser emissions without any operational impact and fireworks below minimum flying heights;
- q) closure of movement area parts in connection with planned work locally coordinated of duration of less than one hour;
- r) closure or unavailability of, or changes in, operation of aerodrome(s)/heliport(s) outside the aerodrome(s)/heliport(s) operational hours; and
- s) other non-operational information of a similar temporary nature.

Note.— Information which relates to an aerodrome and its vicinity and does not affect its operational status may be distributed locally during pre-flight or in-flight briefing or other local contact with flight crews.

6.3.3 Data set updates

6.3.3.1 Data sets shall be amended or reissued at such regular intervals as may be necessary to keep them up to date.

6.3.3.2 Permanent changes and temporary changes of long duration (three months or longer) made available as digital data shall be issued in the form of a complete data set or a subset that includes only the differences from the previously issued complete data set.

6.3.3.3 **Recommendation.**— *When made available as a completely reissued data set, the differences from the previously issued complete data set should be indicated.*

6.3.3.4 **Recommendation.**— *When temporary changes of short duration are made available as digital data (digital NOTAM), they should use the same aeronautical information model as the complete data set.*

6.3.3.5 Updates to AIP and digital data sets shall be synchronized.

— END —

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