New Annex 15

(Consolidated draft, 14 OCT 2015)
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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 and data link systems. 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 Aeronautical Information Management (PANS-AIM, Doc XXXX).

Note 4. — Guidance material on the organization and operation of aeronautical information services 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 aeronautical information services, they have the following meanings:

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

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

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

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

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

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
— 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 (ATS).

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

**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.

**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.

**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.

**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.

**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:

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1. * All ISO Standards are listed at the end of this chapter.
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*).

**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.

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

*Note.* For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

**Data catalogue.** A listing of data subjects that are in the scope of AIS, including their description, properties, data types and data quality requirements, as applicable.

**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 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 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.

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

**Data set series.** Collection of data sets sharing the same product specification (ISO 19115*).
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). A degree of assurance that aeronautical data and its value has not been lost or altered since origination or authorized amendment:

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 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 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 a new data item or the modification of the value of an existing data item.

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

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

**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.

**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.

**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.

**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.

**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.

**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.

Note.— In practical terms, depending on the method of data collection used, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as “first reflective surface”.

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

Note 2.— Confirmation can comprise activities such as:
— performing alternative calculations;
— comparing a new design specification with a similar proven design specification;
— undertaking tests and demonstrations; and
— reviewing documents prior to issue.

**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.

### 1.2 Common reference systems for air navigation

#### 1.2.1 Horizontal reference system

1.2.1.1 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation and published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.
1.2.1  **Recommendation.**— In precise geodetic applications and some air navigation applications, temporal changes in the tectonic plate motion and tidal effects on the Earth’s crust should be modelled and estimated. To reflect the temporal effect, an epoch should be included with any set of absolute station coordinates.

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

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

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

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 by international air navigation as the global gravity model.

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

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

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

1.2.3  **Temporal reference system**

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

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

Note 2.— Coordinated Universal Time (UTC) is a time scale maintained by the Bureau International de l’Heure (BIH) and the IERS and forms the basis of a coordinated dissemination of standard frequencies and time signals.
Note 3.— See Attachment D of Annex 5 for guidance material relating to UTC.

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

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 — Units of Measurement to be Used in Air and Ground Operations.

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

1.4 Language proficiency

An Aeronautical Information Service provider shall ensure that AIS staff have an English language proficiency level 4 on the ICAO rating scale.

* ISO Standard
9000 — Quality Management Systems — Fundamentals and Vocabulary
1901 — Geographic information — Reference model
1904 — Geographic information — Terminology
1908 — Geographic information — Temporal schema
1909 — 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

Comment [10]: As agreed following SN 11/18
Comment [11]: Hanoi meeting conclusion: Propose to remove ‘level 4 on the ICAO rating scale’ as this rating scale is focused on ATCO/Pilot operational exchange
Comment [12]: Alex Petrovsky (Eurocontrol): Does it make sense to link this to the ICAO rating scale? This one is for radiotelephony only, which is not the case for AIS.
Comment [13]: Including a level it’s only to have some parameters ....For example the test for ATCO it’s not the same for Aeronautical Radio Operators, they adapt the test and that can be done for AIS. Not including a level mean’s an abstract proficiency
Comment [14]: the other proposal was : "An aeronautical information service provider shall ensure that AIS staff speak and understand the English language to a level of proficiency considered as minimum," and this one was not approved
CHAPTER 2. RESPONSIBILITIES AND FUNCTIONS

2.1 State responsibilities

2.1.1 Each Contracting State shall:

a) provide an aeronautical information service; or

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

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

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

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 it is provided.

2.1.4 Each Contracting State shall ensure that the aeronautical data and aeronautical information provided is complete, timely and of required quality in accordance with 3.3.

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

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

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

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

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

2.2.2 An aeronautical information service 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 in which the State is responsible for the provision of air traffic services. Aeronautical data and aeronautical information shall be provided as aeronautical information products.

[Note]—An aeronautical information service 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 an aeronautical information service, plus a period of at least two hours before and after such a period. The service shall also be available at such other time as may be requested by an appropriate ground organization.

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

a) from the aeronautical information services of other States;

b) from other sources that may be available.
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 State of Origin.

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 aeronautical information service shall promptly make available to the aeronautical information services 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 State shall designate the office to which all aeronautical information products originated provided by other States shall be addressed. Such an office shall be qualified to deal with requests for aeronautical data and aeronautical information originated provided by other States.

2.3.2 Recommendation — Formal arrangements should be established between those parties providing 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 may be found in ...

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 aeronautical information service 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 aeronautical information services 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 aeronautical information service of an ICAO Contracting State shall be made available by the originating State 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:

- Aeronautical Information Publication (AIP), including Amendments and Supplements
- Aeronautical Information Circulars (AIC)
- NOTAM

2.3.7 Recommendation. — The exchange of more than one copy of the elements of the 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 States and entities.

2.3.8 Where aeronautical information and aeronautical data is provided in the form of digital data sets to be used by Aeronautical Information Services, it shall be provided on the basis of agreement between the concerned Contracting States.

Note. — The intention is that States are able to access foreign 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 the aeronautical information products, and other air navigation documents, including those containing air navigation legislation and regulations, by States other than ICAO Contracting States and by other entities should be subject to separate agreement between the participating States and entities.

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 State and provided to another State in accordance with 2.3, such products 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 State.

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

2.5 Cost recovery

2.5.1 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 airports and air navigation services charges, the charge to an individual customer for the supply of a particular AIS product may be based on the costs of printing paper copies, production of electronic media, and costs of distribution.
CHAPTER 3. AERONAUTICAL INFORMATION MANAGEMENT

3.1 Information management requirements

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

3.2 Data quality specifications

3.2.1 Accuracy

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

Note.— Specifications governing the order of accuracy for aeronautical data are provided in the Data Catalogue contained in PANS-AIM

3.2.2 Resolution

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

Note: Specifications governing the publication resolution of the data are specified in the Data Catalogue contained in PANS-AIM

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

3.2.3 Integrity

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

Note: Specifications governing the integrity classification related to aeronautical data are provided in the Data Catalogue contained in PANS-AIM

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

c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance 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 Traceability

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

Note - Configuration management is essential for compliance with traceability requirements.

3.2.5 Timeliness

3.2.5.1 Timeliness shall be ensured by including limitations on the effective period with 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 should account for the effective dates of all of the individual data elements.

3.2.6 Completeness

3.2.6.1 Completeness of the aeronautical data shall be ensured in order to support the intended use.
3.2.7 Format

3.2.7.1 The format of delivered data shall be adequate to ensure that the data is interpreted in a manner that is consistent with the intent of the data.

3.3 Aeronautical data and aeronautical information validation and verification

3.3.1 Material to be issued as aeronautical information product shall be thoroughly checked before it is submitted to the aeronautical information service, in order to make certain that all necessary information has been included and that it is correct in detail prior to distribution.

3.3.2 An aeronautical information service 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 Aeronautical digital data sets shall be protected against loss or alteration of data by the application of a data integrity protection mechanism. This shall apply to the protection of the integrity classification of data set as specified in § 1.1 Definitions at "Integrity classification (aeronautical data)."

3.5 Use of automation

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

Note.— Guidance on the development of databases and the establishment of data exchange services is contained in the Aeronautical Information Services Manual (Doc 8126).

3.5.2 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 aeronautical information service, 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).

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

3.6.3 Recommendation.— The quality management system established in accordance with 3.6.1 should follow the International Organization for Standardization (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 are traceable throughout the aeronautical information data

Comment [16]: AIS-AIMSG11 - Removed as traceability is now included in the definition of data quality + AIS cannot V&V accuracy

Comment [17]: According to Flimsy 11/5.

Comment [18]: Hanoi meeting conclusion - Suggestion to remove 3.4.2 as 3.4 is about error detection and not protection.

Comment [19]: Why don't we call the paragraph "Data Protection" then?
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 Safety management

3.7.1 A safety process shall be established to demonstrate commitment to safety management in order to meet defined safety objectives.

3.7.2 Safety management activities shall, as a minimum:

a. ensure hazards and safety risks associated with changes to AIM processes, procedures, resources and systems are assessed and mitigated;
b. ensure that review and monitoring processes are in place to identify potential safety issues;
c. ensure that procedures are in place to assess and mitigate safety risks to aviation arising from data and information errors;
d. identify roles and responsibilities within the organisation for the performance of the safety management functions;
e. promote awareness of safety by involving all personnel to identify safety issues and propose solutions to identified safety issues;
f. document procedures relating to safety management activities and
g. ensure that records pertaining to safety management performance are kept.

Note 1 — The above activities may be included in the implementation of a Safety Management System as described in Annex 19 Safety Management and detailed in the Safety Management Manual (SMM) (Doc 9859).

Note 2 — Guidance pertaining to the relationship between SMS and QMS may be found in the PANS-AIM and in the QMS Manual (Doc 9839).

3.8 Human Factors considerations

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

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

Note.— This may be accomplished through the design of systems, through operating procedures or through improvements in the operating environment.
CHAPTER 4 - SCOPE OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

Note 1 — The scope of aeronautical data and aeronautical information that is managed by an AIS is described in this chapter.

Note 2 — 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 ATM systems.

Note 3 — Aeronautical data and aeronautical information in each sub-domain may be originated by more than one organization or authority.

4.1 Origination of aeronautical data and aeronautical information

4.1.1 The aeronautical data and aeronautical information originated in the following sub-domains shall include:

a) National regulations, rules and procedures;

b) Aerodromes and heliports;

c) Airspace;

d) ATS routes;

e) Instrument flight procedures;

f) Radio navigation aids/systems;

g) Obstacles; and

h) Geographic information.

Note. — The contents of each sub-domain are described fully in Appendix 1 to the PANS-AIM.

4.1.2 Determination and reporting of aeronautical data shall be in accordance with the required accuracy and integrity classification.

Note. — Specifications governing the accuracy requirements and integrity classification related to aeronautical data are contained in the Data Catalogue

4.1.3 Originators shall take into account accuracy requirements and integrity classification for aeronautical data.

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. — The metadata requirement is not intended to contradict existing privacy regulations.
CHAPTER 5 - AERONAUTICAL INFORMATION PRODUCTS AND SERVICES

5.1 Aeronautical information shall be provided in the form of Aeronautical Information Products and associated services.

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

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

5.3 Aeronautical data shall be [published] in accordance with the resolution requirements.

Note. — Specifications governing the order of resolution for aeronautical data are provided in the Data Catalogue contained in PANS-AIM

5.4 Aeronautical data shall be provided in accordance with the integrity classification.

Note: Specifications governing the integrity classification for aeronautical data are provided in the Data Catalogue contained in PANS-AIM

5.5 Geographical coordinates whose accuracy does not meet the requirements shall be identified.

5.3 Aeronautical information in a standardized presentation

5.3.1 The AIP, AIP Amendment, AIP Supplement and AIC shall be provided on paper and/or as an electronic document “Electronic AIP” (eAIP) that allows for both displaying on a computer screen and printing on paper.

5.3.2 Aeronautical Information Publication (AIP)

5.3.2.1 An Aeronautical Information Publication and its Amendments shall contain aeronautical information of lasting character (permanent information and long duration temporary changes) essential to air navigation.

5.3.2.2 Aeronautical Information Publications 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 in ICAO Standards, Recommended Practices and Procedures.

5.3.3 AIP Supplement

5.3.3.1 AIP Supplement shall contain temporary changes to the information contained in the AIP provided by means of distinctive special pages.

5.3.3.2 A checklist of valid AIP Supplements shall be provided at intervals of not more than one month.

5.3.4 Aeronautical Information Circulars (AIC)
5.3.4.1 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.

5.3.4.2 An AIC shall not be used for information that qualifies for inclusion in AIP or NOTAM.

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

5.3.4.4 A checklist of the currently valid AIC shall be provided at least once a year, with distribution as for the AIC.

5.3.5 Aeronautical Charts

Note 1. — Annex 4 provides standards and recommended practices including provision requirements for each chart type.

5.3.5.1 The aeronautical charts listed alphabetically below shall, when made 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 Terrain and Obstacle Chart — ICAO (Electronic);
e) Aircraft Parking/Docking Chart — ICAO;
f) Area Chart — ICAO;
g) ATC Surveillance Minimum Altitude Chart — ICAO;
h) Instrument Approach Chart — ICAO;
i) Precision Approach Terrain Chart — ICAO;
j) Standard Arrival Chart — Instrument (STAR) — ICAO;
k) Standard Departure Chart — Instrument (SID) — ICAO;
l) Visual Approach Chart — ICAO.

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

5.3.5.3 The aeronautical charts listed alphabetically below shall, when available, be provided as Aeronautical Information Products:

a) Aerodrome Obstacle Chart — ICAO Type B;
b) The World Aeronautical Chart — ICAO 1:1 000 000;
c) The Aeronautical Chart — ICAO 1:500 000

d) The Aeronautical Navigation Chart — ICAO Small Scale

e) The Plotting Chart — ICAO chart

f) Electronic Aeronautical Chart Display — ICAO

Comment [24]: SN 10/21

Comment [25]: Alex Petrovsky (Eurocontrol): This "chart" was proposed (in ICAO groups) to be removed from Annex 4, because it is not so much a chart but a display hardware.
5.3.5.4 Aeronautical data shall be provided in accordance with the charting resolution requirements.

Note 1. — Specifications governing the order of charting resolution for aeronautical data are provided in the Data Catalogue contained in PANS-AIM.

5.3.6 NOTAM

5.3.6.1 A NOTAM shall contain 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.

Note. — Detailed specifications for NOTAM, including formats for SNOWTAM and ASHTAM, are contained in PANS-AIM.

5.3.6.2 A checklist of valid NOTAM shall be provided at intervals of not more than one month.

5.3.6.3 One checklist NOTAM shall be provided for each series.

5.4 Digital data

5.4.1 When provided, digital data shall be in the form of the following data sets:

a) Aeronautical (AIP) data set;

b) Terrain data sets;

c) Obstacle data sets;

d) Aerodrome mapping data sets; and

e) Instrument flight procedure data sets.

5.4.2 Each data set shall include the minimum set of metadata that needs to be provided to the next intended user.

5.4.3 Aeronautical (AIP) data set

5.4.3.1 The Aeronautical (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.

Note. — The exact content of the Aeronautical (AIP) data set is specified in PANS-AIM.

5.4.3.2 Recommendation. — The Aeronautical (AIP) data set should be provided.

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

5.4.4 Terrain and obstacle data sets

The coverage areas for sets of electronic terrain and obstacle data shall be as specified in Appendix 1.

5.4.4.1 Terrain data sets

5.4.4.1.1 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.

5.4.4.1.2 Terrain data shall be provided for Area 1.

5.4.4.1.3 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.

5.4.4.1.4 Recommendation.— For aerodromes regularly used by international civil aviation, electronic terrain data should be provided for Areas 2b, 2c and 2d for terrain that penetrates the relevant terrain data collection surface specified in Appendix 1.

5.4.4.1.5 Recommendation.— Arrangements should be made for the coordination of providing terrain data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same terrain are correct.

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

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

5.4.4.1.8 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.

5.4.4.1.9 Recommendation.— Where additional terrain data are collected to meet other aeronautical requirements, the terrain data sets should be expanded to include these additional data.

5.4.4.2 Obstacle data sets

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

5.4.4.2.2 Obstacles shall not be included in terrain data sets.

5.4.4.2.3 The obstacle data shall be provided for obstacles in Area 1 higher than 100 m above surface.

5.4.4.2.4 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.

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

a) Area 2a, for those obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 1;

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.

5.4.4.2.6 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 in Appendix 1, 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.

5.4.4.2.7 Recommendation.— Arrangements should be made for the coordination of providing obstacle data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same obstacle are correct.

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

5.4.4.2.9 Recommendation.— At 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 specified in Appendix 1.

5.4.4.2.10 For aerodromes regularly used by international civil aviation, obstacle data shall be provided for Area 4 for obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 1, for all runways where precision approach Category II or III operations have been established.
5.4.4.2.11 **Recommendation.**— Where additional obstacle data are collected to meet other aeronautical requirements, the obstacle data sets should be expanded to include these additional data.

5.4.5 Aerodrome mapping data sets

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

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

5.4.5.2 **Recommendation.**— Aerodrome mapping data sets should be provided for aerodromes regularly used by international civil aviation.

5.4.6 Instrument flight procedure data sets

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

*Note.*— The exact content of the instrument flight procedure data sets is specified in PANS-AIM.

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

5.5 Distribution services

5.5.1 Aeronautical Information Products shall be distributed to those users who requested them.

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

5.5.3 **Recommendation.**— Global communication networks and Web services shall, whenever practicable, be employed for the provision of Aeronautical Information Products.

5.5.4 NOTAM distribution

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

5.5.4.2 The AFS shall, whenever practicable, be employed for NOTAM distribution.

5.5.4.3 The originating State shall select the NOTAM that are to be given regular international distribution.

5.5.4.4 International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices and multinational NOTAM Processing Units concerned.

5.5.4.5 The Originating State shall upon request grant distribution of NOTAM series other than those distributed internationally.

5.5.4.6 **Recommendation.**— Selective distribution list should be used when practicable.

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

5.6 Pre-Flight Information Service

5.6.1 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.

5.6.2 Aeronautical information provided for pre-flight planning purposes shall include information of operational significance from the elements of the Aeronautical Information Products.

*Note 1.*— The elements of the Aeronautical Information Products may be limited to national publications and when practicable, those of immediately 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 can be made available to flight crews in the form of plain-language pre-flight information bulletins (PIB). Guidance on the preparation of PIB is contained in the Aeronautical Information Services Manual (Doc 8126).

5.7 Post-flight information Service

5.7.1 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 aircrews.

5.7.2 The arrangements specified in 5.7.1 shall ensure that such information is made available to the aeronautical information service for distribution as the circumstances necessitate.

5.7.3 The information about presence of birds 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 Aeronautical data and aeronautical information shall be amended or reissued to 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 [4 January 2010]:

a) Limits (horizontal and vertical), regulations and procedures applicable to:
   1) flight information regions;
   2) control areas;
   3) control zones;
   4) advisory areas;
   5) ATS routes;
   6) permanent danger, prohibited and restricted areas (including type and periods of activity when known) and 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.

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 distributed/made available by the AIS so as to reach recipients at least 28 days in advance of the AIRAC 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 also 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.

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 possible, information should be distributed/made available by the AIS so as to reach recipients at least 56 days in advance of the AIRAC 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 IFR operations.

   b) New runways for IFR operations at international aerodromes.

   c) Design and structure of the air traffic services 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 on what constitutes a major change is included in Doc 8126.

6.3 Aeronautical Information Product updates

6.3.1 AIP updates

6.3.1.1 AIP shall be amended or reissued at such regular intervals as may be necessary to keep them 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.

6.3.1.4 When an error occurs in an AIP Supplement or when the period of validity of an AIP Supplement is changed, a new AIP Supplement shall be published as a replacement.

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 provided giving a brief description of the contents.

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 provided concerning the following information:

   a) establishment, closure or significant changes in operation of aerodrome(s) or heliport(s) or runways;

   b) establishment, withdrawal and significant changes in operation of aeronautical services (AGA, AIS, ATS, CNS, MET, SAR, etc.);

   c) establishment, withdrawal and 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;
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 made to visual aids;
f) interruption of or return to operation of major components of aerodrome lighting systems;
g) establishment, withdrawal or significant changes made 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, 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) significant changes in the level of protection normally available at an aerodrome/heliport for rescue and fire fighting purposes. NOTAM shall be issued only when a change of category is involved and such change of category shall be clearly stated (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) forecasts of solar cosmic radiation, where provided;
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 air traffic services and related supporting services.

Comment [33]: From Stephane: This long list of examples was questioned -- do we really need all this?
Comment [34]: From Stephane: Why is there a shall here in the middle of the list? This paragraph should be reconsidered.
Comment [35]: Agreed - after the word purposes replace full stop with comma and remove "NOTAM shall be issued only" ...
Comment [36]: Change issued to provided.
Comment [37]: Need to confirm this? - I thought 'issued' is for NOTAM 'whereas 'provided' is for all other information.
6.3.2.4 Recommendation. — The need for providing a NOTAM should be considered in any other circumstance which may affect the operations of aircraft.

6.3.2.5 The following information shall not be notified by NOTAM:

- Routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- Runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- Temporary obstructions in the vicinity of aerodromes/heliports that do not affect the safe operation of aircraft;
- Partial failure of aerodrome/heliport lighting facilities where such failure does not directly affect aircraft operations;
- Partial temporary failure of air-ground communications when suitable alternative frequencies are available and are operative;
- The lack of apron marshalling services and road traffic closures, limitations and control;
- The unserviceability of location, destination or other instruction signs on the aerodrome movement area;
- Parachuting when in uncontrolled airspace under VFR (see 5.1.1.1 l)), when controlled, at promulgated sites or within danger or prohibited areas;
- Training activities by ground units;
- Unavailability of back-up and secondary systems if these do not have an operational impact;
- Limitations to airport facilities or general services with no operational Impact;
- National regulations not affecting general aviation;
- Announcement or warnings about possible/potential limitations, without any operational impact;
- General reminders on already published information;
- Availability of equipment for ground units without containing information on the operational impact for airspace and facility users;
- Information about laser emissions without any operational impact and fireworks below minimum flying heights;
- Closure of movement area parts in connection with planned work locally coordinated of duration of less than one hour;
- Closure, changes, unavailability in operation of aerodrome(s)/heliport(s) other than aerodrome(s)/heliport(s) operation hours.
- 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 crew members.

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 and/or a sub-set that includes only the differences from the previously
6.3.3.3 Recommendation. - When made available as a completely re-issued 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, Aeronautical (AIP) data sets and Instrument Flight Procedures data sets shall be synchronised.
Appendix 1 - Terrain and Obstacle data requirements

The coverage areas for sets of terrain and obstacle data 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.
  — 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 the 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;
— 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.
— 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.

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.

Terrain data collected with Area 1 numerical requirements
Terrain data collected with Area 2 numerical requirements

Figure A1-1. Terrain data collection surfaces — Area 1 and Area 2

2. Within the area covered by a 10-km radius from the ARP, terrain data shall comply with the Area 2 numerical requirements.
3. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 2 numerical requirements.

4. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that does not penetrate the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 1 numerical requirements.

5. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data shall comply with the Area 1 numerical requirements.

Note.— Terrain data numerical requirements for Areas 1 and 2 are specified in PANS-AIM, Table A1-6.
Figure A1-2. Obstacle data collection surfaces — Area 1 and Area 2

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

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

b) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15% to each side. The Area 2b obstacle collection surface has a 1.2% slope extending from the ends of Area 2a at
the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15% to each side. Obstacles less than 3 m in height above ground need not be collected;

c) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c shall be the elevation of the point of Area 2a at which it commences. Obstacles less than 15 m in height above ground need not be collected; and

d) Area 2d: an area outside the 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.

7. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data shall be collected and recorded in accordance with the Area 1 requirements.

8. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher shall be collected and recorded in the database in accordance with the Area 1 numerical requirements specified in PANS-AIM, Table A1-8.
9. The data collection surface for terrain and obstacles extends a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.
10. Terrain and obstacle data in Area 3 shall comply with the numerical requirements specified in *PANS-AIM, Table A1-6* and *PANS-AIM, Table A1-8*, respectively.

![Figure A8-4](image.png)

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

11. Terrain and obstacle data in Area 4 shall comply with the numerical requirements specified in *PANS-AIM, Table A1-6* and *PANS-AIM, Table A1-8*, respectively.