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Puntarenas, Costa Rica, 1 to 4 June 2015

Agenda Item 4: Follow-up on the NAM/CAR Regional Performance Based Air Navigation Implementation Plan (NAM/CAR RPBANIP)

4.1 Progress reports of the Task Forces and the ANI/WG

PROCEDURES FOR AIR NAVIGATION FOR AERONAUTICAL INFORMATION MANAGEMENT (PANS-AIM)

(Presented by the Secretariat)

EXECUTIVE SUMMARY

The AIM specialists at headquarters through the Study Group for the transition from AIS to AIM prepared the PANS-AIM. This information paper could be used as a reference to States of the NAM/CAR Regions as an introductory way to support implementation of the QMS processes in the AIM.

<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency• Environmental Protection
<i>References:</i>	<ul style="list-style-type: none">• Annex 15 - <i>Aeronautical Information Services</i>• Doc 8126 - <i>Aeronautical Information Services Manual</i>• PANS-AIM (draft version - English only)

1. Introduction

1.1 The Air Navigation Commission, at the eleventh meeting of its 177th. Session on 20 March 2008, agreed to the establishment of a study group in order to assist the Secretariat with the development of:

- a global strategy/roadmap for the transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM);
- Standards and Recommended Practices (SARPs) and guidance material related to the provision of a standard aeronautical information conceptual model and standard aeronautical information exchange model to enable the global exchange of information and data in digital format; and
- other SARPs, guidance material and training material necessary to support AIM implementation.

1.2 Previously there were only two ICAO documents where AIS and AIM can be addressed in terms of standards, practices, and procedures; Annex 15 and the Aeronautical Information Services Manual, Doc 8126.

1.3 While many of the specifications in Doc 8126 were too detailed to be incorporated into Annex 15, it has been observed that the promulgation in a guidance document may not be conducive to reaching a higher level of harmonization.

1.4 The ICAO AIS-AIM Study Group Secretariat undertake to amend the terms of reference of the AIS-AIMSG to include the development of PANS-AIM, to revise the frequency of meetings, and to extend the mandate to a date that will accommodate the work of the group.

2. Development

2.1 The ICAO AIS-AIM Study Group, following an assessment of the two ICAO documents, proposed that specifications published as Procedures for Air Navigation Services (PANS) would provide a mean for increased harmonization within the domain of AIS/AIM, as well as provide a vehicle for the emerging technical requirements of AIM.

2.2 Since PANS primarily consist of material related to the standardization of how something is to be done, material such as product specifications, standard procedures, and protocols are ideal material for promulgation as PANS.

With the foregoing in mind it was considered that the PANS-AIM would be assembled from:

- Appendix 1 of Annex 15 concerning the formatting of an AIP;
- Appendices 2, 3, 5, and 6 of Annex 15 and material from Doc 8126 concerning NOTAM, SNOWTAM, and ASHTAM;
- Material from Doc 8126 concerning AIC and AIRAC where it is desirable to elevate the material to a status beyond guidance; and
- Any new material deemed necessary.

2.3 The guidance material contained in the **attached** PANS-AIM (available only in English) has been developed to provide assistance to States in the planning and implementation in order to fulfil the requirement in Annex 15. This new PANS contains key elements to provide States with an understanding of the requirements for a AIM procedures and the elements in support of a Transition to AIM, which constitutes the basis for the provision of aeronautical information in a manner that will complement SARPs contained in Annex 15.

3. Conclusions

3.1 States should take note of the Appendix (PANS-AIM Draft version –English only) to this Information Paper in support of the processes of implementation of the AIM.

PANS-AIM

- DRAFT - 20 May 2015 -

Foreword

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ICAO AIS-AIM Study Group

Following an assessment of the two ICAO documents, it was proposed by the study group that specifications published as Procedures for Air Navigation Services (PANS) would provide a means for increased harmonisation within the domain of AIS/AIM as well as provide a vehicle for the emerging technical requirements of AIM.

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CHAPTER 1 - GENERAL

1.1 Historical background

1.1 The *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) are the result of the transition from the product based Aeronautical Information Services (AIS) to the data centric Aeronautical Information Management (AIM).

1.2 The first requirements in the field of Aeronautical Information 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, PICA0 Doc 2713) in January 1947.

1.3 In 1949, the Special NOTAM Meeting reviewed and proposed amendments to these procedures which were later issued as "Procedures for Air Navigation Services-Aeronautical Information Services (PANS-AIS) and which became applicable on 1 August 1951.

1.4 In 1952, the PANS-AIS were reviewed by the First Session of the Aeronautical Information Services Division which recommended their adoption as 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. [PANS-AIS got discontinued per xxx / superseded by Annex 15 ?]

1.5 Annex 15 has progressively evolved to serve the air navigation information needs. The events preceding the Eleventh Air Navigation Conference (AN-Conf/11) held in Montréal in September 2003 which endorsed the global air traffic management (ATM) operational concept re-defined the scope and functionality of AIS.

1.6 Aeronautical Information Service (AIS) was envisaged as one of the most valuable and important enabling services in (ATM) operational concept. The ATM concept, developed to be visionary in scope and not constrained by the level of technology available at the time, is based on a collaborative decision-making environment, the timely availability of high-quality and reliable electronic aeronautical, meteorological, airspace and flow management information would be necessary.

1.7 To satisfy new requirements arising from the Global ATM Operational Concept, aeronautical information services has to transition to a broader concept of aeronautical information management (AIM), with a different method of information provision and management given its data-centric nature as opposed to the product-centric nature of AIS.

1.8 With Aeronautical Information Management (AIM) the concept of a Data Catalogue is introduced which details data elements in terms of field names, field types and field definitions. Further, this approach allows the data collection activity to be decoupled from the definition of the end-products. The end-user applications, which make use of the information transferred in the form of data sets, do not rely exclusively on the structure and format of the messages but are free to manage the data and combine it with other data to construct the final view appropriate for the end-user.

1.9 This edition titled *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) contains detailed requirements for the collection, specification and provision of aeronautical data and aeronautical information.

1.2 Scope and purpose

2.1 *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) are complementary to the Standards and Recommended Practices contained in Annex 15 —

Aeronautical Information Services and in Annex 4-*Aeronautical Charts*. They are supplemented when necessary by regional procedures contained in the *Regional Supplementary Procedures* (Doc 7030).

Note 1.— Although the provisions and procedures are mainly directed to States (including AIS), data originators, commercial data houses of aeronautical data & aeronautical information and users should be familiar with the procedures contained in this document:

Note 2. — One of the objectives of AIM is to ensure integrity of aeronautical data is maintained through the data process from survey/origination to distribution to the next intended user. The provisions and procedures in this document do not relieve the end users of aeronautical data and aeronautical information of their responsibility to ensure accuracy and integrity of aeronautical data and information received.

1.3 Status

3.1 The Procedures for Air Navigation Services (PANS) do not have the same status as the Standards and Recommended Practices. While the latter are *adopted* by Council in pursuance of Article 37 of the Convention on International Civil Aviation, subject to the full procedure of Article 90, the PANS are *approved* by the Council and recommended to Contracting States for worldwide application

3.2 While the PANS may contain material which may eventually become Standards or Recommended Practices (SARPs) when it has reached the maturity and stability necessary for adoption as such, they may also comprise material prepared as an amplification of the basic principles in the corresponding SARPs, and designed particularly to assist the user in the application of those SARPs. (PANS-ATM)

1.4 Implementation

The implementation of procedures is the responsibility of Contracting States; they are applied in actual operations only after, and in so far as, States have enforced them. However, with a view to facilitating their processing towards implementation by States, they have been prepared in language which will permit direct use by the ATM community. (PANS-ATM)

1.5 Publication of differences

5.1 The PANS do not carry the status afforded to Standards adopted by the Council as Annexes to the Convention and, therefore, do not come within the obligation imposed by Article 38 of the Convention to notify differences in the event of non-implementation. (PANS-ATM-Status)

5.2 However, attention of States is drawn to the provision of Annex 15 related to the publication in their Aeronautical Information Publication of lists of significant differences between their procedures and the related ICAO procedures. (PANS-ATM)

1.6 Promulgation of information

Information relating to the establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations provided according to the Procedures specified in this document should be notified and take effect in accordance with Annex 15. (PANS-ATM)

1.7 Contents of the document

Table A. Amendments to the PANS-AIM

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1.8 Definitions

When the following terms are used in the present document 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*¹).

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,

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

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*).

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.

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 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 data 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 data 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). Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data are 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 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.

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.

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.

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.

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.

CHAPTER 2. AERONAUTICAL INFORMATION MANAGEMENT

2.1 Information management requirements

Management of aeronautical data and aeronautical information shall be carried out to include the following handling processes:

- collection
- processing
- quality control

2.1.1 Collection

2.1.1.1 The identification of the data originator (or of the relevant intermediate entity responsible for delivering data to AIS) shall be documented taking into account the scope of aeronautical data and aeronautical information to be collected.

2.1.1.2 A record of data originators should be maintained.

Note. — *Metadata requirements in Chapter 4 specify which information is to be recorded for each originator*

2.1.1.3 Each data element to be collected should be mapped to an identified data originator, in accordance with the formal arrangements established between data originators and AIS.

2.1.1.4 The Data Catalogue should be used for establishing the formal arrangements between originators and aeronautical information services.

2.1.1.5 The valid codes for the properties or sub-properties of type code list should be defined in the formal arrangements between originator of the data and the aeronautical information service.

2.1.1.6 The Data Catalogue shall be considered as a reference for aeronautical data origination and publication requirements.

Note 1. - *the Data Catalogue presents the scope of data that can be collected and maintained by the Aeronautical Information Service*

Note 2. - *the Data Catalogue provides a common language that can be used by data originators and AIS;*

Note 3. - *The description of the Data Catalogue is provided in Appendix 1.*

2.1.2 Processing

2.1.2.1 Collected data shall be verified and validated for compliance with completeness, format, timeliness, traceability and data quality requirements.

Note 1. — *Appendix 1 contains aeronautical data attributes, metadata, and accuracy requirements.*

Note 2. — *Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity), traceability and protection requirements may be found in the World Geodetic System — 1984 (WGS-84) Manual (Doc 9674).*

Note 3. — *Supporting data quality material in respect of data accuracy, publication resolution, and integrity of aeronautical data, together with guidance material in respect to the rounding convention for aeronautical data, is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77 — Standards for Aeronautical Information (or equivalent).*

Note 4. — *Guidance material on the management of aeronautical data quality is included in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839).*

Note 5. — *Verification activities may include:*

- a) *Comparison processes in which data and information are compared with an independent source;*
- b) *Feedback processes in which data and information are compared between their input and output state;*
- c) *Processing through multiple independent and different systems, comparing the*

output of each; this includes performing alternative calculations.

- d) *Processes in which data and information are compared to the originator's request;*

Note 6. — Validation activities may include:

- a) *Application processes in which data and information are tested;*
- b) *Processes in which data and information are compared between two different outputs, and;*
- c) *Processes in which data and information are compared to an expected range, value or other business rules.*

2.1.2.2 Automation systems implemented for processing aeronautical data and aeronautical information should ensure traceability of the performed actions.

2.1.3. Quality control

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

2.1.3.1 Quality checks should be implemented to ensure compliance with product specifications contained in Chapter 5 of PANS-AIM.

2.1.3.2 When the same data is duplicated in different AI products, coherency checks should be undertaken.

2.2 Data protection

2.2.1—Technical controls used to protect data integrity should be based on the use of systematic cycling codes (e.g. cyclic redundancy check - CRC) or cryptographic technologies (e.g. hash functions, message authentication codes, symmetric and asymmetric encryption, and digital certificates).

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

CHAPTER 3. QUALITY AND SAFETY MANAGEMENT

3.1 Quality management system

In the framework of the quality management system, a user feedback system shall be defined and implemented.

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

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

Note 3. — International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme. An ISO 9000 certificate issued by an accredited certification body is considered an acceptable means of compliance.

Note 4. — Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (Doc 9919).

3.2 Safety management

3.2.1 Monitoring and measurement processes and procedures should be established in order to provide verification that safety performance complies with the established safety policy and objectives.

3.2.2 Safety management activities

3.2.2.1 Assessment and mitigation of hazards and safety risks relating to AIM changes should include:

- a) identifying potential and actual hazards as well as associated safety risks related to AIM processes, procedures, resources and systems changes;
- b) assessing and classifying the safety risks for acceptability;
- c) identifying and implementing mitigations to reduce safety risks to an acceptable level; and
- d) evaluating the mitigation measures to determine effectiveness in reducing the associated safety risk.

3.2.2.2 Voluntary confidential reporting procedures should be implemented where appropriate.

Note 1.— A non-punitive environment is fundamental to voluntary reporting.

Note 2.— Each State is encouraged to facilitate and promote the voluntary reporting of events that could affect aviation safety by adjusting their applicable laws, regulations and policies.

3.2.2.3 As a minimum, the following safety documents should be developed and maintained:

- a) The safety policy and objectives of the organization;
- b) Responsibilities, authorities and accountabilities for safety related activities; and
- c) Records of identified safety risks, safety assessments performed and mitigations implemented.

3.3 Relationship between safety management and quality management

Note 1.— The objective of quality management is to satisfy the needs of the users of a product or a service, whether they are expressed or implied. Safety is one of the requirement relating to aeronautical information management and aeronautical information services and products.

Note 2.— Hence, safety management is that part of quality management that deals with the satisfaction of the users' requirement for safety.

Note 3.— Safety management activities can be embedded into a safety management system or exist as standalone activities. A safety management system can exist on its own or be part of a broader quality management system which will then deal with all the aspects of quality, including safety.

Chapter 4 - Scope of Aeronautical Data and Aeronautical Information

4.1 Data Catalogue

4.1.1 Data shall be collected and transmitted to AIS in accordance with the accuracy requirements and integrity classification.

4.1.2 Three types of positional data shall be identified: surveyed points (e.g. navigation aids positions, runway threshold), calculated points (mathematical calculations from the known surveyed points of points in space, fixes) and declared points (e.g. flight information region boundary points).

4.1.3 Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information services authority in terms of the World Geodetic System — 1984 (WGS-84) geodetic reference datum, identifying those geographical coordinates which have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the applicable requirements contained in the Data Catalogue.

4.1.4 The data elements to be originated for a property or sub-property should be those specified in column 3 of Table A1-9 of Appendix 1

4.3 Metadata Requirements

4.3.1 The metadata to be collected shall include, as a minimum:

- 1) the name of the organizations or entities performing any action of originating, transmitting or manipulating the data;
- 2) the action performed; and
- 3) the date and time the action was performed.

Note 1. — ISO standard 19115 specifies requirements for Geographic information — metadata

CHAPTER 5 - AERONAUTICAL INFORMATION PRODUCTS AND SERVICES

5.1 General

5.1.1 Aeronautical data shall be published in accordance with the resolution requirements contained in the Data Catalogue.

5.1.2 Aeronautical data shall be provided in accordance with the integrity classification contained in the Data Catalogue.

5.1.3 The identification of geographical coordinates whose accuracy does not meet the requirements may be made either with an annotation or by explicitly providing the actual accuracy value.

5.1.3.1 In aeronautical information products that are distributed on paper, the identification should be done with an asterisk following the coordinate value concerned.

5.2 Aeronautical information in a standardized presentation

5.2.1 Aeronautical Information Publication (AIP)

5.2.1.1 Contents

5.2.1.1.1 The AIP shall contain concise, current information relating to, and arranged under, the subject headings listed in, Appendix 3. This facilitates both the locating of information under a specific heading and the storage/retrieval of the information using automated processing.

5.2.1.1.2 If no facilities or services are provided or no information is available for publication in respect of one of the categories of information specified in, Appendix X, an indication should be given as to which of these circumstances applies (e.g. "NIL" or "Not AVBL").

5.2.1.1.3 When the AIP Data Set (as specified in 5.3.2.1) is provided, the following sections of the AIP may be left empty:

- 1) *ENR 2.1 FIR, UIR, TMA*
- 2) *ENR 3.1 Lower ATS Routes*
- 3) *ENR 3.2 Upper ATS Routes*
- 4) *ENR 3.3 Area Navigation (RNAV) Routes*
- 5) *ENR 3.4 Helicopter Routes*
- 6) *ENR 3.5 Other Routes*
- 7) *ENR 3.6 En-route Holding*
- 8) *ENR 4.1 Radio navigation aids — en-route*
- 9) *ENR 4.4 Name-code designators for significant points*
- 10) *ENR 4.5 Aeronautical Ground Lights — En-route*
- 11) *ENR 5.1 Prohibited, Restricted and Danger Areas*
- 12) *ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ)*
- 13) *ENR 5.3.1 Other activities of a dangerous nature*
- 14) *ENR 5.5 Aerial sporting and recreational activities*
- 15) ****AD 2.19 Radio navigation and landing aids*

5.2.1.1.4 When the Obstacle Data Set (as specified in 5.3.2.3.2) is provided, the following sections of the AIP may be left empty and an unambiguous reference to the data set availability shall be provided

- 16) *ENR 5.4 Air navigation obstacles*
- 17) ****AD 2.10 Aerodrome obstacles*
- 18) ****AD 3.10 Heliport obstacles*

5.2.1.1.5 When an AIP Section is left empty due to the availability of the information in a data set, the following note shall be put in that section: "*The data is available in the AIP Data Set, which may be obtained as specified in GEN 3.1.6*" or "*The data is available in the Obstacle Data Set, which may be obtained as specified in GEN 3.1.6*", as appropriate.

5.2.1.2 General Specification

5.2.1.2.1 The issuing State and publishing authority shall be clearly indicated.

5.2.1.2.2 When two or more States issue an AIP jointly, both issuing States shall be clearly indicated in the table of contents.

5.2.1.2.3 Each AIP shall be self-contained and shall include a table of contents.

5.2.1.2.4 Each AIP shall be dated.

5.2.1.2.4.1 The date, consisting of the day, month (by name) and year, shall be the publication date or the effective date (AIRAC) of the information.

5.2.1.2.5 Charts, maps or diagrams shall be used, when appropriate, to complement or as a substitute for the tabulations or text of Aeronautical Information Publications.

Note.— Where appropriate, charts produced in conformity with Annex 4 — Aeronautical Charts, may be used to fulfil this requirement. Guidance material as to the specifications of index maps and diagrams included in Aeronautical Information Publications is contained in the Aeronautical Information Services Manual (Doc 8126).

5.2.1.2.6 If an AIP is issued in more than one language, a bilingual or multilingual edition may assist in the interpretation of questionable text.

5.2.1.2.7 When listing locations, the city or town should be given in capital letters followed, where the facility is an aerodrome/heliport or is located at an aerodrome/heliport, by an oblique stroke and the name of the aerodrome/heliport in smaller capital letters or lowercase type. Unless otherwise indicated, the list should be in alphabetical order.

5.2.1.2.8 The spelling of place names shall conform with local usage, transliterated where necessary into the ISO Basic-Latin alphabet.

5.2.1.2.9 In the indication of the geographical coordinates of a location:

— the latitude should be given first;

— symbols for degrees, minutes or seconds should be omitted;

— two digits should always be used in expressing values of less than 10 degrees of latitude; and

— three digits should always be used in expressing values of less than 100 degrees of longitude.

5.2.1.2.10 Hours of operation of various facilities and services should be given in terms of coordinated universal time (UTC) or by use of one of the following abbreviations:

HJ — Sunrise to sunset

HN — Sunset to sunrise

HO — Service available to meet operational requirements

HS — Service available during hours of scheduled operations

HX — No specific working hours

H24 — Continuous day and night service

5.2.1.2.11 When describing periods of activity, availability or operation, specify the applicable days and times.

5.2.1.2.12 The units of measurement selected for use in the AIP, e.g. dimensions on aerodromes, distances, elevations or altitudes, should be consistently followed and should adhere to Annex 5.

5.2.1.2.13 An AIP shall be organised in three parts (GEN, ENR and AD), sections and sub-sections, except when the AIP, or a volume of the AIP, is designed to facilitate operational use in flight, the precise format and arrangement may be left to the discretion of the State provided that an adequate table of contents is included.

5.2.1.2.14 Index maps and diagrams included in the AIP should comply with the following specifications:

a) *Base map:* The base map should be an outline map of the area adapted from existing material with general details. Graticules, topography and other details should be as simple as possible. Political subdivisions should be shown and identified. It should be produced in one colour.

b) *Sheet size and scale:* The overall dimensions should be 210 mm × 297 mm. If a larger map is required, it should be folded to conform to this size. A uniform scale should be used for all charts produced as a series and other charts where practicable.

c) *Title and marginal notes:* The title should be shown on the top border and should be as short and simple as possible.

d) *Colours*: The number of colours used should be kept to a minimum. If more than one colour is used, the colours should offer adequate contrast.

e) *Symbols*: Symbols should conform, where practicable, to the ICAO Chart symbols shown in Annex 4, Appendix 2. The basic, general purpose symbols for AIP index maps are a filled circle ● and an empty circle ○. Except when the symbols used are self explanatory, a legend should be provided. For details for which no ICAO symbol has been provided, any appropriate symbol may be chosen provided it does not conflict with an ICAO symbol.

5.2.1.3 Specifications for AIP Amendments

5.2.1.3.1 The AIP shall be amended or re-issued at such regular intervals as necessary to ensure the information contained in the AIP is complete and up to date. In this respect, it shall be noted that any operationally significant changes to the information shall be issued in a predetermined schedule (as described in Chapter 6) and clearly identified as such.

5.2.1.3.2 When a State has established the regular interval or publication dates for its AIP Amendments, these intervals or publication dates shall be issued ~~published~~ in the AIP, Part 1 — General (GEN).

5.2.1.3.3 New or revised information contained in an AIP replacement pages shall be identified.

5.2.1.3.4 Each AIP Amendment shall be allocated a serial number, which shall be consecutive.

5.2.1.3.5 Each AIP Amendment shall contain a publication date.

5.2.1.3.6 Each AIP Amendment shall show a publication date and an effective date when applicable.

5.2.1.3.7 Each AIRAC AIP Amendment page shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be indicated.

5.2.1.3.8 Each predetermined schedule AIP Amendment shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be indicated.

5.2.1.3.9 When an AIP Amendment is issued, it shall include references to the serial number of those elements, if any, of the NOTAM which have been incorporated into the amendment.

5.2.1.3.10 A brief indication of the subjects affected by the amendment shall be given on the AIP Amendment cover sheet.

5.2.1.3.11 Each amendment shall include a checklist giving the current date of each loose-leaf page in the AIP, and shall provide a recapitulation of any outstanding manuscript corrections. The checklist shall carry both the page number and date.

5.2.1.4 Specifications for AIP Supplements

Note.— Since the AIP is subject to frequent change, provisions exist for its continual updating. In addition, changes of a temporary nature affecting the contents of an AIP are often required to cater for unexpected circumstances or, in some cases, planned modifications to a service/facility. The purpose of an AIP Supplement is to bring to the attention of users both temporary changes of long duration (three months or longer) and information of short duration containing extensive text or graphics which affect one or more parts of the AIP.

5.2.1.4.1 Each AIP Supplement shall be allocated a serial number which shall be consecutive and based on the calendar year (e.g. 2/13).

Note.— Guidance material on the use of AIP Supplements together with examples of such use is contained in the Aeronautical Information Services Manual (Doc 8126).

5.2.1.4.2 Whenever an AIP Supplement is issued as a replacement of a NOTAM, a reference to the series and number of the NOTAM shall be included.

5.2.1.4.3 A checklist of valid AIP Supplements shall be issued at intervals of not more than one month as part of the checklist of NOTAM required at 5.1.4.2 and with distribution as for the AIP Supplements.

5.2.2 Aeronautical Information Circulars

5.2.2.1 An AIC shall be provided whenever it is desirable to promulgate:

1) forecasts of important changes in the air navigation procedures, services and facilities provided;

- 2) forecasts of implementation of new navigational systems;
- 3) significant information arising from aircraft accident/incident investigation which has a bearing on flight safety;
- 4) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;
- 5) advice on medical matters of special interest to pilots;
- 6) warnings to pilots concerning the avoidance of physical hazards;
- 7) effect of certain weather phenomena on aircraft operations;
- 8) information on new hazards affecting aircraft handling techniques;
- 9) regulations relating to the carriage of restricted articles by air;
- 10) reference to the requirements of, and publication of changes in, national legislation;
- 11) aircrew licensing arrangements;
- 12) training of aviation personnel;
- 13) application of, or exemption from, requirements in national legislation;
- 14) advice on the use and maintenance of specific types of equipment;
- 15) actual or planned availability of new or revised editions of aeronautical charts;
- 16) carriage of communication equipment;
- 17) explanatory information relating to noise abatement;
- 18) selected airworthiness directives;
- 19) changes in NOTAM series or distribution, new editions of AIP or major changes in their contents, coverage or format;
- 20) advance information on the snow plan (see 7.1.1.2);
- 21) other information of a similar nature.

Note 1.— *The publication of an AIC does not remove the obligations set forth in Chapters 4 and 5.*

Note 2.— **An AIC shall not be used for information that qualifies for inclusion in AIP or NOTAM.**

5.2.2.2 The snow plan issued under AD 1.2.2 of the AIP shall be supplemented by seasonal information, to be issued well in advance of the beginning of each winter — not less than one month before the normal onset of winter conditions and shall contain information such as that listed below:

a) a list of aerodromes/heliports where snow clearance is expected to be performed during the coming winter:

*1) in accordance with the runway and taxiway systems; or

*2) planned snow clearing, deviating from the runway system (length, width and number of runways, affected taxiways and aprons or portions thereof);

*b) information concerning any centre designated to coordinate information on the current state of progress of clearance and on the current state of runways, taxiways and aprons;

c) a division of the aerodromes/heliports into SNOWTAM distribution lists in order to avoid excessive NOTAM distribution;

*d) an indication, as necessary, of minor changes to the standing snow plan;

*e) a descriptive list of clearance equipment;

*f) a listing of what will be considered as the minimum critical snow bank to be reported at each aerodrome/heliport at which reporting will commence.

5.2.2.3 The originating State shall select the AIC that are to be given international distribution.

5.2.2.4 States shall give AIC selected for international distribution the same distribution as for the AIP.

5.2.2.5 **Distribution of AIC on a national basis is left to the discretion of the originating State concerned.**

5.1.2.6 Each AIC shall be allocated a serial number which shall be consecutive and based on the calendar year.

5.2.2.7 **Since AIC information is often effective for long periods and requires little amendment, it will usually be found that AIC can, if necessary, remain outstanding for several years without inconvenience. A review and re-issue on a yearly basis is however advisable.**

5.2.2.8 **Further, if AIC are issued in more than one series, each series shall be identified by a letter (A 2/02, B 4/02, etc.).**

5.2.2.9 When AIC are distributed in more than one series, each series shall be separately identified by a letter.

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

5.2.3 Printed products

5.2.3.1 Printed AIP

5.2.3.1.1 When the AIP is issued as a printed volume, it should be published in looseleaf form unless the complete publication is reissued at frequent intervals.

5.2.3.1.2 Each AIP issued as a printed volume and each page of an AIP issued in loose-leaf form shall be so annotated as to indicate clearly:

a) the issuing State or the joint issuing States shall be clearly indicated on the cover and in the table of contents;

b) the territory covered and subdivisions when necessary;

c) the identification of the issuing State and producing organization (authority);

d) page numbers/chart titles;

e) the degree of reliability if the information is doubtful.

5.2.3.1.3 The normal method of amendment of the printed volume AIP shall be by means of replacement sheets.

5.2.3.1.4 New or revised information shall be identified by an annotation against it in the margin. A thick black vertical line or, where the change incorporated covers one line only or a part of a line, a thick black horizontal arrow, is sufficient to identify the change.

5.2.3.1.5 Each AIP amendment page, including the cover sheet, shall contain:

a) a publication date.

b) a publication date and an effective date when applicable.

5.2.3.1.6 Each AIRAC eAIP amendment, including the cover sheet, shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet

5.2.3.1.7 Each predetermined scheduled AIP amendment, including the cover sheet, shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet.

5.2.3.1.8 If it is necessary by reason of bulk or for convenience, to publish an AIP in two or more parts or volumes, each of them will indicate that the remainder of the information is to be found in the other part(s) or volume(s).

5.2.3.1.9 When the AIP is provided in more than one volume, each volume shall include:

— Preface

— Record of AIP Amendments

— Record of AIP Supplements

— Checklist of AIP pages

— List of current hand amendments

5.2.3.1.10 When the AIP is published as one volume, the above-mentioned subsections appear only in Part 1 — GEN and the annotation “not applicable” shall be entered against each of these subsections in Parts 2 and 3.

5.2.3.1.11 A system of page numbering adaptable to the addition or deletion of sheets should be adopted. The page number should include:

— an identification of the part of the AIP;

— the section; and

— subsection, as applicable;

thus creating a separate set of numbers for each subject (e.g. GEN 2.1-3, ENR 4.1-1 or AD 2.2-3).

5.2.3.1.12 A checklist giving the current date of each page in the AIP shall be reissued frequently to assist the user in maintaining a current publication.

5.2.3.1.13 The checklist shall carry both the page number and date.

5.2.3.1.14 The sheet size should be no larger than 210 × 297 mm, except that larger sheets may be used provided they are folded to the same size.

5.2.3.1.15 When a small number of charts are to be included and chart size is not larger than 210 mm × 297 mm or allows for folding to these dimensions, they should be contained in the AIP. If, on the other hand, there are many charts and they are frequently amended, it may be convenient to place them in a separate volume with a separate subscription service.

5.2.3.1.16 Maps and charts included in the AIP should be paginated in the same manner as other material.

5.2.3.1.17 AIP Supplement pages should be coloured in order to be conspicuous, preferably in yellow.

5.2.3.1.18 AIP Supplement pages should be kept as the first item in the AIP parts.

Note – As alternate to eliminate the need to continuously refer to the front of the AIP for the required information, the Supplements may be divided into specific parts (e.g. GEN, ENR, AD) for insertion in each AIP part, as necessary.

5.2.3.1.19 Each AIP Supplement page shall show a publication date. Each predetermined schedule AIP Supplement page shall show a publication date and an effective date.

5.2.3.1.20 AIP Supplement pages shall be kept in the AIP as long as all or some of their contents remain valid.

5.2.3.2 Printed AIC

5.2.3.2.1 Differentiation and identification of AIC topics according to subjects using colour coding should be practised where the numbers of AIC in force are sufficient to make identification in this form necessary.

5.2.3.2.2 It is recommended that AIC be colour coded by subject where there are sufficient circulars in force to warrant such identification, e.g.:

- a) white — administrative;
- b) yellow — ATC;
- c) pink — safety;
- d) mauve — danger area map; and
- e) green — maps/charts.

5.2.4 Electronic AIP (eAIP)

5.2.4.1 The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper.

Note 1.— This composite electronic document is named “Electronic AIP” (eAIP) and may be based on a format that allows for digital data exchange.

Note 2.— Guidance material for the production and provision of the eAIP is contained in Doc 8126.

5.2.4.2 When provided, the information content of the eAIP and the structure of chapters, sections and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.

5.2.4.3 When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet.

Note.— Guidance material on the use of the Internet is contained in Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).

5.2.5 NOTAM

5.2.5.1 General specifications

5.2.5.1.1 Except as otherwise provided in 5.2.5.1.5 and 5.2.5.1.6, each NOTAM shall contain the information in the order shown in the NOTAM Format in Appendix 4.

5.2.5.1.2 Text of NOTAM shall be composed of the significations/uniform abbreviated phraseology assigned to the ICAO NOTAM Code complemented by ICAO abbreviations, indicators, identifiers, designators, callsigns, frequencies, figures and plain language.

Note.— Detailed guidance material covering NOTAM, SNOWTAM, ASHTAM and PIB production is contained in Doc 8126.

5.2.5.1.3 All NOTAM shall be issued in English language.

Note.— The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO Abbreviations are those contained in the PANS-ABC (Doc 8400).

5.2.5.1.4 If necessary for domestic users, NOTAM may additionally be issued in national language.

5.2.5.1.5 Information concerning snow, slush, ice and standing water on aerodrome/heliport pavements, when reported by means of a SNOWTAM, shall contain the information in the order shown in the SNOWTAM Format in Appendix 5.

5.2.5.1.6 Information concerning an operationally significant change in volcanic activity, a volcanic eruption and/or volcanic ash cloud shall, when reported by means of an ASHTAM, contain the information in the order shown in the ASHTAM Format in Appendix 6.

5.2.5.1.7 When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued.

5.2.5.1.8 When a NOTAM is issued which cancels or replaces a previous NOTAM, the series and number of the previous NOTAM shall be indicated. The series, location indicator and subject of both NOTAM shall be the same. Only one NOTAM shall be cancelled or replaced by a NOTAM.

5.2.5.1.9 Each NOTAM shall deal with only one subject and one condition of the subject.

Note.— Guidance concerning the combination of a subject and a condition of the subject in accordance with the NOTAM Selection Criteria is contained in the Aeronautical Information Services Manual (Doc 8126).

5.2.5.1.10 Each NOTAM shall be as brief as possible and so compiled that its meaning is clear without the need to refer to another document.

5.2.5.1.11 Each NOTAM shall be transmitted as a single telecommunication message.

5.2.5.1.12 A NOTAM containing permanent or temporary information of long duration shall carry appropriate AIP or AIP Supplement references.

5.2.5.1.13 Location indicators included in the text of a NOTAM shall be those contained in Location Indicators (Doc 7910).

5.2.5.1.13.1 In no case shall a curtailed form of such indicators be used.

5.2.5.1.14 Where no ICAO location indicator is assigned to the location, its place name shall be entered in plain language, spelt in conformity with local usage, transliterated, when necessary, into the Latin alphabet.

5.2.5.2 NOTAM number and series allocation

5.2.5.2.1 The NOTAM Office shall allocate to each NOTAM a series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year. The four-digit number shall be consecutive and based on the calendar year.

5.2.5.2.2 Letters A to Z, with the exception of T, should be used to identify a NOTAM series.

5.2.5.2.3 All NOTAM shall be divided in series based on subject, traffic or location or a combination thereof, depending on end-user needs. NOTAM for aerodromes allowing international air traffic shall be issued in international NOTAM series.

5.2.5.2.4 If NOTAM is issued in both English and national language, the NOTAM series shall be organised so that the national language series are equivalents of the English language series in terms of content and numbering.

5.2.5.2.5 The content and geographical coverage of each NOTAM series shall be stated in detail in the AIP, GEN 3.

5.2.5.2.6 Series allocation shall be supervised and, if required, appropriate measures shall be taken to assure that no series reaches the maximum possible number of issued NOTAM before the end of a calendar year.

5.2.5.3 NOTAM Checklist

5.2.5.3.1 A checklist of valid NOTAM is issued as a NOTAM at intervals of not more than one month.

Note.— Omitting a NOTAM from the checklist does not serve to cancel a NOTAM.

5.2.5.3.2 One checklist NOTAM shall be issued for each series.

5.2.5.3.3 A checklist of NOTAM shall refer to the latest AIP Amendments, AIP Supplements, and at least the internationally distributed AIC, and, when it is selected, include the checklist of AIP Supplements.

5.2.5.3.4 A checklist of NOTAM shall have the same distribution as the actual message series to which they refer and shall be clearly identified as checklist.

5.3 Digital Data

5.3.1 General provisions

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

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

5.3.1.2 A description of the available digital data sets shall be provided in the form of data product specification on which basis air navigation users will be able to evaluate the products and determine whether they fulfil the requirements for their intended use (application).

Note.— ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information.

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

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

Note.— Guidance on the aeronautical information and data exchange models may be found in the Aeronautical Information Services Manual (Doc 8126).

5.3.1.4 The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.

5.3.1.5 The aeronautical information model used should:

- a) use the Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations and data types;
- b) include data value constraints and data verification rules;
- c) include provisions for metadata as specified in 5.3.2; and
- d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.

5.3.1.6 The aeronautical data exchange model used should:

- a) apply a commonly used data encoding format;
 - b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in 3.6.5;
- and
- c) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.

Note 1.—The intent of using a commonly used data encoding format is to ensure interoperability of aeronautical data exchange between agencies and organizations involved in the data processing chain.

Note 2.—Examples of commonly used data encoding formats include Extensible Markup Language (XML), Geography Markup Language (GML), and JavaScript Object Notation (JSON).

5.3.2 Metadata

5.3.2.1 Each data set shall include the following minimal set of metadata:

- a) the name of the organizations or entities providing the data set;

- c) the date and time when the data set was provided
- d) validity of the data set
- e) any limitations with regard to the use of the data set
- f) any non-compliance with the ICAO data quality requirements (as mentioned in section xx)

5.3.3 Data sets

Note.— A data subject may appear in multiple data sets.

5.3.3.1 Aeronautical (AIP) data set

Note. - The purpose of the AIP data set is to support the initial transition of the ATM domain towards the use of digital data sets instead of paper products. Therefore, its scope is defined considering the likelihood that the data contained in this set is actually being used in digital format by service providers, ATC and IFR/VFR airspace users.

5.3.3.1.1 The AIP Data sub-Set shall include data about the following Data Catalogue subjects, with the properties indicated in brackets being included as a minimum (if applicable):

- a) ATS Airspace (type, name, lateral limits, vertical limits, class of airspace)
- b) Special Activity Airspace (type, name, lateral limits, vertical limits, restriction, activation)
- c) Route (identifier prefix, flight rules, designator, ...)
- d) Route segment (navigation specification, startpoint, endpoint, track, distance, upper limit, lower limit, MEA, MOCA, direction of cruising level, reverse direction of cruising level, required navigation performance)
- e) Waypoint - enroute (reporting requirement, identification, location, formation)
- f) Aerodrome (location indicator, name, designator IATA, served city, certified ICAO, certification date, certification expiration date, control type, field elevation, reference temperature, magnetic variation, airport reference point)
- g) Runway (designator, nominal length, nominal width, surface type, strength)
- h) Runway Direction (designator, trueBearing, threshold, TORA, TODA, ASDA, LDA, rejected TODA)
- i) FATO (designation, length, width, threshold point,...)
- j) TLOF (designator, centre point, length, width, surface type)
- k) Radio navigation Aid (type, identification, name, aerodrome served, hours of operation, magnetic variation, frequency/channel, position, elevation, magnetic bearing, true bearing, zero bearing direction,

Note. - The description of the data subjects, their properties, data type and applicable data quality requirements is provided in the Data Catalogue contained in Appendix 1).

5.3.2.1.2 When a property is not defined for a particular occurrence of the subjects listed in 5.3.3.1.1, the AIP data sub-set shall include an explicit “not applicable” indication.

5.3.2.2 Terrain and obstacle data sets

Note.— Terrain and obstacle data are intended to be used in the following air navigation applications:

- a) ground proximity warning system with forward looking terrain avoidance function and minimum safe altitude warning (MSAW) system;
- b) determination of contingency procedures for use in the event of an emergency during a missed approach or take-off;
- c) aircraft operating limitations analysis;
- d) instrument procedure design (including circling procedure);
- e) determination of en-route “drift-down” procedure and en-route emergency landing location;
- f) advanced surface movement guidance and control system (A-SMGCS); and g) aeronautical chart production and on-board databases.

The data may also be used in other applications such as flight simulator and synthetic vision systems, and may assist in determining the height restriction or removal of obstacles that pose a

hazard to air navigation.

5.3.2.2.1 Terrain data set

5.3.2.2.1.1 A terrain grid shall be angular or linear and shall be of regular or irregular shape.

Note.— In regions of higher latitudes, latitude grid spacing may be adjusted to maintain a constant linear density of measurement points.

5.3.2.2.1.2 Sets of terrain data shall include spatial (position and elevation), thematic and temporal aspects for the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles. In practical terms, depending on the acquisition method used, this shall represent the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as “first reflective surface”.

5.3.2.2.1.3 In terrain data sets, only one feature type, i.e. terrain, shall be provided. Feature attributes describing terrain shall be those listed in [Appendix 8, Table A8-1](#). The terrain feature attributes listed in [Table A8-1](#) represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain data set.

5.3.2.2.1.4 Terrain data for each area shall conform to the applicable numerical requirements in the [Data Catalogue](#).

5.3.2.2.2 Obstacle data set

5.3.2.2.2.1 Obstacle data elements are features that shall be represented in the data sets by points, lines or polygons

5.3.2.2.2.2 In an obstacle data set, all defined obstacle feature types shall be provided and each of them shall be described according to the list of mandatory attributes provided in [Appendix 8, Table A8-2](#).

Note.— By definition, obstacles can be fixed (permanent or temporary) or mobile. Specific attributes associated with mobile (feature operations) and temporary types of obstacles are annotated in [Appendix 8, Table A8-4](#), as optional attributes. If these types of obstacles are to be provided in the data set, appropriate attributes describing such obstacles are also required.

5.3.2.2.2.3 Obstacle data for each area shall conform to the applicable numerical requirements in [Data Catalogue](#).

5.3.2.2.2.4 The obstacle data product specification, supported by geographical coordinates for each aerodrome included within the dataset, shall describe the following areas:

- Areas 2a, 2b, 2c, 2d;
- the take-off flight path area; and
- the obstacle limitation surfaces.

Note.— Area 4 terrain data and Area 2 obstacle data are normally sufficient to support the production of the Precision Approach Terrain Chart — ICAO. When more detailed obstacle data are required for Area 4, these may be provided in accordance with the Area 4 obstacle data requirements specified in Appendix 8, Table A8-2. Guidance on appropriate obstacles for this chart is given in the Aeronautical Chart Manual (Doc 8697).

5.3.2.3 Aerodrome mapping data sets

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

- a) position and route awareness including moving maps with own ship position, surface guidance and navigation (such as A-SMGCS);*
- b) traffic awareness including surveillance and runway incursion detection and alerting;*

- c) facilitation of aerodrome-related aeronautical information, including NOTAM;
- d) resource and aerodrome facility management; and
- e) aeronautical chart production.

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

Note 1.— Aerodrome mapping data are organized and arranged in aerodrome mapping databases (AMDBs) for ease of electronic storage and usage by appropriate applications.

Note 2.— The exact content of the aerodrome mapping data sets is defined in EUROCAE ED99 / RTCA DO 272.

Note 3.— Metadata elements applicable to aerodrome mapping data are contained in RTCA Document DO-291B and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-119B — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data.

5.3.2.3.1 Aerodrome mapping data — requirements for provision

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

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

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

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

5.3.2.3.2 Aerodrome mapping data product specification

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

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

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

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

5.3.2.3.3 Aerodrome mapping database — data set content and structure

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

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

5.3.2.4 Instrument flight procedure design data set

Note - The purpose of the Instrument flight procedure data set is to support the initial transition of the ATM domain towards the use of digital data sets instead of paper products. Therefore, its scope is defined considering the likelihood that the data contained in this set is actually being used in digital format by service providers, ATC and IFR/VFR airspace users.

5.3.2.4.1 The Instrument flight procedure design data set shall include data about the following Data Catalogue subjects, with the properties indicated in brackets being included as a minimum (if applicable):

- a) Waypoint - terminal (reporting requirement, identification, location, formation)
- b)

5.4 Distribution Services

5.4.1 Distribution to the next intended user will differ in the delivery method applied which may either be:

- c) Physical distribution. The means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package, such as postal services; or
- d) Direct electronic distribution. The means by which aeronautical data and aeronautical information distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.

5.4.2 Different delivery methods and data media may require different procedures to ensure the required data quality.

Note.— Further guidance on digital dataset distribution can be found in the Document - ICAO SWIM Concept - Doc 10039

5.4.3 NOTAM distribution

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

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

Note.— Arrangements may be made for direct exchange of SNOTAM (see Appendix 5) between aerodromes/heliports.

5.4.3.3 The international exchange of ASHTAM (see 5.1.4.1.5), and NOTAM where States continue to use NOTAM for distribution of information on volcanic activity, shall include volcanic ash advisory centres and the centres designated by regional air navigation agreement for the operation of AFS satellite distribution systems (satellite distribution system for information relating to air navigation (SADIS) and international satellite communications system (ISCS)), and shall take account of the requirements of long-range operations.

5.4.3.4 The exchange of NOTAM between international NOTAM offices and/or multinational NOTAM Processing Units shall, as far as practicable, cover the needs of operations personnel including flight crew members.

5.4.3.5 A predetermined distribution system for NOTAM transmitted on the AFS in accordance with Appendix X shall be used whenever possible, subject to the requirements of 5.3.3.

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

5.5 Pre-flight information services

5.5.1 Pre-flight information may be provided as a verbal briefing or a self-briefing.

5.5.2 Geographic coverage for pre-flight information services should be determined and periodically reviewed. In general the coverage zone should be limited to the FIR within which the aerodrome/heliport is located, the FIR(s) adjacent thereto, and all air route or portion of route flown without an intermediate landing, originating at the aerodrome/heliport and extending beyond the FIR(s) mentioned.

5.5.3 Automated pre-flight information systems shall be used to make aeronautical data and aeronautical information available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes. The aeronautical data and aeronautical information made available shall comply with the provisions of Annex 15.

5.5.4 Self-briefing facilities of an automated pre-flight information system shall provide access to operations personnel, including flight crew members and other aeronautical personnel concerned, for consultation as necessary with the aeronautical information service by telephone or other suitable telecommunications means. The human/machine interface of such facilities shall ensure easy access in a guided manner to all relevant information/data.

5.5.5 Automated pre-flight information systems for the supply of aeronautical data and aeronautical

information for self-briefing, flight planning and flight information service shall:

- a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical data stored;
- b) permit access to the system by operations personnel including flight crew members, aeronautical personnel concerned and other aeronautical users through suitable telecommunications means;
- c) ensure provision, in paper copy form, of the aeronautical data and aeronautical information accessed, as required;
- d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate, or based on a menu-driven user interface or other appropriate mechanism as agreed between the civil aviation authority and operator concerned; and
- e) provide for rapid response to a user request for information.

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

5.5.6 Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with Annex 15 and meteorological information in accordance with Annex 3 — Meteorological Service for International Air Navigation, should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 2.1.1 c) and the relevant meteorological authority.

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

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

5.5.8 A Trigger NOTAM shall be included in the pre-flight information bulletin for its entire validity period if less than fourteen days or for at least fourteen days if its validity is fourteen days or longer.

5.5.9 Although Miscellaneous NOTAM is regarded not subject for a briefing but available on request, all NOTAM shall be provided for briefing by default and that content reduction should be at user's discretion.

Chapter 6 - Aeronautical information updates

6.1 Aeronautical Information Regulation and Control (AIRAC)

6.1.1 Information provided under the AIRAC system and published in paper copy or made available on physical media ~~form~~ shall be distributed by the AIS ~~unit~~ at least 42 days in advance of the effective date.

6.1.2 When information has not been submitted by the AIRAC date, a NIL notification shall be distributed by NOTAM or other suitable means, not later than one cycle before the AIRAC effective date concerned.

6.2 Aeronautical Information Product updates

6.2.1 The same update cycle shall be applied to the AIP, the AIP data set and the Instrument Flight Procedures data set in order to ensure the coherence of the data items that appear in multiple aeronautical information products.

6.2.2 Specifications for AIP updates

6.2.1.1 The AIP Amendment regular interval shall be specified in the AIP, Part 1 — General (GEN).

Note.— Guidance material on the establishment of intervals between publication dates of AIP Amendments is contained in the Aeronautical Information Services Manual (Doc 8126).

6.2.1.2 When an AIP Amendment will not be published at the established regular interval or publication date, a NIL notification shall be originated and distributed by the NOTAM checklist.

6.2.1.3 Recourse to hand amendments or annotations shall be kept to the minimum.

6.2.1.4 When the AIP is provided in more than one volume, each volume should include separate amendment services.

6.2.3 Specifications for AIP Supplements

6.2.3.1 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.

Note 1.— The requirements for NOTAM apply when time constraints do not allow sufficient time for the distribution of an AIP Supplement.

Note 2.— Guidance material on the use of AIP Supplements together with examples of such use is contained in the Aeronautical Information Services Manual (Doc 8126).

6.2.4 Specifications for NOTAM

6.2.4.1 NOTAM should be published with sufficient lead time for the affected parties to take any required action, except in the case of unserviceability, volcanic activity, release of radioactive material, toxic chemicals and other events that cannot be foreseen.

6.2.4.2 NOTAM notifying unserviceability of aids to air navigation, facilities or communication services shall give an estimate of the period of unserviceability or the time at which restoration of service is expected.

6.2.4.3 At least seven days' advance notice should be given of the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions other than for emergency operations.

6.2.4.4 Notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace should be given as soon as possible.

Note.— Whenever possible, at least 24 hours' advance notice is desirable, to permit timely completion of the notification process and to facilitate airspace utilization planning.

6.2.4.5 Within three months from the issuing of a Permanent NOTAM, the information contained in

the NOTAM shall be included in the Aeronautical Information Products affected.

6.2.4.6 Within three months from the issuing of a temporary NOTAM of long duration, the information contained in the NOTAM shall be included in an AIP Supplement.

6.2.4.7 When a NOTAM with estimated end of validity unexpectedly exceeds the three-month period, a replacement NOTAM shall be issued, unless the condition is expected to last for a further period of more than three months; in this case an AIP Supplement shall be issued.

6.2.4.8-A “Trigger” NOTAM shall give a brief description of the content, the effective date and time, and the reference number of the amendment, datasets or supplement.

6.2.4.9 A “Trigger” NOTAM shall come into force on the same effective date and time as the AIP amendment or supplement.

6.2.4.10 In the case of an AIP Amendment, a “Trigger” NOTAM shall remain valid for a period of fourteen days.

6.2.3.11 In the case of an AIP Supplement that is valid for less than fourteen days, the “Trigger” NOTAM shall remain valid for the complete validity period of the AIP Supplement.

6.2.3.12 In the case of an AIP Supplement that is valid for fourteen days or more, the “Trigger” NOTAM shall remain valid for at least fourteen days.

Note.— Guidance material for the origination of NOTAM announcing the existence of AIRAC AIP Amendments or AIP Supplements (“Trigger NOTAM”) is contained in the Aeronautical Information Services Manual (Doc 8126).

6.2.5 Specifications for digital data updates

6.2.5.1 The update interval for the Aeronautical (AIP) data set and Instrument Flight Procedures data sets shall be specified in data product specification.

6.2.5.2 Data sets that have been made available in advance (according to the AIRAC cycle) shall be updated with the non-AIRAC changes that occurred in between the publication and the effective date.

APPENDIX 1. AERONAUTICAL DATA CATALOGUE

Note – The Data Catalogue is a reference of the aeronautical data subjects, properties and sub-properties organized in:

- Table A1-1 Aerodrome data;*
- Table A1-2 Airspace data;*
- Table A1-3 ATS routes data;*
- Table A1-4 Instrument flight procedure data;*
- Table A1-5 Radio navigation aids/systems data;*
- Table A1-6 Obstacle data;*
- Table A1-7 Geographic data; and*
- Table A1-8 Terrain data.*

Table A1-1 Aerodrome data

Subject (1)	Property (2)	Sub-Property (3)	Type (4)	Description (5)	Note (6)	Accuracy (7)	Integrity (8)	Orig Type (9)	Pub. Res. (10)	Chart Res. (11)
Runway				A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft. (Annex 14)						
	Designator		Text	The full textual designator of the runway, used to uniquely identify it at an aerodrome/airport which has more than one. E.g. 09/27, 02R/20L, RWY 1.						
	Nominal length		Distance	The declared longitudinal extent of the runway for operational (performance) calculations.		1m	critical	surveyed	1 m or 1 ft	1 m
	Nominal width		Distance	The declared transversal extent of the runway for operational (performance) calculations.		1m	essential	surveyed	1 m or 1 ft	1 m
	Geometry		Polygon	Geometries of RunwayElement, RunwayDisplacedArea and RunwayIntersection						
	Centre line points									
		Position	Point	The geographical location of runway centre line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway		1m	critical	surveyed		
		Elevation	Elevation	The elevation of the corresponding centre line point.		0.25m	critical	surveyed		
		Geoid undulation	Height	The geoid undulation at the corresponding centre line point						
	RWY exit line									
		Exit guidance line	Line	The geographical location of the runway exit line		0.5m	essential	surveyed	1/100 sec	1 sec
		Colour	Text	Colour of runway exit line						
		Style	Text	Style of runway exit line						
		Directionality	Code List	Directionality of RWY exit line (one-way or two-way)						
	Surface type		Text	The surface type of the runway defined as specified in Annex 14 Volume I						

- (1) Subject for which data can be collected
- (2) Property is an identifiable characteristic of a subject which can be further defined into sub-properties (3)
 - Note – The classification of a catalogue element as subject, property or sub-property does not impose a certain data model.*
- (4) The data is classified in different types. See Table A1-9 for more information on data types.
- (5) A description of the data element
- (6) Notes are additional information or conditions of the provision
- (7) Accuracy requirements for aeronautical data, based upon a 95 per cent confidence level.
 - Note – For those fixes and points that are serving a dual purpose, e.g. holding point and missed approach point, the higher accuracy applies*
 - Note – Accuracy requirements for obstacle and terrain data are based upon a 90 per cent confidence level.*
- (8) Integrity classification
- (9) Origination type: positional data is identified as surveyed, calculated or declared
- (10) Publication resolution
- (11) Chart resolution

Table A1-1 - Aerodrome data

	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Aerodrome / Heliport				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.							
	ICAO location indicator		Text	The four letter ICAO location indicator of the aerodrome/heliport, as listed in ICAO DOC 7910 (Location Indicators).		Annex 15 App 1 AD 1.3 1)/ AD 2.1					
	Name		Text	The primary official name of an aerodrome as designated by an appropriate authority.		Annex 15 App 1 AD 1.3 1)/ AD 2.1					
	Designator IATA		Text	The identifier that is assigned to a location in accordance with rules (resolution 767) governed by the International Air Transport Association (IATA).		AMDB					
	Served city		Text	The full name (free text) of the city or town the aerodrome/heliport is serving		Annex 15 App 1 AD 2.2 2)					
	Type of traffic permitted										
		International_national		Code list	Indication if international and/or national flights are permitted at the aerodrome/heliport		Annex 15 App 1 AD 1.3 2)				
		IFR_VFR		Code list	Indication if IFR and/or VFR flights are permitted at the aerodrome/heliport		Annex 15 App 1 AD 1.3 2)/ AD 2.2 7)				
		Sched_nonscheduled		Code list	Indication if scheduled and/or nonscheduled flights are permitted at the aerodrome/heliport		Annex 15 App 1 AD 1.3 2)				
		Civil_military		Code list	Indication if civil commercial aviation and/or general aviation and/or military flights are permitted at the aerodrome/heliport		Annex 15 App 1 AD 1.3 2)				
		Restricted_use		Text	Indication if an aerodrome or heliport not open for the public (Only for the use of the owners).		AIXM 5.1 AirportHeliport				
		Heliport type		Text	The type of the heliport as mention in Annex 14 Volume II (Surface-level, elevated, shipboard or helideck)		Annex 14 II 2.4.1 a)				

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Control type		Text	Indication if an aerodrome is under civil control, military control or joint control		Annex 4 App 2 Chart symbol					
	Certified ICAO	Text	Indication if airport is/is not certified according to the ICAO rules		Annex 15 App 1 AD 1.5					
Certification date		Date	The date when the airport certification has been issued by the supervising authority.		Annex 15 App 1 AD 1.5.2)					
	Certification expiration date	Date	The date when the airport certification will become invalid.		Annex 15 App 1 AD 1.5.2)					
Field elevation										
	Elevation	Elevation	The vertical distance above Mean Sea Level (MSL) of the highest point of the landing area.		Annex 15 App 1 AD 2.2.3) Annex 14 2.3.1	0.5 m	essential	surveyed	1m or 1 ft	1 m or 1 ft
Reference temperature	Geoid undulation	Height	Geoid undulation at the aerodrome/ heliport elevation position	where appropriate	Annex 15 App 1 AD 2.2.4) Annex 14 2.3.1	0.5 m	essential	surveyed	1 m or 1 ft	1 m or 1 ft
	Value	Value	The monthly mean of the daily maximum temperatures for the hottest month of the year at an aerodrome. This temperature should be averaged over a period of years. (ICAO recommendation)		Annex 15 App 1 AD 2.2.3) Annex 14 2.4.1					
Mean low temperature		Value	The mean lowest temperature of the coldest month of the year, for the last five years of data at the aerodrome elevation.		Doc 8168 Part 3 Sect. 3.4.3.5.2.2	5 degrees				
	Magnetic variation		The angular difference between True North and Magnetic North.							
Angle		Angle	The magnetic variation angle value		Annex 15 App 1 AD 2.2.5) Annex 14 App 5 Table A5-3	1 degree	essential	surveyed	1 degree	1 degree
	Date	Date	The date on which the magnetic variation had the corresponding value.		Annex 15 App 1 AD 2.2.5)					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Reference point	Annual change	Value	The annual rate of change of the magnetic variation.		Annex 15 App 1 AD 2.2 5)					
	Position	Point	The designated geographical location of an aerodrome.							
			Geographical location of aerodrome reference point.		Annex 15 App 1 AD 2.2 1) Annex 14 2.2.3	30 m	routine	surveyed/ calculated	1 sec	1 sec
		Site	The location of the reference point on the aerodrome.		Annex 15 App 1 AD 2.2 1)					
		Direction	Direction of aerodrome reference point from centre of the city or town which the aerodrome serves		Annex 15 App 1 AD 2.2 2)					
		Distance	Distance of aerodrome reference point from centre of the city or town which the aerodrome serves		Annex 15 App 1 AD 2.2 2)					
					A device to indicate visually the direction currently designated for landing and for take-off.					
Landing direction indicator	Location	Text	Location of landing direction indicator		Annex 15 App 1 AD 2.15 2)					
	Lighting	Text	Lighting of landing direction indicator	if any	Annex 15 App 1 AD 2.15 2)					
Secondary Power Supply										
	Characteristics	Text	The description of the secondary power supply		Annex 15 App 1 AD 2.15					
	Switch-over time	Value	Secondary power supply switch-over time		Annex 15 App 1 AD 2.15 4) Annex 15 App 1 AD 3.15 4)					
Anemometer										
	Location	Text	Device used for measuring wind speed Location of anemometer		Annex 15 App 1 AD 2.15 2)					
	Lighting	Text	Lighting of anemometer	if any	Annex 15 App 1 AD 2.15 2)					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
ABN / IBN			Aerodrome beacon / identification beacon used to indicate the location of an aerodrome from the air.							
	Location	Text	Location of aerodrome beacon/identification beacon	if any	Annex 15 App 1 AD 2.15 1) Annex 15 App 1 AD 3.15 1)					
	Characteristics	Text	Description of aerodrome beacon/identification beacon		Annex 15 App 1 AD 2.15 1) Annex 15 App 1 AD 3.15 1)					
	Hours of operation	Schedule	Hours of operation of aerodrome beacon/identification beacon		Annex 15 App 1 AD 2.15 1) Annex 15 App 1 AD 3.15 1)					
Wind Direction Indicator										
	Location	Text	Location of Wind direction indicator		Annex 15 App 1 AD 3.15 2)					
RVR observation site	Lighting	Text	Lighting of Wind direction indicator		Annex 15 App 1 AD 3.15 2)					
			The observation site of Runway Visual Range.							
Frequency Area	Position	Point	Geographical location of runway visual range (RVR) observation sites		Annex 4 Ch 13 l)					
			Designated part of a surface movement area where a specific frequency is required by air traffic control or ground control.		AMDB					
	Station	Text	Name of the station providing the service		AMDB					
Hot spot	Frequency	Value	Frequency of the station providing the service		AMDB					
	Boundary	Polygon	Area boundary of the frequency area		AMDB					
			A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.		Annex 4 13.6 h) 14.6 e)					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Identifier		Text	The identifier of the hot spot		AMDB					
	Annotation	Text	Additional information about the hot spot		Annex 4 13.6 h)					
	Geometry	Polygon	The geographical area of the hot spot		Annex 4 13.6 h) AMDB					
Runway										
Designator		Text	A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft. (Annex 14) The full textual designator of the runway, used to uniquely identify it at an aerodrome/heliport which has more than one. E.g. 09/27, 02R/20L, RWY 1.		Annex 15 App 1 AD 2.12 1) Annex 14 2.5.1 a)					
Nominal length		Distance	The declared longitudinal extent of the runway for operational (performance) calculations.		Annex 15 App 1 AD 2.12 3) Annex 14 2.5.1 a)	1m	critical	surveyed	1 m or 1 ft	1 m
Nominal width		Distance	The declared transversal extent of the runway for operational (performance) calculations.		Annex 15 App 1 AD 2.12 3) Annex 14 2.5.1 a)	1m	essential	surveyed	1 m or 1 ft	1 m
Geometry		Polygon	Geometries of RunwayElement, RunwayDisplacedArea and RunwayIntersection		AMDB					
Centre line points										
RWY exit line	Position	Point	The geographical location of runway centre line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway		Annex 4 Ch 3 and 4, 5 AMDB	1m	critical	surveyed		
	Elevation	Elevation	The elevation of the corresponding centre line point.		Annex 4 Ch 3 and 4, 5 AMDB	0.25m	critical	surveyed		
	Geoid undulation	Height	The geoid undulation at the corresponding centre line point		AMDB					
Exit guidance line		Line	The geographical location of the runway exit line		Annex 14 AMDB	0.5m	essential	surveyed	1/100 sec	1 sec
Colour		Text	Colour of runway exit line		AMDB					
Style		Text	Style of runway exit line		AMDB					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Surface type	Directionality	Code List	Directionality of RWY exit line (one-way or two-way)		AMDB					
		Text	The surface type of the runway defined as specified in Annex 14 Volume I		Annex 15 App 1 AD 2.12 4) Annex 14 I 2.5.1 a)					
Strength					Annex 15 App 1 AD 2.12 4)					
	PCN	Text	Pavement classification number		Annex 14 I 2.6.2 a)					
	Pavement type	Text	Pavement type for ACN-PCN determination		Annex 14 I 2.6.2 b)					
	Subgrade category	Text	Subgrade strength category		Annex 14 I 2.6.2 c)					
	Allowable pressure	Text	Maximum allowable tire pressure category or maximum allowable tire pressure value		Annex 14 I 2.6.2 c)					
	Evaluation method	Text	The evaluation method used		Annex 14 I 2.6.2 c)					
Strip			A defined area including the runway and the stop-way if provided a) to reduce the risk of damage to aircraft running off a runway; and b) to protect aircraft flying over it during take-off or landing operations							
	Length	Distance	The longitudinal extent of the runway strip.		Annex 15 App 1 AD 2.12 10) Annex 14 I 2.5.1 b)					
Shoulder	Width	Distance	The transversal extent of the runway strip		Annex 15 App 1 AD 2.12 10) Annex 14 I 2.5.1 b)					
	Surface type	Text	The surface type of the runway strip		Annex 14 I 2.5.1 b)					
	Transverse slope	Value	The transverse slope of the runway strip		Annex 14 I 3.1.19					
Shoulder	Longitudinal slope	Value	The longitudinal slope of the runway strip		Annex 14 I 3.4.13					
			An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.							

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Geometry	Polygon	The geographical location of the shoulders		AMDB					
	Surface type	Text	The surface type of the shoulder		AMDB					
	Width	Distance	The transversal extent of the shoulder		Annex 14 App 5 Table A5-5	1m	essential	surveyed	1 m or 1 ft	
Blastpad			Specially prepared surface placed adjacent to the end of a runway to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their take-off roll. (Ref. FAA AC150/5300-18)		AMDB					
Obstacle free zone	Geometry	Polygon	The geographical location of the blastpad		AMDB					
	Text	Text	Description of obstacle-free zone for a precision approach runway category I	when provided	Annex 15 App 1 AD 2.12 11) Annex 14 2.5.1 a)					
RWYmarking	Type	Text	Type of runway marking		AMDB					
	Description	Text	Description of the runway markings		Annex 14 2.5.1 g) Annex 15 App 1 AD 2.9 2)					
RWY center line LGT	Geometry	Polygon	The geographical location of the runway marking		AMDB					
	Length	Distance	The longitudinal extent of runway centre line lights		Annex 15 App 1 AD 2.14 6) Annex 14 2.5.1 g)					
	Spacing	Distance	Spacing of runway centre line lights		Annex 15 App 1 AD 2.14 6) Annex 14 2.5.1 g)					
	Colour	Text	Colour of runway centre line lights		Annex 15 App 1 AD 2.14 6) Annex 14 2.5.1 g)					
	Intensity	Text	Intensity of runway centre line lights		Annex 15 App 1 AD 2.14 6) Annex 14 2.5.1 g)					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Position	Point	Geographical location of each individual light of the runway center line lights		AMDB					
RWY Edge LGT	Length	Distance	Length of runway edge lights		Annex 15 App 1 AD 2.14 7) Annex 14 I 2.5.1 g)					
	Spacing	Distance	Spacing of runway edge lights		Annex 15 App 1 AD 2.14 7) Annex 14 I 2.5.1 g)					
	Colour	Text	Colour of runway edge lights		Annex 15 App 1 AD 2.14 7) Annex 14 I 2.5.1 g)					
	Intensity	Text	Intensity of runway edge lights		Annex 15 App 1 AD 2.14 7) Annex 14 I 2.5.1 g)					
	Position	Point	Geographical location of each individual light of the runway edge lights		AMDB					
	Restriction	Text	Description of restrictions imposed on runway		AMDB					
Runway Direction										
Designator		Text	The full textual designator of the landing and take-off direction. Examples: 27, 35L, 01R.		Annex 15 App 1 AD 2.12 1) Annex 14 I 2.5.1 a)					
True bearing		Bearing	The true bearing of the runway.		Annex 15 App 1 AD 2.12 2) Annex 14 I 2.5.1 a)	1/100 deg	Routine	surveyed	1/100 degree	1 degree
Type		Text	Type of runway: precision (CAT I, II, III) / non-precision / non-instrument		Annex 14 I 2.5.1 a)					
Threshold			The beginning of that portion of the runway usable for landing.							
	Position	Point	Geographical location for runway threshold		Annex 15 App 1 AD 2.12 5) Annex 14 I 2.5.2	1m	critical	surveyed	1/100 sec	1 sec

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Elevation	Elevation	Elevation of the runway threshold		Annex 15 App 1 AD 2.12 6) Annex 14 2.3.2			See Note 1)		
	Geoid undulation	Height	WGS-84 Geoid undulation at runway threshold position		Annex 15 App 1 AD 2.12 5) Annex 14 2.3.2			See Note 2)		
	Type	Text	The indication if the threshold is displaced/ not displaced. A displaced threshold is not located at the extremity of a runway.		Annex 4 13.6 d)					
	Displacement	Distance	Distance of displaced threshold	If displaced threshold	Annex 14 App 5 Table A5-5	1m	routine	surveyed		
Runway end		Point	Geographical location of the end position of the runway direction		Annex 15 App 1 AD 2.12 5)	1m	critical	surveyed	1/100 sec	1 sec
Touchdown zone			The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.							
	Elevation	Elevation	Highest elevation of the touchdown zone of a precision approach runway	precision approach RWY	Annex 14 2.3.3	0.25 m or 0.25 ft				
Slope	Slope	Value	The slope of the runway touchdown zone		AMDB					
		Value	Slope of the runway		Annex 15 App 1 AD 2.12 7) Annex 14 2.5.1 a)					
LAHSO			Land and Hold Short Operations		AMDB					
	Geometry	Line	Geographical location of Land and Hold Short Operations (LAHSO)		AMDB					
Displaced area	ldp	Text	Name of runway or taxiway being protected		AMDB					
			That portion of a runway between the beginning of the runway and the displaced threshold.		AMDB					
	Geometry	Polygon	Geographical location of the displaced area		AMDB					
	PCN	Text	Pavement classification number of the displaced area		AMDB					
	Surface type	Text	The surface type of the displaced area		AMDB					
	Aircraft	Text	Usage restriction for specific aircraft type		AMDB					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.		
Stopway	restriction		A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.									
		Length	Distance	The longitudinal extent of stopway	if any	Annex 15 App 1 AD 2.12 8) Annex 14 I 2.5.1 b)	1m	critical	surveyed	1 m or 1 ft	1 m	
		Width	Distance	Width of the stopway		Annex 15 App 1 AD 2.12 8) Annex 14 I 2.5.1 b)	1m	critical	surveyed	1 m or 1 ft	1 m	
		Geometry	Polygon	Geographical location of the stopway		AMDB						
		Slope	Value	Slope of stopway		Annex 15 App 1 AD 2.12 7)						
		Surface type	Text	The surface type of the stopway		Annex 15 App 1 AD 2.12 4) Annex 14 I 2.5.1 b)						
Clearway			A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.									
	Length	Distance	The longitudinal extent of the clearway		Annex 15 App 1 AD 2.12 9) Annex 14 I 2.5.1 f)	1m	essential	surveyed	1 m or 1 ft			
	Width	Distance	The transversal extent of the clearway		Annex 15 App 1 AD 2.12 9) Annex 14 I App 5 Table A5-5	1m	essential	surveyed	1 m or 1 ft			
	Ground profile		The vertical profile (or slope) of the clearway	if any	Annex 14 I 2.5.1 f)							

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Touchdown zone lights	Position	Point	Geographical location of each individual light of the threshold and wing bar lights		AMDB					
	Lenght	Distance	The longitudinal extent of the runway touchdown zone lights		Annex 14 I 2.5.1.g)					
Visual approach slope indicator system	Position	Point	Geographical location of each individual light of the touchdown zone lights		AMDB					
	MEHT	Height	Minimum Eye Height over the Threshold		Annex 14 I 2.12 e)					
	Location	Point	Geographical location of Visual approach slope indicator system		Annex 4 12.10.5					
	Angle	Angle	Nominal approach slope angle(s)		Annex 14 I 2.12 c)					
	Type	Text	Type of VGSI (VASI, PAPI etc.)		Annex 15 App 1 AD 2.14 4) Annex 14 I 2.12 b)					
	Displacement angle	Angle	Where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right		Annex 14 I 2.12 c)					
Arresting gear	Displacement direction	Text	Where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right		Annex 14 I 2.12 c)					
Arresting system	Line	Line	Geographical location of the aresting gear cable across the runway		AMDB					
	Geometry	Polygon	High energy absorbing material located at the end of a runway or stopway designed to crush under the weight of an aircraft as the material exerts deceleration forces on the aircraft landing gear.		AMDB					
	Geometry	Polygon	The geographical location of the arresting system		AMDB					

Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Radio altimeter area	Setback	Distance	Setback of the arresting system		AMDB					
	Length	Distance	The longitudinal extent of arresting system		AMDB					
	Width	Distance	The transverse extent of arresting system		AMDB					
Length		Distance	The longitudinal extent of radio altimeter area		Annex 14 I 3.8					
	Width	Distance	The transverse extent of radio altimeter area		Annex 14 I 3.8					
	Geometry	Polygon	Geographical location of radio altimeter area		Annex 14 I 3.8					

Note 1)	Threshold elevation for runways with non-precision approaches	0.5m	essential	surveyed	1 m or 1 ft	1 m or 1 ft
	Threshold elevation for runways with precision approaches	0.25m	critical	surveyed	0.1 m or 0.1 ft	0.5 m or 1 ft
Note 2)	WGS-84 geoid undulation at runway threshold, non-precision approaches	0.5m	essential	surveyed	1 m or 1 ft	1 m or 1 ft
	WGS-84 geoid undulation at runway threshold, precision approaches	0.25m	critical	surveyed	0.1 m or 0.1 ft	0.5 m or 1 ft

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
FATO	Threshold point			Final approach and take-off area. A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by helicopters operated in performance class 1, the defined area includes the rejected take-off area available.							
				The beginning of that portion of the FATO usable for landing.		Annex 14 II 2.4.2					
		Position	Point	Geographical location of FATO threshold point		Annex 14 II App 1 Table A1-1	1m	critical	surveyed	1/100 sec	1 sec
	Elevation	Elevation	Elevation of the FATO threshold		Annex 14 II App 1 Table A1-2						
See Note 1)											

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Geoid undulation	Height	WGS-84 Geoid undulation at FATO threshold position		Annex 14 II App 1 Table A1-2			See Note 2)		
	Type		Text	Type of FATO according to ICAO Heliport Manual (Doc 9261)		Annex 14 II 2.4 c)					
	Designation		Text	The full textual designator of the landing and take-off area.		Annex 14 II 2.4 c) AMDB					
	Length		Distance	The longitudinal extent of FATO		Annex 14 II App 1 Table A1-5	1m	critical	surveyed	1 m or 1 ft	1 m
	Width		Distance	The transversal extent of FATO		Annex 14 II 2.4 c)					
	Geometry		Polygon	Geographical location of FATO element		AMDB					
	Slope		Value	The slope of FATO		Annex 14 II 2.4 c)					
	Surface type		Text	The surface type of FATO		Annex 15 AD 2.16 3) AMDB					
	True bearing		Bearing	The true bearing of the runway		Annex 14 II App 1 Table A1-4	1/100 deg	routine	surveyed	1/100 degree	
	Declared distances					Annex 14 II 2.5					
		TODAH	Distance	Take-off distance available - The length of the FATO plus the length of helicopter clearance (if provided)	and if applicable, alternative reduced declared distances;	Annex 15 App 1 AD 3.13 1) Annex 14 II 2.5 a)	1m	critical	surveyed	1 m or 1 ft	
		RTODAH	Distance	Rejected Take-off distance available - The length of the FATO declared available and suitable for helicopters operated in performance class 1 to complete a rejected take-off.		Annex 15 App 1 AD 3.13 2) Annex 14 II 2.5 b)					
		LDAH	Distance	Landing distance available - The length of the FATO plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.		Annex 15 App 1 AD 3.13 3) Annex 14 II 2.5 c)	1m	critical	surveyed	1 m or 1 ft	

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Remarks	Text	Remarks including entry or start point where alternative reduced declared distances have been declared		Annex 15 App 1 AD 2.13					
	FATO marking	Description	Text	Description of FATO markings		Annex 4 13.6.2 g)					
	Approach lighting system					Annex 15 AD 2.16 6) / 3.14 3)					
		Type	Text	Classification of the approach lighting system using as criteria the ICAO Annex 14 standards		Annex 15 AD 2.16 6) / 3.14 3)					
		Length	Distance	The longitudinal extent of approach lighting system.		Annex 15 AD 2.16 6) / 3.14 3)					
		Intensity	Text	A code indicating the relative intensity of the lighting system.		Annex 15 AD 2.16 6) / 3.14 3)					
		Position	Point	Geographical location of each individual light of the approach lighting system		AMDB					
	Area lights										
		Description	Text	Description of area lights		Annex 15 AD 2.16 6) / 3.14 3)					
		Position	Point	Geographical location of each individual light of the area lights		AMDB					
	Aiming point lights										
		Description	Text	Description of aiming point lights		Annex 15 App 1 AD 3.14 4)					
		Position	Point	Geographical location of each individual light of the aiming point lights		AMDB					
	TLOF										
	Designator										
	Centre point										
		Position	Point	Geographical location of TLOF threshold point		Annex 15 App 1 AD 2.16 1)	1m	critical	surveyed	1/100 sec	1 sec

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
		Elevation	Elevation	Elevation of the TLOF threshold		Annex 15 App 1 AD 2.16 2)			See Note 1)			
		Geoid undulation	Height	WGS-84 Geoid undulation TLOF centre point position		Annex 15 App 1 AD 2.16 1)			See Note 2)			
	Length		Distance	The longitudinal extent of TLOF		Annex 14 II 2.4.1 b)	1m	critical	surveyed	1 m or 1 ft	1 m	
	Width		Distance	The transversal extent of TLOF		Annex 14 II 2.4.1 b)	1m	critical	surveyed	1 m or 1 ft	1 m	
	Geometry		Polygon	Geographical location of TLOF element		AMDB						
	Slope		Value	The slope of TLOF		Annex 4 13.6.2 b)						
	Surface type		Text	The surface type of TLOF		Annex 4 13.6.2 b)						
	Bearing strength		Value	The bearing strength of TLOF		AMDB Annex 4 13.6.2 b)				1 tone		
	Visual approach slope indicator system type		Text	Type of visual approach slope indicator system		Annex 15 App 1 AD 3.14 2) Annex 14 I 2.12 b)						
	Marking											
	Safety area		Description	Text	Description of TLOF markings		Annex 4 13.6.2 g)					
					A defined area on a heliport surrounding the FATO which is free of obstacles, other than those required for air navigation purposes, and intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.							
Length			Distance	The longitudinal extent of safety area		Annex 4 Ch 13 Annex 14 II 2.4.1 d)						
Width			Distance	The transversal extent of safety area		Annex 4 Ch 13 Annex 14 II 2.4.1 d)						

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Helicopter clearway	Surface type		Text	The surface type of safety area		Annex 4 Ch 13 Annex 14 II 2.4.1 d)					
				A defined area on the ground or water, selected and/or prepared as a suitable area over which a helicopter operated in performance class 1 may accelerate and achieve a specific height.		Annex 14 II definition					
	Length		Distance	The longitudinal extent of the helicopter clearway		Annex 14 II 2.4.1 g)					
	Ground profile			Vertical profile (or slope) of helicopter clearway		Annex 14 II 2.4.1 g)					

Note 1)	FATO threshold, for heliports with or without a PinS approach						0.5m	essential	surveyed	1 m or 1 ft	
	FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2						0.25m	critical	surveyed	1 m or 1 ft (non-precision) 0.1 m or 0.1 ft (precision)	
Note 2)	WGS-84 geoid undulation at FATO threshold, TLOF geometric centre, for heliports with or without a PinS approach						0.5m	essential	surveyed	1 m or 1 ft	
	WGS-84 geoid undulation at FATO threshold, TLOF geometric centre, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2						0.25m	critical	surveyed	1 m or 1 ft (non-precision) 0.1 m or 0.1 ft (precision)	

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Apron				A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Taxiway	Designator		Text	The full textual name or designator used to identify an apron at an aerodrome/heliport which has more than one.		Annex 15 App 1 AD 2.8 1)						
	Geometry		Polygon	Geographical location of the apron element		Annex 14 AMDB	1m	routine	surveyed	1/10 sec	1 sec	
	Type		Text	Classification of the primary use for the apron		AMDB						
	Aircraft restriction		Text	Usage restriction (prohibition) for specified aircraft type		AMDB						
	Surface type		Text	The surface type of the apron		Annex 15 App 1 AD 2.8 1) Annex 14 2.5.1 d)						
	Strength											
			PCN	Text	Pavement classification number of apron		Annex 15 App 1 AD 2.8 1) Annex 14 2.6.2.a)					
			Pavement type	Text	Pavement type for ACN-PCN determination		Annex 15 App 1 AD 2.8 1) Annex 14 2.6.2 b)					
			Subgrade category	Text	Subgrade strength category of apron		Annex 15 App 1 AD 2.8 1) Annex 14 2.6.2 c)					
			Allowable pressure	Text	Maximum allowable tire pressure category or maximum allowable tire pressure value		Annex 15 App 1 AD 2.8 1) Annex 14 2.6.2 c)					
			Evaluation method	Text	The evaluation method used to determine the apron strength		Annex 15 App 1 AD 2.8 1) Annex 14 2.6.2 c)					
	Elevation			Elevation	The elevation of the apron		Annex 4 14.6 a)					
				A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.								
Designator			Text	The full textual designator of the taxiway.		Annex 15 App 1 AD 2.8 2) Annex 14 2.5.1 c)						
Width			Distance	The transversal extent of the taxiway.		Annex 15 App 1	1m	essential	surveyed	1 m or 1 ft		

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Geometry		Polygon	Geographical location of the taxiway element		AD 2.8.2) Annex 14 I 2.5.1 c)					
	Bridge		Text	Type of bridge (none, overpass, underpass)		AMDB					
	Surface type		Text	Surface type of taxiway		Annex 15 App 1 AD 2.8.2) Annex 14 I 2.5.1 c) AMDB					
	Strength					Annex 15 App 1 AD 2.8.2)					
		PCN	Text	Pavement classification number of taxiway		Annex 14 I 2.6.2.a)					
		Pavement type	Text	Pavement type for ACN-PCN determination		Annex 14 I 2.6.2 b)					
		Subgrade category	Text	Subgrade strength category of taxiway		Annex 14 I 2.6.2 c)					
		Allowable pressure	Text	Maximum allowable tire pressure category or maximum allowable tire pressure value		Annex 14 I 2.6.2 c)					
		Evaluation method	Text	The evaluation method used to determine the taxiway strength		Annex 14 I 2.6.2 c)					
	Aircraft restrictions		Text	Usage restriction (prohibition) for specified aircraft type		Annex 4 14.6 d)					
	Center line points										
		Position	Point	Geographical coordinates of taxiway center line points		Annex 14 I 2.5.3	0.5m	essential	surveyed	1/100 sec	1/100 sec
		Elevation	Elevation	Elevation of taxiway center line points		Annex 14 I App 5 Table A5-2	1m	essential	surveyed		
	Shoulder			An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.							
		Geometry	Polygon	Geographical location of the taxiway shoulder		AMDB					
		Surface type	Text	Surface type of taxiway shoulder		AMDB					
		Width	Distance	The transversal extent of the taxiway shoulder		Annex 14 I App 5 Table A5-5	1m	essential	surveyed	1 m or 1 ft	
	Guidance lines					Annex 15 App 1 AD 2.9.1)					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
	Taxiway intersection marking line	Geometry	Line	Geographical location of guidance lines		Annex 15 App 7 Annex 4 App 6 Annex 14 App 5 AMDB	0.5 m	essential	surveyed	1/100 sec	1/100 sec	
		Colour	Text	Colour of taxiway guidance lines		AMDB						
		Style	Text	Style of taxiway guidance lines		AMDB						
		Wingspan	Value	Wingspan		AMDB						
		Maxspeed	Value	Maximum speed		AMDB						
		Direction	Text	Direction		AMDB						
		Taxiway intersection marking line	Line		Taxiway intersection marking line		Annex 15 App 5 Annex 4 App 6 Annex 14 App 5	0.5 m	essential	surveyed	1/100 sec	1 sec
		Taxiway marking										
		Taxiway edge lights	Description	Text	Description of taxiway marking		Annex 14 5.2.1 g) Annex 15 App 1 AD 2.9.2)					
		Taxiway edge lights	Description	Text	Description of taxiway edge lights		Annex 15 App 1 AD 2.15.3) Annex 14 2.5.1 g) AMDB					
Taxiway centre line lights	Position	Point	Geographical location of each individual light of the taxiway edge lights									
Taxiway centre line lights	Description	Text	Description of taxiway centre line lights		Annex 15 App 1 AD 2.15.3) Annex 14 2.5.1 g) AMDB							
Stop bars	Description	Text	Description of the stop bars	if any	Annex 15 App 1 AD 2.9.3)							
Runway	Location	Line	Location of the stop bar									

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Helicopter air taxiway	Intersection marking line		Line	Helicopter ground taxiway intersection marking line		Annex 14 II Annex 14 II App 1 A1-1	0.5 m	essential	surveyed	1/100 sec	1 sec	
	Lighting	Description	Text	Description of helicopter ground taxiway light		Annex 14 II 2.4.1 h)						
			Point	Geographical location of each individual light of the helicopter ground taxiway lights		AMDB						
	Marking	Description	Text	Description of helicopter ground taxiway marking		Annex 14 II 2.4.1 h)						
				A defined path on the surface established for the air taxiing of helicopters. (Annex 14)								
	Helicopter air taxiway	Designator			The full textual designator of helicopter air taxiway		Annex 4 13.6.1 g)					
		Center line points		Point	Geographical location of helicopter air taxiway center line points		Annex 14 II 2.4.3 App 1 A1-1	0.5m	essential	surveyed/ calculated		
		Elevation		Elevation	Elevation of helicopter air taxiway		Annex 14 II App 1 A1-2	1m	essential	surveyed		
		Width		Distance	The transversal extent of the helicopter air taxiway		Annex 14 II 2.4.1 e)	1m	essential	surveyed		
		Surface type		Text	Surface type of helicopter air taxiway		Annex 14 II 2.4.1 e)					
Lighting		Description	Text	Description of helicopter air taxiway lighting		Annex 14 II 2.4.1 h)						
			Point	Geographical location of each individual light of the helicopter air taxiway lights		AMDB						
				Description of helicopter air taxiway marking		Annex 14 II 2.4.1 h)						
Helicopter air transit routes		Designator	Text	Designator of helicopter air transit route	A defined path established for the movement of helicopters from one part of a heliport to another. A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.		Annex 4 13.6.1 g)					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Geometry		Line	Geographical location of helicopter air transit route		Annex 4 13.6.1 g)					
	Width		Distance	The transversal extent of the helicopter air transit route		Annex 15 App 1 AD 3.8 3)	1m	essential	Surveyed		
INS checkpoint											
	Location		Point	Geographical location of the INS check point	where available	Annex 15 App 1 Table A7-1	0.5m	routine	surveyed	1/100 sec	1/100 sec
VOR checkpoint											
	Location		Point	Geographical location of the VOR check point	where available	Annex 15 App 1 AD 2.8 4) Annex 14 2.5.1 h)					
	Frequency		Value	Frequency of the VOR check point		Annex 14 2.5.1 h)					
Altimeter checkpoint											
	Location		Point	Geographical location of altimeter checkpoints		Annex 15 App 1 AD 2.8 3) Annex 14 2.7.1					
	Elevation		Elevation	Elevation of altimeter checkpoints		Annex 15 App 1 AD 2.8 3) Annex 14 2.7.3					
Aircraft stand											
	Name		Text	A designated area on an apron intended to be used for parking an aircraft		AMDB					
	Acraft stand points	Location	Point	Geographical location of aircraft stand point		Annex 14 2.5.4	0.5m	routine	surveyed	1/100 sec	1/100 sec
	Identification sign	Aircraft types	Code list	Aircraft types		AMDB					
	Visual docking parking guidance system		Text	Description of aircraft stand identification sign		Annex 15 App 1 AD 2.9 1) Annex 14 5.4.6					
	Parking stand area		Text	Description of visual docking/parking guidance system at the aircraft stand		Annex 15 App 1 AD 2.9 1) Annex 14 2.5.1 g)					
			Polygon	Geographical location of parking stand area		AMDB					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Helicopter stand	Jetway		Code list	Jetway available at aircraft stand		AMDB						
	Fuel		Code list	Fuel available at aircraft stand		AMDB						
	Ground power		Code list	Ground power available at aircraft stand		AMDB						
	Towing		Code list	Towing available at aircraft stand		AMDB						
	Terminal		Text	Terminal building reference		AMDB						
	Surface type		Text	Surface type of the aircraft stand		AMDB						
	Aircraft restriction		Text	Usage restriction (prohibition) for specified aircraft type		AMDB						
	PCN		Text	Pavement classification number of aircraft stand		AMDB						
	Stand guidance line											
			Geometry	Line	Geographical location of stand guidance line		AMDB	0.5m	essential	surveyed	1/100 sec	
			Elevation	Elevation	Parking guidance line points elevation		Annex 14 App. 5	1m	essential	surveyed		
			Direction	Text	Direction of stand guidance line		AMDB					
			Wingspan	Value	Wingspan		AMDB					
		Colour	Code list	Colour of stand guidance line		AMDB						
		Style	Code list	Style of stand guidance line		AMDB						
Helicopter stand				An aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations. (Annex 14)								
	Name		Text	Name of helicopter stand								
	Location		Point	Geographical location of helicopter stand point/INS checkpoints		Anex 14 II 2.4.4 Annex 14 II A1-1	0.5m	essential	surveyed	1/100 sec		
De-icing area				A facility where frost, ice or snow is removed (de-icing) from the aeroplane to provide clean surfaces, and/or where clean surfaces of the aeroplane receive protection (anti-icing) against the formation of frost or ice and accumulation of snow or slush for a limited period of time.								
	Identifier		Text	Identifier of de-icing area		AMDB						
	Geometry		Polygon	Geographical location of de-icing area		AMDB	1m	routine	surveyed	1/10 sec	1 sec	
	Surface type		Text	The surface type of the deicing area		Annex 14 2.5.1 d)						

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	ldbase		Text	Name of underlying Taxiway, Parkingstand or Apron Element		AMDB					
	Aircraft restriction		Text	Usage restriction (prohibition) for specified aircraft type		AMDB					
Communication facility											
	Service designation		Text	Designation of the service provided		Annex 15 App 1 AD 2.18.1)					
	Call sign		Text	Call sign of the communication facility		Annex 15 App 1 AD 2.18.2)					
	Channel		Text	Channel of the communication facility		Annex 15 App 1 AD 2.18.3)					
	Logon address		Text	The logon address of the facility	as appropriate	Annex 15 App 1 AD 2.18.4)					
	Hours of operation		Schedule	Operational hours of the station serving the unit		Annex 15 App 1 AD 2.18.5)					

Table A1-2 - Airspace data

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
ATS Airspace	Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.											
	Type		Text	Type of ATS airspace according to ICAO Annex 11.		Annex 15 App 1 ENR 2.1 Annex 11 2.5;						
	Designation		Text	The designator given to an airspace by a responsible authority		Annex 15 App 1 ENR 2.1 1) Annex 11 2.1.1.3;						
	Lateral limits		Polygon	The surface defining the horizontal shape of the Airspace		Annex 15 App 1 ENR 2.1 1) Annex 11 2.10/ App 5 T1;			see Note 1)			
	Vertical limits											
		Upper limit		Altitude	The upper limit of the airspace		Annex 15 App 1 ENR 2.1 2) Annex 11 2.10;					
		Lower limit		Altitude	The lower limit of the airspace		Annex 15 App 1 ENR 2.1 2) Annex 11 2.10;					
	Class of airspace		Value	A categorisation of airspace which determines the operating rules, flight requirements, and services provided.		Annex 15 App 1 ENR 2.1 3) Annex 11 2.6/ App 4;						
	Transition altitude		Altitude	The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.		Annex 15 App 1 AD 2.17 5)						
	Hours of applicability		Schedule	The hours of applicability of the airspace		Annex 15 App 1 AD 2.17 6)						
	ATS Unit			Unit providing service								
		Name		Text	The name of the unit providing the service		Annex 15 App 1 ENR 2.1, AD 2.17					
		Call sign			The call sign of the aeronautical station serving the unit		Annex 15 App 1 ENR 2.1, AD 2.17					
		Language		List code	Information on the language(s) used, specifying area and conditions, when and where to be used, if applicable		Annex 15 App 1 ENR 2.1, AD 2.17					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Applicability	Text	Information on the area and conditions when to be used		Annex 15 App 1 ENR 2.1					
		Hours of service	Schedule	Operational hours of the station serving the unit		Annex 15 App 1 ENR 2.1, AD 2.17					
	Frequency	Value	Value	The frequency of the ATS airspace		Annex 15 App 1 ENR 2.1					
		Purpose	Text	Indications for specific purposes of the frequency		Annex 15 App 1 ENR 2.1					

Note 1)	FIR, UIR TMA, CTA CTR	2 km 100 m 100 m	routine essential essential	declared calculated calculated	1 min 1 sec 1 sec	as plotted as plotted as plotted
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Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Special activity airspace	Type		Code list	Type of special activity airspace (See Note 1)		Annex 15 ENR 5.1, 5.2, 5.3						
	Identification		Text	The identification assigned to uniquely identify the airspace		Annex 15 ENR 5.1 1)						
	Name		Text	The name given to the airspace by a responsible authority		Annex 11 2.31						
	Lateral limits		Polygon	The surface defining the horizontal shape of the airspace		Annex 14 ENR 5.1 1)						
	Vertical limits						Annex 15 ENR 5.1, 5.2, 5.3				See Note 2) for P,R,D Areas only	
		Upper limit	Altitude		The upper limit of the airspace		Annex 15 ENR 5.1, 5.2, 5.3					
		Lower limit	Altitude		The lower limit of the airspace		Annex 15 ENR 5.1, 5.2, 5.3					
	Restriction		Text	Type of restriction or nature of hazard		Annex 15 ENR 5.1, 5.2, 5.3						

Table AI-3 - ATS routes data

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Route				A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services								
	Designator		Text	Designators for ATS routes according to Annex 11 Appendix 1 (or Appendix 3 for standard departure and arrival routes)	Annex 11 2.12 / App 1 / App3							
	Designator prefix		Text	The prefix of the route designator as specified in Note 1)	Annex 11 App1							
	Flight rules		Code list	Information on the flight rules that apply on the route (IFR / VFR)								
Route segment	Navigation specification		Text	Designation of the navigation specification(s) applicable to a specified segment(s) - 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.	Annex 15 App 1 ENR 3.1-4 1)							
	From point			Reference to the first point of a route segment								
	To point	Name	Text	The coded designators or name-codes of significant point (waypoint or navaid)		Annex 15 App 1 ENR 3.1-4 1)						
		Reporting	Text	Indication of ATS / MET reporting requirement "compulsory", "on-request" or "nil"		Annex 15 App 1 ENR 3.1-4 1)						
				Reference to the second point of a route segment								
	Name	Text	The coded designators or name-codes of significant point (waypoint or navaid)		Annex 15 App 1 ENR 3.1-4 1)							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Reporting	Text	Indication of the ATS / MET reporting requirement "compulsory", "on-request" or "nil"		Annex 15 App 1 ENR 3.1-4 1)					
	Track		Bearing	Tracks (The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid)) or VOR radials bearing (for PBN routes)		Annex 11 App 5 Table 4 Annex 15 App 1 ENR 3.1-4 2)	1/10 degree (terminal arrival departure)	routine (terminal arrival departure)	calculated (terminal arrival departure)	1 degree (terminal arrival departure)	1 degree (terminal arrival departure)
	Change over point		Point	The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.	in case of VOR radial	Annex 15 App 1 ENR 3.1-4 2)					
	Length		Distance	The geodesic distance between start and end point		Annex 11 App 5 Table 5 Annex 15 App 1 ENR 3.1 - .4 2)/3)			See Note 2)		
	Upper limit		Altitude	The upper limit of the route segment		Annex 15 App 1 ENR 3.1 - .4 3)/4)					
	Lower limit		Altitude	The lower limit of the route segment		Annex 15 App 1 ENR 3.1 - .4 3)/4)					
	MEA		Altitude	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.		Annex 15 App 1 ENR 3.1 2)					
	MOCA		Altitude	Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.		Annex 15 App 1 ENR 3.1 4)					
	Minimum turn altitude		Altitude	Minimum turn altitude		IFPP					
	Minimum flight altitude		Altitude	Minimum flight altitude	Helicopter route	Annex 11 2.22	50 m	routine	calculated	50 m or 100 ft	50 m or 100 ft

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	unit	Name	Text	Name of the unit providing the service		Annex 15 App 1 ENR 3.1 - .4 6\7)					
		Channel	Text	Operating channel of controlling unit		Annex 15 App 1 ENR 3.1 - .4 6\7)					
		Logon address	Text	Logon address of controlling unit	if applicable	Annex 15 App 1 ENR 3.1 - .4 6\7)					

Note 1)	U) Upper	1/10 km	routine	calculated	1/10 km or 1/10 NM	1 km or 1 NM
	K) Helicopter	1/100 km	essential	calculated	1/100 km or 1/100 NM	1 km or 1 NM
	S) Supersonic T) Tacan Other					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Waypoint	Identification		Text	Names, coded designators or name-codes assigned to the significant point.		Annex 11 App 2 2,3.					
	ATC Reporting requirement		Text	Indication of ATS / MET reporting requirement "compulsory", "on-request" or "nil"		Annex 11 App 2 5.					
	Functionality		Text	Indication is a waypoint is a: Fly-by waypoint (A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure) or Flyover waypoint (A waypoint at which a turn is initiated in order to join the next segment of a route or procedure)		IFPP					
	Position		Point	Geographical location of the waypoint		Annex 11 App 5 Table 1	100 m	essential	surveyed calculated	1 sec	1 sec
	Formation	Navaid	Text	The station identification of the reference		Annex 15 App 1					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
				VOR/DME		ENR 3.3 2)a)					
		Bearing	Bearing	The bearing from the reference VOR/DME, if the waypoint is not collocated with it;		Annex 11 App 5 Table 4			See Note 1.		
		Distance	Distance	The distance from the reference VOR/DME, if the waypoint is not collocated with it;		Annex 11 App 5 Table 5			See Note 2.		
	Limitations		Text	Indication of any navigation specification(s) limitations.		IFPP					

Note 1.	Bearing used for the formation of an en-route and of a terminal fix	1/10 degree	routine	calculated	1/10 degree	1/10 degree
	Bearing used for the formation of an instrument approach procedure fix	1/100 degree	essential	calculated	1/100 degree	1/100 degree

Note 2.	Distance used for the formation of an en-route fix	1/10 km	routine	calculated	1/10 km or 1/10 NM	2/10 km (1/10 NM)
	Distance used for the formation of a terminal and instrument approach procedure fix	1/100 km	essential	calculated	1/100 km or 1/100 NM	2/10 km (1/10 NM)

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
En-route Holding				A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.							
	Identification		Text	Identification of the holding procedure		Annex 15 App 1 ENR 3.6 1)					
	Fix		Text	Identification of the holding procedure fix		Annex 15 App 1 ENR 3.6	100m	essential	surveyed calculated	1 sec	1 sec
	Waypoint		Point	Geographical location of the holding waypoint		Annex 15 App 1 ENR 3.6					
	Inbound track		Bearing	The inbound track of the holding procedure		Annex 15 App 1 ENR 3.6					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Turn Direction		Text	Direction of the procedure turn		Annex 15 App 1 ENR 3.6					
	Speed		Value	Maximum indicated airspeed		Annex 15 App 1 ENR 3.6					
	Level										
		Minimum holding level	Height	Minimum holding level of the holding procedure		Annex 15 App 1 ENR 3.6					
		Maximum holding level	Height	Maximum holding level of the holding procedure		Annex 15 App 1 ENR 3.6					
	Time/distance outbound		Value	Time/distance value of the holding procedure		Annex 15 App 1 ENR 3.6					
	Controlling unit										
		Name	Text	Indication of the controlling unit		Annex 15 App 1 ENR 3.6					
		Frequency	Value	The operating frequency of the controlling unit		Annex 15 App 1 ENR 3.6					
	RNP Accuracy Req		Text			IFPP					
	Turn Radius		Value			IFPP					
	Bank Angle		Angle			IFPP					
	Nav Spec Name		Text			IFPP					

Table A1-4 Instrument Flight Procedure Data

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.		
Procedure	Identification												
		FAS Guidance	Text	The name describing the type of radio navigation aid providing the final approach lateral guidance. This could be: ILS, VOR, RNAV, etc		ICAO DOC 8168 VOL II Part 1.4.9.5.2.1							
		Runway	Text	The runway designator of the landing and take-off direction. Examples: 27, 35L, 01R.		ICAO DOC 8168 VOL II Part 1.4.9.5.2.1							
		Circling	Text	Indication if a procedure is/ is not a circling approach		ICAO DOC 8168 VOL II Part 1.4.9.5.2.5							
		Multiple Code	Text	A single letter suffix, starting with the letter z following the radio navigation aid type shall be used if two or more procedures to the same runway cannot be distinguished by the radio navigation aid type only. For example: VOR y Rwy 20 VOR z Rwy 20		ICAO DOC 8168 VOL II Part 1.4.9.5.3							
		NS Limiter	Text	Sensor specific information in case of a limitation of use		ICAO DOC 8168 VOL II Part III.5.1.3.4							
		Name	Text	Name of the instrument flight procedure		ICAO DOC 8168 VOL II Part 1.4.9.5.2							
		Plain Language Designation											
			Basic Indicator	Text	The basic indicator shall be the name or name-code of the significant point where the standard departure route terminates.		Annex 11 Appendix 3, Paragraph 2.1.1 a) and 2.1.2	essential					
			Validity Indicator	Text	The validity indicator shall be a number from 1 to 9.		Annex 11 Appendix 3, Paragraph 2.1.1 b) and 2.1.3	essential					
	Route Indicator	Text	The route indicator shall be one letter of the alphabet. The letters "I" and "O" shall not be used.		Annex 11 Appendix 3, Paragraph 2.1.1 c) and 2.1.4	essential							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Procedure Type	Text	Indication of the type of procedure (departure, arrival, approach, other)		Annex 11 Appendix 3, Paragraph 2.1.1 d)		essential			
		Visual Indication	Text	Indication if the route has been established for use by aircraft operating in accordance with the visual flight rules (VFR)	where appropriate	Annex 11 Appendix 3, Paragraph 2.1.1 e)		essential			
	Coded Designation					Annex 11 Appendix 3, Paragraph 2.2					
		Significant Point	Text	The coded designator or name-code of the significant point		Annex 11 Appendix 3, Paragraph 2.2 a)		essential			
		Validity Indicator	Text	The Validity Indicator of the procedure		Annex 11 Appendix 3, Paragraph 2.2 b)		essential			
		Route Indicator	Text	The Route Indicator of the procedure		Annex 11 Appendix 3, Paragraph 2.2 c)		essential			
	Precision Type		Text	The instrument procedure type. Instrument approach procedures are classified as follows: Non-precision approach (NPA) procedure. An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance. Approach procedure with vertical guidance (APV). An instrument procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations. Precision approach (PA) procedure. An instrument approach procedure using precision lateral and vertical guidance with minima as determined by the category of operation.		Annex 10 Chapter 1					
	Rnav or Conventional		Text	Indication if the procedure is RNAV / Conventional		Doc 8168, Vol II, Part III, Section 5, Chapter 1, para 1.3.2.1		routine			
	Aircraft Category		Code list	Indication of which aircraft categories the procedure is intended for							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Type		Text	Indication of the type of procedure (departure, arrival, approach, other)		Annex 11 Appendix 3, Paragraph 2.1.1 d)					
	Magnetic variation		Value	The magnetic variation considered for the procedure design		ICAO Annex 4 11.8 Doc 8168, Vol II, Part I, Section 2, Chapter 1, para 1.11 and Annex, paragraph 9.7 and 10.7		routine			
	OCA(H)		Altitude/Height	The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.			as specified in Doc 8168	essential	--		
	MSA			Minimum sector altitude - The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on a radio aid to navigation.		ICAO Doc 8168, Vol II, Part 1.4.8.2					
		Sectors	Text			ICAO Doc 8168, Vol II, Part 1.4.8.2					
		Based on Fix	Text			ICAO Doc 8168, Vol II, Part 1.4.8.2					
		Altitudes	Altitude			ICAO Doc 8168, Vol II, Part 1.4.8.2					
		Restrictions	Text			ICAO Doc 8168, Vol II, Part 1.4.8.2					
		Radius	Value			ICAO Doc 8168, Vol II, Part 1.4.8.2					
	TAA			Terminal arrival altitude - The lowest altitude that will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an arc of a circle defined by a 46 km (25 NM) radius centred on the initial approach fix (IAF).		ICAO DOC 8168 VOL II III-2-4-1					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
				or where there is no IAF on the intermediate approach fix (IF), delimited by straight lines joining the extremity of the arc to the IF. The combined TAAs associated with an approach procedure shall account for an area of 360 degrees around the IF.							
		IAF	Text	TAA Initial Approach Fix reference point		ICAO DOC 8168 VOL II III-2-4-1					
		Dist To IAF	Number	The distance of the TAA area boundary from the IAF		ICAO DOC 8168 VOL II III-2-4-1					
		IF	Text	TAA Intermediate Fix reference point		ICAO DOC 8168 VOL II III-2-4-1					
		Altitude	Altitude	The terminal arrival altitude value		ICAO DOC 8168 VOL II III-2-4-1					
		Sub Sectors (brg)	Text	Areas with lower altitude in the inner area. May consist of an arc (NM) or a bearing to IAF/IF		ICAO DOC 8168 VOL II III-2-4-1					
	Nav Spec Name		Text	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.		ICAO DOC 8168 VOL II III-5-1-2 1.3.4 Annex 4, Paragraph 9.8 and 10.8		essential			
	AITF		Text			Doc 8168, Vol II, Part III, Section 5, Chapter 1, para 1.3.4		routine			
	Operating minima		Text	Aerodrome Operating Minima - The limits of usability of an aerodrome for: a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions; b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
				decision altitude/height (DA/H) as appropriate to the category of the operation; c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions							
	Temperature					ICAO DOC 8168 VOL II III-3-4-8 4.6					
		Minimum temperature	Value	Minimum temperature reference							
		Maximum temperature	Value	Maximum temperature reference							
	Remote Altitude Source		Text	Cautionary note indicating the altimetry source		ICAO DOC 8168 Vol II, Part 1, Section 4, Para 5.4.5.3.1					
	FAS Data Block		Text								
	Proc Ref Datum		Text	Airport or landing threshold							
	PBN Requirements Box		Text	Specific requirements related to a PBN procedure Any navigation sensor limitations and any required functionalities that are described as options in the navigation specification, that is, not included in the core navigation specification		ICAO DOC 8168 VOL II III-5-1-2 1.3.4		essential			
Procedure Segment											
	Start Fix		Text	Identification of the start fix							
	End Fix		Text	Identification of the end fix							
	End fix functionality		Text	Indication if the end fix is a fly-by or fly-over point							
	End fix role		Text	Indication of the role of the end fix							
	Procedure altitude/height		Altitude/Height	A specified altitude/height flown operationally a tor above the minimum altitude/height and established to accommodate a stabilized descent ata							

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
			Bearing	The bearing from the reference VOR/DME, if the waypoint is not collocated with it;					See Note 1.		
		Bearing					1/100 km	essential	calculated	1/100 km or 1/100 NM	
		Distance		The distance from the reference VOR/DME, if the waypoint is not collocated with it;							

Note 1.	Bearing used for the formation of an en-route and of a terminal fix	1/100 degree	routine	calculated	1/10 degree					1/10 degree	
	Bearing used for the formation of an instrument approach procedure fix	1/100 degree	essential	calculated	1/100 degree					1/100 degree	

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Req.	Chart Res.
Procedure Holding				A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.		Annex 4, Paragraph 9.8 and 10.8					
	Identification		Text	Identification of the holding procedure				routine			
	Fix		Point	Geographical location that serves as a reference for a holding procedure.				routine			
	Inbound Crs							routine			
	Outbound Crs							routine			
	Leg Distance/Ti							routine			
	Turn Direction			Direction of the procedure turn				routine			
	Minimum Alt							routine			
	Maximum Alt							routine			
	Speed							routine			
	RNP Accuracy Req			Maximum indicated airspeed				routine			
	Turn Radius							routine			
	Bank Angle							routine			

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Missed Apch Climb Gradient										
	CAT H Note										
	CAT D Large										
	Authorizatio n Required										
	Units of Measure										
	GNSS In-Lieu-Of										
	Comm Failure										
	Surveillance/Radar Required										
	SID Close-in Obstacle Note										
	Off-Set Alignment										
	PDG greater than 3%										
	Caution Notes		Note		Restrictions etc						
	Supplementary Tables		Text	Instrument approach procedure (IAP)	Annex 4, see 11.10.8						
	Visual Approach Procedures				No real reference to this? Visual approach procedures shall be shown where applicable.						Annex 4, 12.10.5.1

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Station declination		Angle	An alignment variation between the zero degree radial and true north, determined at the time the station is calibrated.	VOR/ILS/MLS	Annex 15 App 1 AD 2.19 1)					
	Frequency		Value	Frequency of the radio navigation aid		Annex 15 App 1 AD 2.19 3) Annex 15 App 1 GEN 4.1					
	Channel		Text	The channel number of the radio navigation aid	DME /SBAS /GBAS	Annex 10 3 Table A Annex 15 App 1 GEN 4.1					
	RPI		Code list	The reference path identifier(s) of the radio navigation aid	SBAS GBAS	Annex 15 App 1 AD 2.19 3) (AMDT 38)					
	Position		Point	Geographical location of the radio navigation aid		Annex 15 App 1 AD 2.19 5) Annex 14			See Note 2)		
	Elevation		Elevation	The elevation of the transmitting antenna of DME The elevation of GBAS reference point	DME GBAS	Annex 15 App 7 Table A7-2			See Note 3)		
	Ellipsoidal height		Height	The ellipsoid height of the GBAS reference point,	GBAS	Annex 15 App 1 AD 2.19 6) (AMDT 38)					
	LTP		Height	The ellipsoid height of the landing threshold point (LTP)	SBAS	Annex 15 App 1 AD 2.19 6) (AMDT 38)					
	FTP		Height	The ellipsoid height of the fictitious threshold point (FTP)	SBAS	Annex 15 App 1 AD 2.19 6) (AMDT 38)					
	Zero bearing direction		Text	Direction of the 'zero bearing' provided by the station. For example: magnetic north, true north	VOR	AIXM 5.1					
	Localizer alignment										
	Zero azimuth alignment	Bearing	Bearing	The bearing of the localizer	ILS Localizer	Annex 14 App 5 Table A5-4	1/100 deg	essential	surveyed	1/100 degree (if true)	1 degree
		Type	Text	Type of localizer alignment, true or magnetic	ILS Localizer						
	Angle		Bearing	MLS zero azimuth alignment	MLS	Annex 14 App 5 Table A5-4	1/100 deg	essential	surveyed	1/100 degree (if true)	1 degree
	RDH		Value	The value of the ILS Reference Datum Height (ILS	ILS GP /MLS	AIXM					
					ILS GP	Annex 11 App 5	0.5m	critical	calculated		

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
				RDH).		Table 2					
	Width course		Value	The localizer course width	ILS Localizer	AIXM					
	Localizer antenna rwy end distance		Distance	ILS localizer runway/FATO end distance	ILS Localizer	Annex 14 2.5.1 j)	3 m	routine	calculated	1 m or 1 ft	as plotted
	ILS glideslope antenna TRSH distance		Distance	ILS glideslope antenna - threshold distance along centerline	ILS GP	Annex 14 2.5.1 j)	3 m	routine	calculated	1 m or 1 ft	as plotted
	ILS marker TRSH distance		Distance	ILS marker - threshold distance	ILS	Annex 14 2.5.1 j)	3 m	essential	calculated	1 m or 1 ft	2/10 km (1/10 NM)
	ILS DME antenna TRSH distance		Distance	ILS DME antenna - threshold distance along centerline	ILS	Annex 14 2.5.1 j)	3 m	essential	calculated	1 m or 1 ft	as plotted
	MLS azimuth antenna rwy end distance		Distance	MLS azimuth antenna - runway/FATO end distance	MLS	Annex 14 2.5.1 j)	3 m	routine	calculated	1 m or 1 ft	as plotted
	MLS elevation antenna TRHS distance		Distance	MLS elevation antenna - threshold distance along centre line	MLS	Annex 14 2.5.1 j)	3 m	routine	calculated	1 m or 1 ft	as plotted
	MLS DME antenna TRHS distance		Distance	MLS DME/P antenna - threshold distance along centre line	MLS	Annex 14 2.5.1 j)	3 m	essential	calculated	1 m or 1 ft	as plotted
	DOC			Designated operational coverage (DOC)		Annex 15 App 1 AD 2.19 7) Annex 15 App 1 ENR 4.1					
		Range	Value	DOC range or service volume radius from the navaid / GBAS reference point	Facility coverage	Annex 15 App 1 AD 2.19 7) (AMDT 38) Annex 15 App 1 ENR 4.1					
		Height	Height	DOC height		AIXM 5.1					

Note 1)	ILS Localizer	Annex 14 App 5 Table A5-3	1 degree	essential	surveyed	1 degree
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Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
					NDB	Annex 11 App 5 Table 3	1 degree	routine	surveyed	1 degree	

Note 2)					Aerodrome e Navaid Enroute	Annex 15 App 7 Annex 15 App 7	3 m	essential	surveyed essential	1/10 degree 1 sec	as plotted
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Note 3)					DME DME/P GBAS	Annex 11 App 5 Table 2 Annex 14 Annex 15 Amdt 38	30m/100ft 3 m 1 m /1ft	essential essential essential	surveyed surveyed	30 m (100 ft) 3 m (10 ft)	30 m (100 ft)
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Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
GNSS				A worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation.							
	Name		Text	the name of the GNSS element (GPS, GBAS, GLONASS, EGNOS, MSAS, WAAS, etc.)		Annex 15 App 1 ENR 4.3					
	Frequency		Value	Frequency of the GNSS	as appropriate	Annex 15 App 1 ENR 4.3					
	Service area		Polygon	Geographical location of the GNSS service area		Annex 15 App 1 ENR 4.3					
	Coverage area		Polygon	Geographical location of the GNSS coverage area		Annex 15 App 1 ENR 4.3					
Aeronautical ground lights	Operating authority		Text	Name of the operating authority of the facility		Annex 15 App 1 ENR 4.3					
				Ground lights and other light beacons designating geographical positions which are selected by the State as being significant							
	Type		Text	Type of beacon		Annex 15 App 1 ENR 4.5					
	Designator		Text	The code assigned to uniquely identify to the beacon		Annex 15 App 1 ENR 4.5					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
	Name		Text	The name of the city or town or other identification of the beacon		Annex 15 App 1 ENR 4.5					
	Intensity		Value	Intensity of the light of the beacon		Annex 15 App 1 ENR 4.5				1000 candela	
	Characteristics		Text	Information about the characteristics of beacon		Annex 15 App 1 ENR 4.5					
	Hours of operations		Schedule	The hours of operation of the beacon		Annex 15 App 1 ENR 4.5					
	Position		Point	Geographical location of the beacon		Annex 15 App 1 ENR 4.5					
Marine lights	Position		Point	Geographical location of the beacon		Annex 4 16.9.7					
	Visibility range		Distance	The visibility range of the beacon		Annex 4 16.9.7					
	Characteristics		Text	Information about the characteristics of the beacon		Annex 4 16.9.7					
Special navigation system				Stations associated with special navigation systems (DECCA, LORAN, etc.),							
	Type		Text	Type of service available (master signal, slave signal, colour);		Annex 15 App 1 ENR 4.2					
	Designator		Text	The code assigned to uniquely identify to the special navigation system		AIXM 5.1					
	Name		Text	The textual name assigned to the special navigation system		Annex 15 App 1 ENR 4.2					
	Frequency		Value	Frequency of the special navigation system		Annex 15 App 1 ENR 4.2					
	Channel		Text	The channel number of the special navigation system		Annex 15 App 1 ENR 4.2					
	Hours of operations		Schedule	The hours of operation of the special navigation system		Annex 15 App 1 ENR 4.2					
	Position		Point	Geographical location of the special navigation system		Annex 11 App 5 Table 1 Annex 15 App 1 ENR 4.2	100m	essential	surveyed / calculated		
	Operating authority		Text	Name of the operating authority of the facility		Annex 15 App 1 ENR 4.2					
	Coverage		Text	Description of special navigation system coverage		Annex 15 App 1 ENR 4.2					

Table A1-6 Obstacle data

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.	
Obstacle	All fixed (whether temporary or permanent) and mobile obstacles or parts thereof,											
	Obstacle identifier		Text	Unique identifier of obstacle		Annex 15 App 8 Table A8-4						
	Geometry type		Code list	An indication whether the obstacle is a point, line or polygon.		Annex 15 App 8 Table A8-4						
	Horizontal position		Point Line Polygon	Horizontal position of obstacle		Annex 15 App 8 Table A8-4 Annex 14 2.5.5			See Note 1)			
	Horizontal extent		Distance	Horizontal extent of the obstacle		Annex 15 App 8 Table A8-4						
	Elevation		Elevation	Elevation of the highest point of the obstacle.		Annex 15 App 8 Table A8-4 Annex 14 2.5.5						
	Height		Height	Height of the obstacle above ground		Annex 15 App 8 Table A8-4				See Note 2)		
	Type		Text	Type of obstacle		Annex 15 Ch 10 Annex 14 2.5.5						
	Date and time stamp		Date	Date the obstacle was created		Annex 15 App 8 Table A8-4						
	Operations		Text	Feature operations of mobile obstacles		Annex 15 App 8 Table A8-4						
	Effectivity		Text	Effectivity of temporary types of obstacles		Annex 15 App 8 Table A8-4						
	Lighting											
			Type	Text	Type of lighting		Annex 15 App 8 Table A8-4 Annex 14 2.5.5					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
		Colour	Text	Colour of the obstacle lighting		Annex 15 App 8 Table A8-4					
	Marking		Text	Type of marking of obstacle		Annex 15 App 8 Table A8-4 Annex 14 2.5.5					
	Material		Text	Predominant surface material of the obstacle		AMDB					

Note 1)	Obstacles in Area 1	50 m	routine	surveyed	1 sec	as plotted
	Obstacles in Area 2	5 m	essential	surveyed	1/10 sec	1/10 sec
	Obstacles in Area 3	0.5 m	essential	surveyed	1/10 sec	1/10 sec
Note 2)	Obstacles in Area 1	30 m	routine	surveyed	1 m or 1 ft	3 m (10 ft)
	Obstacles in Area 2	3 m	essential	surveyed	1 m or 1 ft	1 m or 1 ft
	Obstacles in Area 3	0.5 m	essential	surveyed	0.1 m or 0.1 ft	1 m or 1 ft

Table A1-7 Geographic data

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Buildings				Buildings (of operational significance) and other salient/prominent (aerodrome) features		Annex 4 4.7, 5.5, 13.6, 14.6, 15.6					
	Name		Text	Name of the building		Annex 4 4.7, 5.5, 13.6, 14.6, 15.6					
	Geometry		Polygon	Geographical location of the building		Annex 4 4.7, 5.5, 13.6, 14.6, 15.6					
Aircraft movement unsuitable area				Areas unsuitable for aircraft movement		Annex 4 13.6 14.6					
	Geometry		Polygon	Depicted movement area permanently unsuitable for aircraft, clearly identified as such		Annex 4 13.6 14.6					
Built up areas				Areas covered by cities, towns and villages		Annex 4 16.7 17.7 18.6					
	Name		Text	Name of the build-up area		Annex 4 16.7 17.7 18.6					
	Geometry		Point/ Polygon	Geographical location of the build-up area		Annex 4 16.7 17.7 18.6					
Railroads				All railroads having landmark value		Annex 4 16.7 17.7 18.6					
	Name		Text	Name of the railroad		Annex 4 16.7 17.7 18.6					
	Geometry		Line	Geographical location of the railroads		Annex 4 16.7 17.7 18.6					
Highways and Roads				All highways and roads having landmark value		Annex 4 16.7 17.7 18.6					
	Name		Text	Name of highways and roads		Annex 4 16.7 17.7 18.6					
	Geometry		Line	Geographical location of highways and roads		Annex 4 16.7 17.7 18.6					

Subject	Property	Sub-Property	Type	Description	Note	Reference	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Landmarks				Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation.		Annex 4 16.7 17.7 18.6					
	Characteristics		Text	Description of the landmark		Annex 4 16.7 17.7 18.6					
	Geometry		Line	Geographical location of the railroads		Annex 4 16.7 17.7 18.6					
Political boundaries				International political boundaries							
	Geometry		Line	Geographical location of international political boundaries		Annex 4 16.7 17.7 18.6					
Hydrography				All water features comprising shore lines, lakes, rivers and streams (including those non-perennial in nature), salt lakes, glaciers and ice caps		Annex 4 4.7 7.6 8.6 9.6 10.6 11.7, 12.7 16.7 17.7 18.6 AMDB (water)					
	Name		Text	Name of the water feature		Annex 4 4.7 7.6 8.6 9.6 10.6 11.7, 12.7 16.7 17.7 18.6 AMDB (water)					
	Geometry		Line/ Polygon	Geographical location of water feature		Annex 4 4.7 7.6 8.6 9.6 10.6 11.7, 12.7 16.7 17.7 18.6 AMDB (water)					
Wooded areas				Wooded areas							
	Geometry		Polygon	Geographical location of wooded area		Annex 4 16.7 17.7 18.6					

Table A1-8. Terrain data numerical requirements

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

Table A1-9. Data types

Type (1)	Description (2)	Data elements (3)
Point	A pair of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of the point on the surface of the Earth.	Latitude Longitude Horizontal reference system Units of measurement Horizontal accuracy achieved
Line	Sequence of Points defining a linear object	Sequence of Points
Polygon	Sequence of Points forming the boundary of the polygon. The first and last Point are identical.	Closed sequence of Points
Height	The vertical distance of a level, point or an object considered as a point, measured from a specific datum.	Numerical value Vertical reference system Units of measurement Vertical accuracy achieved
Altitude	The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.	Numerical value Vertical reference system Units of measurement Vertical accuracy achieved
Elevation	The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.	Numerical value Vertical reference system Units of measurement Vertical accuracy
Distance	A linear value	Numerical value Units of measurement Accuracy achieved
Angle / Bearing	An angular value	Numerical value Units of measurement Accuracy achieved

Value	Any measured, declared or derived value not listed above.	Numerical Value Units of Measurement Accuracy achieved
Date	A calendar date referencing a particular day or month	Text
Schedule	A repetitive time period, composed of one or more intervals or special dates (e.g. holidays) occurring cyclically	Text
Code list	A set of predefined Text strings or values	Text
Text	Free text	String of characters without constraints

APPENDIX 2. INFORMATION ABOUT NATIONAL AND LOCAL REGULATION, SERVICE AND PROCEDURES

1. National Regulations and requirements

1.1 Civil aviation regulation

1.1.1.	Name, contact information and description of the civil aviation authorities concerned with the facilitation of international air navigation.
1.1.2	National regulations and international agreements / conventions ratified by the State affecting air navigation
1.1.3.	Differences between national regulations and practices of the State and related ICAO provisions, including: a) Provision concerned (Annex number, title, edition number and paragraph) b) The complete text of the difference.
1.1.4	Regulations and other requirements concerning entry, transit and departure of aircraft on international flights including: a) Regulations applicable to all types of operations b) Scheduled flight c) Non-scheduled flights d) Private flights
1.1.5	Aircraft instruments, equipment and flight documents, including: a) Instruments, equipment (including aircraft communication and navigation equipment) and flight documents to be carried on aircraft. b) Emergency locator transmitter (ELT), signalling devices and lifesaving equipment
1.1.6	Information on rules as applied within the State: a) General rules b) Visual flight rules c) Instrument flight rules
1.1.7	General conditions under which low visibility procedures applicable to Cat II/III operations at aerodromes are applied.
1.1.8	The details of aerodrome operating minima applied by the State.
1.1.9	ATS airspace classification and description
1.1.10	Conditions under which coordination between the aerodrome operator and air traffic services is effected
1.1.11	Criteria used to determine minimum flight altitudes.
1.1.12	Name, contact information and description of the authorities concerned with aircraft accident investigation.

1.1.13	Interception procedures and visual signals to be used with a clear indication of whether ICAO provisions are applied and, if not, that differences exist.
1.1.14	Procedures to be applied in case of unlawful interference.
1.1.15	Information on the traffic incidents reporting system.

1.2 Aerodrome regulation and requirements

1.2.1	Name, contact information and description of the State's designated authority responsible for aerodromes and heliports.
1.2.2	ICAO documents on which the operation of aerodromes is based.
1.2.3	General conditions under which aerodromes/heliports and associated facilities are available for use.
1.2.4	Criteria applied by the State in grouping aerodromes/heliports shall be provided for the production/distribution/provision of information purposes (e.g. international/national; primary/secondary; major/other; civil/military; etc.).
1.2.5	Regulations concerning civil use of military air bases.
1.2.6	Rules governing the establishment of rescue and firefighting services at aerodromes and heliports together with an indication of rescue and firefighting categories established by the State.
1.2.7	Information on general snow plan considerations for aerodromes/heliports available for public use at which snow conditions are normally liable to occur

1.3 Customs regulation and requirements

1.3.1.	Name, contact information and description of the customs authorities.
1.3.2	Customs regulations and requirements concerning entry, transit and departure passengers and crew.
1.3.3	Customs regulations and requirements concerning entry, transit and departure of cargo and other articles.

1.4 Immigration regulation and requirements

1.4.1.	Name, contact information and description of the immigration authorities.
1.4.2	Immigration regulations and requirements concerning entry, transit and departure passengers and crew.

1.5 Health regulation and requirements

1.5.1.	Name, contact information and description of the health authorities.
1.5.2	Regulations and requirements concerning public health measures applied to aircraft on entry, transit and departure on international flights.
1.5.3	Public health regulations and requirements concerning entry, transit and departure passengers and crew.

1.6. Agricultural quarantine regulation and requirements

1.6.1.	Name, contact information and description of the authorities concerned with agricultural quarantine.
1.6.2	Agricultural quarantine regulations and requirements concerning entry, transit and departure of cargo.

2. Information on services and procedures

2.1 Aeronautical information services

2.1.1	Name, contact information and description of aeronautical information service and charting service provided
2.1.2	Indication if service is not H24
2.1.3	ICAO documents on which the service is based.
2.1.4	Area of responsibility
2.1.5	Information on the elements of the aeronautical information products managed by the aeronautical information services including how they may be obtained.
2.1.6	Information on the AIRAC system provided including present and near future AIRAC dates.
2.1.7	Information on the pre-flight information service available at aerodromes/heliports a) Elements of the Aeronautical Information Products held; b) Maps and charts held; and c) General area of coverage of such data.
2.1.8	Information on aeronautical charts and chart series availability including: a) Title of series; b) Scale of series; c) Name and/or number of each chart or each sheet in a series; d) Information on maintenance (chart revision and amendment); e) Information on how charts may be obtained;
2.1.9	Information on availability of topographical charts

2.2 Air traffic services and procedures

2.2.1.	Name, contact information and description of air traffic service provider and ATS units
2.2.2	ICAO documents on which the service is based
2.2.3	Indication if service is not H24
2.2.4	Area of responsibility
2.2.5	Types of air traffic services provided
2.2.6	<p>Holding, approach and departure procedures:</p> <ul style="list-style-type: none"> a) Criteria on which holding, approach and departing procedures are established, b) Procedures (conventional or area navigation or both) for arriving flights which are common to flights into or within the same type of airspace c) Information if different procedures apply within a terminal airspace d) Procedures (conventional or area navigation or both) for departing flights which are common to flights departing from any aerodrome/heliport. e) Other relevant information and procedures e.g. entry procedures, final approach alignment, holding procedures and patterns.
2.2.7	<p>ATS surveillance services and procedures for:</p> <ul style="list-style-type: none"> a) Primary radar b) Secondary surveillance radar (SSR) c) Automatic dependent surveillance – broadcast (ADS-B) d) Other relevant information and procedures, e.g. radar failure procedures and transponder failure procedures
2.2.8	Altimeter setting procedures
2.2.9	Regional supplementary procedures (SUPPs) affecting the entire area of responsibility.
2.2.10	Information on air traffic flow management (ATFM) system and airspace management
2.2.11	<p>Flight planning</p> <ul style="list-style-type: none"> a) Restriction, limitation or advisory information related to the flight planning stage which may assist the user in the presentation of the intended flight operation b) Information on addressing of flight plans
2.2.12	Information on the type of air navigation service charges including methods of payment and exemptions/reductions where applicable.

2.3 Communication services

2.3.1.	Name, contact information and description of service provider of
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	telecommunication and navigation facilities
2.3.2	ICAO documents on which the service is based
2.3.3	Indication if service is not H24.
2.3.4	Area of responsibility
2.3.5	Information on types of services and facilities provided and an indication where detailed information can be obtained.
2.3.6	Information on requirements and conditions under which the communication service is available.

2.4 Meteorological services

2.4.1	Name, contact information and description of the authorities concerned with meteorology and of the meteorological service.
2.4.2.	ICAO documents on which the service is based.
2.4.3	Indication if service is not H24
2.4.4	Area of responsibility
2.4.5	Information on meteorological observations and reports provided for international air navigation a) Name of the station and the ICAO location indicator;" b) Type and frequency of observation including an indication of automatic observing equipment; c) Types of meteorological reports (e.g. METAR) and availability of a trend forecast; d) specific type of observation system and number of observation sites used to observe and report surface wind, visibility, runway visual range, cloud base, temperature and, where applicable, wind shear (e.g. anemometer at intersection of runways, transmissometer next to touchdown zone, etc.); e) Hours of operation; and f) Indication of aeronautical climatological information available.
2.4.6	Information on the main type of service provided
2.4.7	Minimum amount of advance notice required by the meteorological authority from operators in respect of briefing, consultation and flight documentation and other meteorological information they require or change.
2.4.8	Requirements of the meteorological authority for the making and transmission of aircraft reports
2.4.9	Information on VOLMET and/or D-VOLMET service, including:

	<ul style="list-style-type: none"> a) Name of transmitting station;" b) call sign or identification and abbreviation for the radio communication emission; c) Frequency or frequencies used for broadcast; d) Broadcasting period; e) Hours of service; f) list of aerodromes/heliports for which reports and/or forecasts are included; and g) Reports, forecasts and SIGMET information included.
2.4.10	<p>SIGMET and AIRMET service: Information on Meteorological watch provided within flight information regions or control areas for which air traffic services are provided, including a list of the meteorological watch offices with:</p> <ul style="list-style-type: none"> a) Name of the meteorological watch office, ICAO location indicator;" b) Hours of service; c) Flight information region(s) or control area(s) served; d) SIGMET validity periods; e) Specific procedures applied to SIGMET information (e.g. for volcanic ash and tropical cyclones); f) Procedures applied to AIRMET information (in accordance with relevant regional air navigation agreements); g) The air traffic services unit(s) provided with SIGMET and AIRMET
2.4.11	Information on other available automated services for the provision of meteorological information.

2.5 Services, procedures and local regulations on aerodromes and heliports

2.5.1	<p>Information on aerodrome operator including:</p> <ul style="list-style-type: none"> a) Name and contact information b) Operational hours
2.5.2	Information on local regulations applicable to the traffic at use of the aerodrome including the acceptability of training flights, non-radio and micro light aircraft and similar, and to ground manoeuvring and parking.
2.5.3	Information on the type of aerodrome/heliport charges including methods of payment and exemptions/reductions where applicable.
2.5.4	Information on noise abatement procedures established at the aerodrome.
2.5.5	Information on the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organization at the aerodrome.
2.5.6	<p>Information on low visibility procedures</p> <ul style="list-style-type: none"> a) Runway(s) and associated equipment authorized for use under low visibility procedures; b) Information on meteorological conditions under which initiation, use and termination of low visibility procedures would be made. c) Description of ground marking/lighting for use under low visibility procedures

2.5.7	Information on bird concentrations at the aerodrome, together with an indication of significant daily movement between resting and feeding areas.
2.5.8	Information on runway friction measuring devices and runway friction level minima.
2.5.9	Information on the equipment and operational priorities established for the clearance of aerodrome movement areas including type(s) of clearing equipment and clearance priorities
2.5.10	Information on the rescue and firefighting services and equipment available at the aerodrome, including: a) aerodrome category for firefighting; b) rescue equipment; c) capability for removal of disabled aircraft
2.5.11	Information on passenger facilities available at the aerodrome/heliport at or in the vicinity of aerodrome or a reference to other information sources such as a website: a) hotels b) restaurants c) transportation d) medical facilities e) bank and post office f) tourist office
2.5.12	Information on handling services and facilities available at the aerodrome/heliport including: a) cargo-handling facilities b) fuel and oil types c) fuelling facilities and capacity and hours of service; d) de-icing facilities and hours of service e) hangar space for visiting aircraft f) repair facilities for visiting aircraft
2.5.13	Information on hours of operation of AIS briefing office
2.5.14	Information on hours of operation of ATS reporting office (ARO)
2.5.15	Information on hours of operation of MET briefing office
2.5.16	Information on hours of operation of air traffic service
2.5.17	Information on hours of operation of customs and immigration
2.5.18	Information on hours of operation of health and sanitation
2.5.19	Information on hours of operation of security

2.6.1	Name, contact information and description of the authorities responsible for search and rescue.
2.6.2	ICAO documents on which the service is based.
2.6.3	Area of responsibility
2.6.4	Types of services
2.6.5	Information on SAR agreements
2.6.6	Brief description on provisions for SAR including general conditions under which the service and facilities are available for international use, including an indication of whether a facility available for search and rescue is specialized in SAR techniques and functions, or is specially used for other purposes but adapted for SAR purposes by training and equipment, or is only occasionally available and has no particular training or preparation for SAR work.
2.6.7	Procedures and signals employed by rescue aircraft and also the signals to be used by survivors.

APPENDIX 3. CONTENTS OF THE AERONAUTICAL INFORMATION PUBLICATION (AIP)

Note: the information elements prefixed with “#AIP-DS#” may be left out when available through the AIP data set (as specified in Chapter 5, 5.2.1.1.3).

Note: the information elements prefixed with “#OBS-DS#” may be left out when available through the Obstacle data set (as specified in Chapter 5, 5.3.2.3.2).

PART 1 — GENERAL (GEN)

When the AIP is produced as one volume, the preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments appear only in Part 1 — GEN, and the annotation “not applicable” must be entered against each of these subsections in Parts 2 and 3.

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

GEN 0.1 Preface

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

- 1) name of the publishing authority;
- 2) applicable ICAO documents;
- 3) publication media (i.e. printed, online or other electronic media);
- 4) the AIP structure and established regular amendment interval;
- 5) copyright policy, if applicable; and
- 6) service to contact in case of detected AIP errors or omissions.

GEN 0.2 Record of AIP Amendments

A record of AIP Amendments and AIRAC AIP Amendments (published in accordance with the AIRAC system) containing:

- 1) amendment number;
- 2) publication date;
- 3) date inserted (for the AIRAC AIP Amendments, effective date); and
- 4) initials of officer who inserted the amendment.

GEN 0.3 Record of AIP Supplements

A record of issued AIP Supplements containing:

- 1) Supplement number;
- 2) Supplement subject;
- 3) AIP section(s) affected;
- 4) period of validity; and
- 5) cancellation record.

GEN 0.4 Checklist of AIP pages

A checklist of AIP pages containing:

- 1) page number/chart title; and
- 2) publication or effective date (day, month by name and year) of the aeronautical information.

GEN 0.5 List of hand amendments to the AIP

A list of current hand amendments to the AIP containing:

- 1) AIP page(s) affected;

- 2) amendment text; and
- 3) AIP Amendment number by which a hand amendment was introduced.

GEN 0.6 Table of contents to Part 1

A list of sections and subsections contained in Part 1 — General (GEN).

Note.— Subsections may be listed alphabetically.

GEN 1. NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 Designated authorities

The addresses of designated authorities concerned with the facilitation of international air navigation (civil aviation, meteorology, customs, immigration, health, en-route and aerodrome/heliport charges, agricultural quarantine and aircraft accident investigation) containing, for each authority:

- 1) designated authority;
- 2) name of the authority;
- 3) postal address;
- 4) telephone number;
- 5) telefax number;
- 6) e-mail address;
- 7) aeronautical fixed service (AFS) address; and
- 8) website address, if available.

GEN 1.2 Entry, transit and departure of aircraft

Regulations and requirements for advance notification and applications for permission concerning entry, transit and departure of aircraft on international flights.

GEN 1.3 Entry, transit and departure of passengers and crew

Regulations (including customs, immigration and quarantine, and requirements for advance notification and applications for permission) concerning entry, transit and departure of non-immigrant passengers and crew.

GEN 1.4 Entry, transit and departure of cargo

Regulations (including customs, and requirements for advance notification and applications for permission) concerning entry, transit and departure of cargo.

Note.— Provisions for facilitating entry and departure for search, rescue, salvage, investigation, repair or salvage in connection with lost or damaged aircraft are detailed in section GEN 3.6, Search and rescue.

GEN 1.5 Aircraft instruments, equipment and flight documents

Brief description of aircraft instruments, equipment and flight documents, including:

- 1) instruments, equipment (including aircraft communication, navigation and surveillance equipment) and flight documents to be carried on aircraft, including any special requirement in addition to the provisions specified in Annex 6, Part I, Chapters 6 and 7; and
- 2) emergency locator transmitter (ELT), signalling devices and life-saving equipment as presented in Annex 6, Part I, 6.6 and Part II, 2.4.5, where so determined by regional air navigation meetings, for flights over designated land areas.

GEN 1.6 Summary of national regulations and international agreements/conventions

A list of titles and references and, where applicable, summaries of national regulations affecting air

navigation, together with a list of international agreements/conventions ratified by State.

GEN 1.7 Differences from ICAO Standards, Recommended Practices and Procedures

A list of significant differences between national regulations and practices of the State and related ICAO provisions, including:

- 1) provision affected (Annex and edition number, paragraph); and
- 2) difference in full text.

All significant differences must be listed under this subsection. All Annexes must be listed in numerical order even if there is no difference to an Annex, in which case a NIL notification must be provided. National differences or the degree of non- application of the regional supplementary procedures (SUPPs) must be notified immediately following the Annex to which the supplementary procedure relates.

GEN 2. TABLES AND CODES

GEN 2.1 Measuring system, aircraft markings, holidays

GEN 2.1.1 Units of measurement

Description of units of measurement used including table of units of measurement.

GEN 2.1.2 Temporal reference system

Description of the temporal reference system (calendar and time system) employed, together with an indication of whether or not daylight saving hours are employed and how the temporal reference system is presented throughout the AIP.

GEN 2.1.3 Horizontal reference system

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

- 1) name/designation of the reference system;
- 2) identification and parameters of the projection;
- 3) identification of the ellipsoid used;
- 4) identification of the datum used;
- 5) area(s) of application; and
- 6) an explanation, if applicable, of the asterisk used to identify those coordinates that do not meet Annex 11 and 14 accuracy requirements.

GEN 2.1.4 Vertical reference system

Brief description of the vertical reference system used, including:

- 1) name/designation of the reference system;
- 2) description of the geoid model used including the parameters required for height transformation between the model used and EGM-96; and
- 3) an explanation, if applicable, of the asterisk used to identify those elevations/geoid undulations that do not meet Annex 14 accuracy requirements.

GEN 2.1.5 Aircraft nationality and registration marks

Indication of aircraft nationality and registration marks adopted by the State.

GEN 2.1.6 Public holidays

A list of public holidays with indication of services being affected.

GEN 2.2 Abbreviations used in AIS publications

A list of alphabetically arranged abbreviations and their respective significations used by the State in

its AIP and in the distribution of aeronautical data and aeronautical information with appropriate annotation for those national abbreviations that are different from those contained in the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400).

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

GEN 2.3 Chart symbols

A list of chart symbols arranged according to the chart series where symbols are applied.

GEN 2.4 Location indicators

A list of alphabetically arranged location indicators assigned to the locations of aeronautical fixed stations to be used for encoding and decoding purposes. An annotation to locations not connected to the aeronautical fixed service (AFS) must be provided.

GEN 2.5 List of radio navigation aids

A list of radio navigation aids arranged alphabetically, containing:

- 1) identifier;
- 2) name of the station;
- 3) type of facility/aid; and
- 4) indication whether aid serves en-route (E), aerodrome (A) or dual (AE) purposes.

GEN 2.6 Conversion of units of measurement

Tables for conversion or, alternatively, conversion formulae between:

- 1) nautical miles and kilometres and vice versa;
- 2) feet and metres and vice versa;
- 3) decimal minutes of arc and seconds of arc and vice versa; and
- 4) other conversions as appropriate.

GEN 2.7 Sunrise/sunset

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

- 1) station name;
- 2) ICAO location indicator;
- 3) geographical coordinates in degrees and minutes;
- 4) date(s) for which times are given;
- 5) time for the beginning of morning civil twilight;
- 6) time for sunrise;
- 7) time for sunset; and
- 8) time for the end of evening civil twilight.

GEN 3. SERVICES

GEN 3.1 Aeronautical information services

GEN 3.1.1 Responsible service

Description of the Aeronautical Information Service (AIS) provided and its major components, including:

- 1) service/unit name;

- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.1.2 Area of responsibility

The area of responsibility for the aeronautical information service.

GEN 3.1.3 Aeronautical publications

Description of the elements of the ~~aeronautical information products~~ ~~Integrated Aeronautical Information Package~~, including:

- 1) AIP and related amendment service;
- 2) AIP Supplements;
- 3) AIC;
- 4) NOTAM and pre-flight information bulletins (PIB);
- 5) checklists and lists of valid NOTAM; and
- 6) how they may be obtained.

When an AIC is used to promulgate publication prices, that must be indicated in this section of the AIP.

GEN 3.1.4 AIRAC system

Brief description of the AIRAC system provided including a table of present and near future AIRAC dates.

GEN 3.1.5 Pre-flight information service at aerodromes/heliports

A list of aerodromes/heliports at which pre-flight information is routinely available, including an indication of relevant:

- 1) elements of the ~~aeronautical information products~~ ~~Integrated Aeronautical Information Packages~~ held;
- 2) maps and charts held; and
- 3) general area of coverage of such data.

GEN 3.1.6 ~~Digital data sets~~ ~~Electronic terrain and obstacle data~~

Details of how ~~electronic~~ terrain and obstacle data ~~sets~~ may be obtained, containing:

- 1) name of the individual, service or organization responsible;
- 2) street address and e-mail address of the individual, service or organization responsible;
- 3) telefax number of the individual, service or organization responsible;
- 4) contact telephone number of the individual, service or organization responsible;
- 5) hours of service (time period including time zone when contact can be made);
- 6) online information that can be used to contact the individual, service or organization; and
- 7) supplemental information, if necessary, on how and when to contact the individual, service or organization.

GEN 3.2 Aeronautical charts

GEN 3.2.1 Responsible service(s)

Description of service(s) responsible for the production of aeronautical charts, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.2.2 Maintenance of charts

Brief description of how aeronautical charts are revised and amended.

GEN 3.2.3 Purchase arrangements

Details of how charts may be obtained, containing:

- 1) service/sales agency(ies);
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address; and
- 7) website address, if available.

GEN 3.2.4 Aeronautical chart series available

A list of aeronautical chart series available followed by a general description of each series and an indication of the intended use.

GEN 3.2.5 List of aeronautical charts available

A list of aeronautical charts available, including:

- 1) title of series;
- 2) scale of series;
- 3) name and/or number of each chart or each sheet in a series;
- 4) price per sheet; and
- 5) date of latest revision.

GEN 3.2.6 Index to the World Aeronautical Chart (WAC) — ICAO 1:1 000 000

An index chart showing coverage and sheet layout for the WAC 1:1 000 000 produced by a State. If Aeronautical Chart — ICAO 1:500 000 is produced instead of WAC 1:1 000 000, index charts must be used to indicate coverage and sheet layout for the Aeronautical Chart — ICAO 1:500 000.

GEN 3.2.7 Topographical charts

Details of how topographical charts may be obtained, containing:

- 1) name of service/agency(ies);
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;

- 6) AFS address; and
- 7) website address, if available.

GEN 3.2.8 Corrections to charts not contained in the AIP

A list of corrections to aeronautical charts not contained in the AIP, or an indication where such information can be obtained.

GEN 3.3 Air traffic services

GEN 3.3.1 Responsible service

Description of the air traffic service and its major components, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.3.2 Area of responsibility

Brief description of area of responsibility for which air traffic services are provided.

GEN 3.3.3 Types of services

Brief description of main types of air traffic services provided.

GEN 3.3.4 Coordination between the operator and ATS

General conditions under which coordination between the operator and air traffic services is effected.

GEN 3.3.5 Minimum flight altitude

The criteria used to determine minimum flight altitudes.

GEN 3.3.6 ATS units address list

A list of ATS units and their addresses arranged alphabetically, containing:

- 1) unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address; and
- 7) website address, if available.

GEN 3.4 Communication services

GEN 3.4.1 Responsible service

Description of the service responsible for the provision of telecommunication and navigation facilities, including:

- 1) service name;

- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.4.2 Area of responsibility

Brief description of area of responsibility for which telecommunication service is provided.

GEN 3.4.3 Types of service

Brief description of the main types of service and facilities provided, including:

- 1) radio navigation services;
- 2) voice and/or data link services;
- 3) broadcasting service;
- 4) language(s) used; and
- 5) an indication of where detailed information can be obtained.

GEN 3.4.4 Requirements and conditions

Brief description concerning the requirements and conditions under which the communication service is available.

GEN 3.4.5 Miscellaneous

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

GEN 3.5 Meteorological services

GEN 3.5.1 Responsible service

Brief description of the meteorological service responsible for the provision of meteorological information, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.5.2 Area of responsibility

Brief description of area and/or air routes for which meteorological service is provided.

GEN 3.5.3 Meteorological observations and reports

Detailed description of the meteorological observations and reports provided for international

air navigation, including:

- 1) name of the station and the ICAO location indicator;
- 2) type and frequency of observation including an indication of automatic observing equipment;
- 3) types of meteorological reports (e.g. METAR) and availability of a trend forecast;
- 4) specific type of observation system and number of observation sites used to observe and report surface wind, visibility, runway visual range, cloud base, temperature and, where applicable, wind shear (e.g. anemometer at intersection of runways, transmissometer next to touchdown zone, etc.);
- 5) hours of operation; and
- 6) indication of aeronautical climatological information available.

GEN 3.5.4 Types of services

Brief description of the main types of service provided, including details of briefing, consultation, display of meteorological information, flight documentation available for operators and flight crew members, and of the methods and means used for supplying the meteorological information.

GEN 3.5.5 Notification required from operators

Minimum amount of advance notice required by the meteorological authority from operators in respect of briefing, consultation and flight documentation and other meteorological information they require or change.

GEN 3.5.6 Aircraft reports

As necessary, requirements of the meteorological authority for the making and transmission of aircraft reports.

GEN 3.5.7 VOLMET service

Description of VOLMET and/or D-VOLMET service, including:

- 1) name of transmitting station;
- 2) call sign or identification and abbreviation for the radio communication emission;
- 3) frequency or frequencies used for broadcast;
- 4) broadcasting period;
- 5) hours of service;
- 6) list of aerodromes/heliports for which reports and/or forecasts are included; and
- 7) reports, forecasts and SIGMET information included and remarks.

GEN 3.5.8 SIGMET and AIRMET service

Description of the meteorological watch provided within flight information regions or control areas for which air traffic services are provided, including a list of the meteorological watch offices with:

- 1) name of the meteorological watch office, ICAO location indicator;

- 2) hours of service;
- 3) flight information region(s) or control area(s) served;
- 4) SIGMET validity periods;
- 5) specific procedures applied to SIGMET information (e.g. for volcanic ash and tropical cyclones);
- 6) procedures applied to AIRMET information (in accordance with relevant regional air navigation agreements);
- 7) the air traffic services unit(s) provided with SIGMET and AIRMET information; and
- 8) additional information (e.g. concerning any limitation of service, etc.).

GEN 3.5.9 Other automated meteorological services

Description of available automated services for the provision of meteorological information (e.g. automated pre-flight information service accessible by telephone and/or computer modem) including:

- 1) service name;
- 2) information available;
- 3) areas, routes and aerodromes covered; and
- 4) telephone and telefax number(s), e-mail address, and, if available, website address.

GEN 3.6 Search and rescue

GEN 3.6.1 Responsible service(s)

Brief description of service(s) responsible for the provision of search and rescue (SAR), including:

- 1) service/unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available; and
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

GEN 3.6.2 Area of responsibility

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

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

GEN 3.6.3 Types of service

Brief description and geographical portrayal, where appropriate, of the type of service and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft.

GEN 3.6.4 SAR agreements

Brief description of SAR agreements in force, including provisions for facilitating entry and departure of other States' aircraft for search, rescue, salvage, repair or salvage in connection with lost or damaged aircraft, either with airborne notification only or after flight plan notification.

GEN 3.6.5 Conditions of availability

Brief description of provisions for search and rescue, including the general conditions under which the service and facilities are available for international use, including an indication of whether a facility available for search and rescue is specialized in SAR techniques and functions, or is specially used for other purposes but adapted for SAR purposes by training and equipment, or is only occasionally available and has no particular training or preparation for SAR work.

GEN 3.6.6 Procedures and signals used

Brief description of the procedures and signals employed by rescue aircraft and a table showing the signals to be used by survivors.

GEN 4. CHARGES FOR AERODROMES/HELIPORTS AND AIR NAVIGATION SERVICES

Reference may be made to where details of actual charges may be found, if not itemized in this chapter.

GEN 4.1 Aerodrome/heliport charges

Brief description of type of charges which may be applicable at aerodromes/heliports available for international use, including:

- 1) landing of aircraft;
- 2) parking, hangarage and long-term storage of aircraft;
- 3) passenger service;
- 4) security;
- 5) noise-related items;
- 6) other (customs, health, immigration, etc.);
- 7) exemptions/reductions; and
- 8) methods of payment.

GEN 4.2 Air navigation services charges

Brief description of charges which may be applicable to air navigation services provided for international use, including:

- 1) approach control;
- 2) route air navigation services;
- 3) cost basis for air navigation services and exemptions/reductions; and
- 4) methods of payment.

PART 2 — EN-ROUTE (ENR)

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

ENR 0.6 Table of contents to Part 2

A list of sections and subsections contained in Part 2 — En-route.

Note.— Subsections may be listed alphabetically.

ENR 1. GENERAL RULES AND PROCEDURES

ENR 1.1 General rules

The requirement is for publication of the general rules as applied within the State.

ENR 1.2 Visual flight rules

The requirement is for publication of the visual flight rules as applied within the State.

ENR 1.3 Instrument flight rules

The requirement is for publication of the instrument flight rules as applied within the State.

ENR 1.4 ATS airspace classification and description

ENR 1.4.1 ATS airspace classification

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

ENR 1.4.2 ATS airspace description

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

ENR 1.5 Holding, approach and departure procedures

ENR 1.5.1 General

The requirement is for a statement concerning the criteria on which holding, approach and departure procedures are established. If different from ICAO provisions, the requirement is for presentation of criteria used in a tabular form.

ENR 1.5.2 Arriving flights

The requirement is to present procedures (conventional or area navigation or both) for arriving flights which are common to flights into or within the same type of airspace. If different procedures apply within a terminal airspace, a note to this effect must be given together with a reference to where the specific procedures can be found.

ENR 1.5.3 Departing flights

The requirement is to present procedures (conventional or area navigation or both) for departing flights which are common to flights departing from any aerodrome/heliport.

ENR 1.5.4 Other relevant information and procedures

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

ENR 1.6 ATS surveillance services and procedures

ENR 1.6.1 Primary radar

Description of primary radar services and procedures, including:

- 1) supplementary services;
- 2) the application of radar control service;
- 3) radar and air-ground communication failure procedures;
- 4) voice and CPDLC position reporting requirements; and
- 5) graphic portrayal of area of radar coverage.

ENR 1.6.2 Secondary surveillance radar (SSR)

Description of secondary surveillance radar (SSR) operating procedures, including:

- 1) emergency procedures;
- 2) air-ground communication failure and unlawful interference procedures;
- 3) the system of SSR code assignment;
- 4) voice and CPDLC position reporting requirements; and

- 5) graphic portrayal of area of SSR coverage.

Note.— The SSR description is of particular importance in areas or routes where the possibility of interception exists.

ENR 1.6.3 Automatic dependent surveillance — broadcast (ADS-B)

Description of automatic dependent surveillance — broadcast (ADS-B) operating procedures, including:

- 1) emergency procedures;
- 2) air-ground communication failure and unlawful interference procedures;
- 3) aircraft identification requirements;
- 4) voice and CPDLC position reporting requirements; and
- 5) graphic portrayal of area of ADS-B coverage.

Note.— The ADS-B description is of particular importance in areas or routes where the possibility of interception exists.

ENR 1.6.4 Other relevant information and procedures

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

ENR 1.7 Altimeter setting procedures

The requirement is for a statement of altimeter setting procedures in use, containing:

- 1) brief introduction with a statement concerning the ICAO documents on which the procedures are based together with differences to ICAO provisions, if any;
- 2) basic altimeter setting procedures;
- 3) description of altimeter setting region(s);
- 4) procedures applicable to operators (including pilots); and
- 5) table of cruising levels.

ENR 1.8 Regional supplementary procedures

The requirement is for presentation of regional supplementary procedures (SUPPs) affecting the entire area of responsibility.

ENR 1.9 Air traffic flow management and airspace management

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

- 1) ATFM structure, service area, service provided, location of unit(s) and hours of operation;
- 2) types of flow messages and descriptions of the formats; and
- 3) procedures applicable for departing flights, containing:
 - a) service responsible for provision of information on applied ATFM measures;
 - b) flight plan requirements; and
 - c) slot allocations.

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

ENR 1.10 Flight planning

The requirement is to indicate any restriction, limitation or advisory information related to the flight planning stage which may assist the user in the presentation of the intended flight operation, including:

- 1) procedures for the submission of a flight plan;
- 2) repetitive flight plan system; and
- 3) changes to the submitted flight plan.

ENR 1.11 Addressing of flight plan messages

The requirement is for an indication, in tabular form, of the addresses allocated to flight plans, showing:

- 1) category of flight (IFR, VFR or both);
- 2) route (into or via FIR and/or TMA); and
- 3) message address.

ENR 1.12 Interception of civil aircraft

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

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

ENR 1.13 Unlawful interference

The requirement is for presentation of appropriate procedures to be applied in case of unlawful

interference.

ENR 1.14 Air traffic incidents

Description of air traffic incidents reporting system, including:

- 1) definition of air traffic incidents;
- 2) use of the “Air Traffic Incident Reporting Form”;
- 3) reporting procedures (including in-flight procedures); and
- 4) purpose of reporting and handling of the form.

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

ENR 2. AIR TRAFFIC SERVICES AIRSPACE

ENR 2.1 FIR, UIR, TMA AND CTA

#AIP-DS# Detailed description of flight information regions (FIR), upper flight information regions (UIR), and control areas (CTA) (including specific CTA such as TMA), including:

- 1) name, geographical coordinates in degrees and minutes of the FIR/UIR lateral limits and in degrees, minutes and seconds of the CTA lateral limits, vertical limits and class of airspace;
- 2) identification of unit providing the service;
- 3) call sign of aeronautical station serving the unit and language(s) used, specifying the area and conditions, when and where to be used, if applicable;
- 4) frequencies supplemented by indications for specific purposes; and
- 5) remarks.

#AIP-DS# Control zones around military air bases not otherwise described in the AIP must be included in this subsection.

Where the requirements of Annex 2 concerning flight plans, two-way communications and position reporting apply to all flights in order to eliminate or reduce the need for interceptions and/or where the possibility of interception exists and the maintenance of guard on the VHF emergency channel 121.5 MHz is required, a statement to this effect must be included for the relevant area(s) or portion(s) thereof.

A description of designated areas over which the carriage of an emergency locator transmitter (ELT) is required and where aircraft shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

Note.— Other types of airspace around civil aerodromes/heliports such as control zones and aerodrome traffic zones are described in the relevant aerodrome or heliport section.

ENR 2.2 Other regulated airspace

Where established, a detailed description of other types of regulated airspace and airspace classification.

ENR 3. ATS ROUTES

Note 1.— Bearings, tracks and radials are normally magnetic. In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, may be used.

Note 2.— Changeover points established at the midpoint between two radio navigation aids, or at the intersection of the two radials in the case of a route which changes direction between the navigation aids, need not be shown for each route segment if a general statement regarding their existence is made.

ENR 3.1 Lower ATS routes

#AIP-DS# Detailed description of lower ATS routes, including:

- 1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits or minimum en-route altitudes, to the nearest higher 50 m or 100 ft, and airspace classification;
- 4) lateral limits and minimum obstacle clearance altitudes;
- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations.

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

ENR 3.2 Upper ATS routes

#AIP-DS# Detailed description of upper ATS routes, including:

- 1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits and airspace classification;
- 4) lateral limits;

- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations.

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

ENR 3.3 Area navigation routes

#AIP-DS# Detailed description of area navigation (RNAV) routes, including:

- 1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) in respect of waypoints defining an area navigation route, additionally as applicable:
 - a) station identification of the reference VOR/DME;
 - b) bearing to the nearest degree and the distance to the nearest tenth of a kilometre or tenth of a nautical mile from the reference VOR/DME, if the waypoint is not collocated with it; and
 - c) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft);
- 3) geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between defined end-points and distance between each successive designated significant point;
- 4) upper and lower limits and airspace classification;
- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, and any navigation specification(s) limitations.

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

ENR 3.4 Helicopter routes

#AIP-DS# Detailed description of helicopter routes, including:

- 1) route designator, designation of the navigation specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;

- 3) upper and lower limits and airspace classification;
- 4) minimum flight altitudes to the nearest higher 50 m or 100 ft;
- 5) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 6) remarks, including an indication of the controlling unit and its operating frequency, and any navigation specification(s) limitations.

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

ENR 3.5 Other routes

#AIP-DS# The requirement is to describe other specifically designated routes which are compulsory within specified area(s).

Note.— Arrival, transit and departure routes which are specified in connection with procedures for traffic to and from aerodromes/heliports need not be described since they are described in the relevant section of Part 3 — Aerodromes.

ENR 3.6 En-route holding

#AIP-DS# The requirement is for a detailed description of en-route holding procedures, containing:

- 1) holding identification (if any) and holding fix (navigation aid) or waypoint with geographical coordinates in degrees, minutes and seconds;
- 2) inbound track;
- 3) direction of the procedure turn;
- 4) maximum indicated airspeed;
- 5) minimum and maximum holding level;
- 6) time/distance outbound; and
- 7) indication of the controlling unit and its operating frequency.

Note.— Obstacle clearance criteria related to holding procedures are contained in Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volumes I and II.

ENR 4. RADIO NAVIGATION AIDS/SYSTEMS

ENR 4.1 Radio navigation aids — en-route

#AIP-DS# A list of stations providing radio navigation services established for en-route purposes and arranged alphabetically by name of the station, including:

- 1) name of the station and magnetic variation to the nearest degree and for VOR, station declination to the nearest degree used for technical line-up of the aid;
- 2) identification;
- 3) frequency/channel for each element;
- 4) hours of operation;
- 5) geographical coordinates in degrees, minutes and seconds of the position of the transmitting antenna;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft); and
- 7) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority must be indicated in the remarks column. Facility coverage must be indicated in the remarks column.

ENR 4.2 Special navigation systems

Description of stations associated with special navigation systems (DECCA, LORAN, etc.), including:

- 1) name of station or chain;
- 2) type of service available (master signal, slave signal, colour);
- 3) frequency (channel number, basic pulse rate, recurrence rate, as applicable);
- 4) hours of operation;
- 5) geographical coordinates in degrees, minutes and seconds of the position of the transmitting station; and
- 6) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority must be indicated in the remarks column. Facility coverage must be indicated in the remarks column.

ENR 4.3 Global navigation satellite system (GNSS)

A list and description of elements of the global navigation satellite system (GNSS) providing the navigation service established for en-route purposes and arranged alphabetically by name of the element, including:

- 1) the name of the GNSS element (GPS, GLONASS, EGNOS, MSAS, WAAS, etc.);
- 2) frequency(ies), as appropriate;
- 3) geographical coordinates in degrees, minutes and seconds of the nominal service area and coverage area; and

4) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority must be indicated in the remarks column.

ENR 4.4 Name-code designators for significant points

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

- 1) name-code designator;
- 2) geographical coordinates in degrees, minutes and seconds of the position;
- 3) reference to ATS or other routes where the point is located; and
- 4) remarks, including supplementary definition of positions where required.

ENR 4.5 Aeronautical ground lights — en-route

#AIP-DS# A list of aeronautical ground lights and other light beacons designating geographical positions which are selected by the State as being significant, including:

- 1) name of the city or town or other identification of the beacon;
- 2) type of beacon and intensity of the light in thousands of candelas;
- 3) characteristics of the signal;
- 4) operational hours; and
- 5) remarks.

ENR 5. NAVIGATION WARNINGS

ENR 5.1 Prohibited, restricted and danger areas

#AIP-DS# Description, supplemented by graphic portrayal where appropriate, of prohibited, restricted and danger areas together with information regarding their establishment and activation, including:

- 1) identification, name and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) upper and lower limits; and
- 3) remarks, including time of activity.

Type of restriction or nature of hazard and risk of interception in the event of penetration must be indicated in the remarks column.

ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ)

#AIP-DS# Description, supplemented by graphic portrayal where appropriate, of established

military training areas and military exercises taking place at regular intervals, and established air defence identification zone (ADIZ), including:

- 1) geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) upper and lower limits and system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures; and
- 3) remarks, including time of activity and risk of interception in the event of penetration of ADIZ.

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

ENR 5.3.1 Other activities of a dangerous nature

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

- 1) geographical coordinates in degrees and minutes of centre of area and range of influence;
- 2) vertical limits;
- 3) advisory measures;
- 4) authority responsible for the provision of information; and
- 5) remarks, including time of activity.

ENR 5.3.2 Other potential hazards

Description, supplemented by charts where appropriate, of other potential hazards that could affect flights (e.g. active volcanoes, nuclear power stations, etc.) including:

- 1) geographical coordinates in degrees and minutes of location of potential hazard;
- 2) vertical limits;
- 3) advisory measures;
- 4) authority responsible for the provision of information; and
- 5) remarks.

ENR 5.4 Air navigation obstacles

#OBS-DS# The list of obstacles affecting air navigation in Area 1 (the entire State territory), including:

- 1) obstacle identification or designation;
- 2) type of obstacle;
- 3) obstacle position, represented by geographical coordinates in degrees, minutes and seconds;
- 4) obstacle elevation and height to the nearest metre or foot;

- 5) type and colour of obstacle lighting (if any); and
- 6) if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6.

Note 1.— An obstacle whose height above the ground is 100 m and higher is considered an obstacle for Area 1.

Note 2.— Specifications governing the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations/heights for obstacles in Area 1 are given in Annex 11, Appendix 5, Tables 1 and 2, respectively.

ENR 5.5 Aerial sporting and recreational activities

#AIP-DS# Brief description, supplemented by graphic portrayal where appropriate, of intensive aerial sporting and recreational activities together with conditions under which they are carried out, including:

- 1) designation and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) vertical limits;
- 3) operator/user telephone number; and
- 4) remarks, including time of activity.

Note.— This paragraph may be subdivided into different sections for each different category of activity, giving the indicated details in each case.

ENR 5.6 Bird migration and areas with sensitive fauna

Description, supplemented by charts where practicable, of movements of birds associated with migration, including migration routes and permanent resting areas and areas with sensitive fauna.

ENR 6. EN-ROUTE CHARTS

The requirement is for the En-route Chart — ICAO and index charts to be included in this section.

PART 3 — AERODROMES (AD)

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

AD 0.6 Table of contents to Part 3

A list of sections and subsections contained in Part 3 — Aerodromes (AD).

Note.— Subsections may be listed alphabetically.

AD 1. AERODROMES/HELIPORTS — INTRODUCTION

AD 1.1 Aerodrome/heliport availability and conditions of use

AD 1.1.1 General conditions

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

- 1) the general conditions under which aerodromes/heliports and associated facilities are available for use; and
- 2) a statement concerning the ICAO documents on which the services are based and a reference to the AIP location where differences, if any, are listed.

AD 1.1.2 Use of military air bases

Regulations and procedures, if any, concerning civil use of military air bases.

AD 1.1.3 Low visibility procedures (LVP)

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

AD 1.1.4 Aerodrome operating minima

Details of aerodrome operating minima applied by the State.

AD 1.1.5 Other information

If applicable, other information of a similar nature.

AD 1.2 Rescue and firefighting services and snow plan

AD 1.2.1 Rescue and firefighting services

Brief description of rules governing the establishment of rescue and firefighting services at aerodromes and heliports available for public use together with an indication of rescue and firefighting categories established by a State.

AD 1.2.2 Snow plan

Brief description of general snow plan considerations for aerodromes/heliports available for public use at which snow conditions are normally liable to occur, including:

- 1) organization of the winter service;
- 2) surveillance of movement areas;
- 3) measuring methods and measurements taken;
- 4) actions taken to maintain the usability of movement areas;
- 5) system and means of reporting;
- 6) the cases of runway closure; and
- 7) distribution of information about snow conditions.

Note.— Where different snow plan considerations apply at aerodromes/heliports, this subparagraph may be subdivided accordingly.

AD 1.3 Index to aerodromes and heliports

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

- 1) aerodrome/heliport name and ICAO location indicator;
- 2) type of traffic permitted to use the aerodrome/heliport (international/national, IFR/VFR, scheduled/non-scheduled, general aviation, military and other); and
- 3) reference to AIP, Part 3 subsection in which aerodrome/heliport details are presented.

AD 1.4 Grouping of aerodromes/heliports

Brief description of the criteria applied by the State in grouping aerodromes/heliports for production/distribution/provision of information purposes (e.g. international/national;

primary/secondary; major/other; civil/military; etc.).

AD 1.5 Status of certification of aerodromes

A list of aerodromes in the State, indicating the status of certification, including:

- 1) aerodrome name and ICAO location indicator;
- 2) date and, if applicable, validity of certification; and
- 3) remarks, if any.

AD 2. AERODROMES

Note.— **** is to be replaced by the relevant ICAO location indicator.

****** AD 2.1 Aerodrome location indicator and name**

The requirement is for the ICAO location indicator allocated to the aerodrome and the name of aerodrome. An ICAO location indicator must be an integral part of the referencing system applicable to all subsections in section AD 2.

****** AD 2.2 Aerodrome geographical and administrative data**

The requirement is for aerodrome geographical and administrative data including:

- 1) aerodrome reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of aerodrome reference point from centre of the city or town which the aerodrome serves;
- 3) aerodrome elevation to the nearest metre or foot, reference temperature and mean low temperature;
- 4) where appropriate, geoid undulation at the aerodrome elevation position to the nearest metre or foot;
- 5) magnetic variation to the nearest degree, date of information and annual change;
- 6) name of aerodrome operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- 7) types of traffic permitted to use the aerodrome (IFR/VFR); and
- 8) remarks.

****** AD 2.3 Operational hours**

Detailed description of the hours of operation of services at the aerodrome, including:

- 1) aerodrome operator;
- 2) customs and immigration;
- 3) health and sanitation;
- AIS briefing office;
- 5) ATS reporting office (ARO);
- 6) MET briefing office;
- 7) air traffic service;
- 8) fuelling;
- 9) handling;
- 10) security;
- 11) de-icing; and
- 12) remarks.

****** AD 2.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the aerodrome, including:

- 1) cargo-handling facilities;
- 2) fuel and oil types;
- 3) fuelling facilities and capacity;
- 4) de-icing facilities;
- 5) hangar space for visiting aircraft;
- 6) repair facilities for visiting aircraft; and
- 7) remarks.

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

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

- 1) hotel(s) at or in the vicinity of aerodrome;
- 2) restaurant(s) at or in the vicinity of aerodrome;
- 3) transportation possibilities;
- 4) medical facilities;
- 5) bank and post office at or in the vicinity of aerodrome;
- 6) tourist office; and
- 7) remarks.

****** AD 2.6 Rescue and firefighting services**

Detailed description of the rescue and firefighting services and equipment available at the aerodrome, including:

- 1) aerodrome category for fire fighting;
- 2) rescue equipment;
- 3) capability for removal of disabled aircraft; and
- 4) remarks.

****** AD 2.7 Seasonal availability — clearing**

Detailed description of the equipment and operational priorities established for the clearance of aerodrome movement areas, including:

- 1) type(s) of clearing equipment;
- 2) clearance priorities; and
- 3) remarks.

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

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

- 1) designation, surface and strength of aprons;
- 2) designation, width, surface and strength of taxiways;
- 3) location and elevation to the nearest metre or foot of altimeter checkpoints;
- 4) location of VOR checkpoints;
- 5) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- 6) remarks.

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

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

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

- 1) use of aircraft stand identification signs, taxiway guidelines and visual docking/parking guidance system at aircraft stands;
- 2) runway and taxiway markings and lights;
- 3) stop bars and runway guard lights (if any);
- 4) other runway protection measures; and
- 5) remarks.

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

#OBS-DS# Detailed description of obstacles, including:

- 1) obstacles in Area 2:
 - a) obstacle identification or designation;
 - b) type of obstacle;
 - c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - d) obstacle elevation and height to the nearest metre or foot;
 - e) obstacle marking, and type and colour of obstacle lighting (if any);
 - f) if appropriate, an indication that the list of obstacles is available as digital data set in electronic form, and a reference to GEN 3.1.6; and
 - g) NIL indication, if appropriate.

Note 1.— Chapter 10, 10.1.1, provides a description of Area 2 while Appendix 8, Figure A8-

2, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.

Note 2.— Specifications governing the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations for obstacles in Area 2 are given in Annex 11, Appendix 5, Tables 1 and 2, and in Annex 14, Volume I, Appendix 5, Tables A5-1 and A5-2, respectively.

2) the absence of an Area 2 data set for the aerodrome is to be clearly stated and obstacle data are to be provided for:

- a) obstacles that penetrate the obstacle limitation surfaces;
 - b) obstacles that penetrate the take-off flight path area obstacle identification surface; and
 - c) other obstacles assessed as being hazardous to air navigation.
- 3) indication that information on obstacles in Area 3 is not provided, or if provided:
- a) obstacle identification or designation;
 - b) type of obstacle;
 - c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - d) obstacle elevation and height to the nearest tenth of a metre or tenth of a foot;
 - e) obstacle marking, and type and colour of obstacle lighting (if any);
 - f) if appropriate, an indication that the list of obstacles is available as digital data set in electronic form, and a reference to GEN 3.1.6; and
 - g) NIL indication, if appropriate.

Note 1.— Chapter 10, 10.1.1, provides a description of Area 3 while Appendix 8, Figure A8-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

Note 2.— Specifications governing the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations for obstacles in Area 3 are given in Annex 14, Volume I, Appendix 5, Tables A5-1 and A5-2, respectively.

****** AD 2.11 Meteorological information provided**

Detailed description of meteorological information provided at the aerodrome and an indication of which meteorological office is responsible for the service enumerated, including:

- 1) name of the associated meteorological office;
- 2) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- 3) office responsible for preparation of TAFs and periods of validity and interval of issuance of the forecasts;
- 4) availability of the trend forecasts for the aerodrome, and interval of issuance;
- 5) information on how briefing and/or consultation is provided;
- 6) types of flight documentation supplied and language(s) used in flight documentation;
- 7) charts and other information displayed or available for briefing or consultation;
- 8) supplementary equipment available for providing information on meteorological conditions, e.g. weather radar and receiver for satellite images;
- 9) the air traffic services unit(s) provided with meteorological information; and
- 10) additional information (e.g. concerning any limitation of service, etc.).

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

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

- 1) designations;
- 2) true bearings to one-hundredth of a degree;
- 3) dimensions of runways to the nearest metre or foot;
- 4) strength of pavement (PCN and associated data) and surface of each runway and associated stopways;
- 5) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end and, where appropriate, geoid undulation of:
— thresholds of a non-precision approach runway to the nearest metre or foot; and

- thresholds of a precision approach runway to the nearest tenth of a metre or tenth of a foot;
- 6) elevations of:
 - thresholds of a non-precision approach runway to the nearest metre or foot; and
 - thresholds and the highest elevation of the touchdown zone of a precision approach runway to the nearest tenth of a metre or tenth of a foot;
- 7) slope of each runway and associated stopways;
- 8) dimensions of stopway (if any) to the nearest metre or foot;
- 9) dimensions of clearway (if any) to the nearest metre or foot;
- 10) dimensions of strips;
- 11) the existence of an obstacle-free zone; and
- 12) remarks.

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

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

- 1) runway designator;
- 2) take-off run available;
- 3) take-off distance available, and if applicable, alternative reduced declared distances;
- 4) accelerate-stop distance available;
- 5) landing distance available; and
- 6) remarks, including runway entry or start point where alternative reduced declared distances have been declared.

If a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this must be declared and the words “not usable” or the abbreviation “NU” entered (Annex 14, Volume I, Attachment A, Section 3).

****** AD 2.14 Approach and runway lighting**

Detailed description of approach and runway lighting, including:

- 1) runway designator;
- 2) type, length and intensity of approach lighting system;
- 3) runway threshold lights, colour and wing bars;
- 4) type of visual approach slope indicator system;
- 5) length of runway touchdown zone lights;
- 6) length, spacing, colour and intensity of runway centre line lights;
- 7) length, spacing, colour and intensity of runway edge lights;
- 8) colour of runway end lights and wing bars;
- 9) length and colour of stopway lights; and
- 10) remarks.

****** AD 2.15 Other lighting, secondary power supply**

Description of other lighting and secondary power supply, including:

- 1) location, characteristics and hours of operation of aerodrome beacon/identification beacon (if any);
- 2) location and lighting (if any) of anemometer/landing direction indicator;
- 3) taxiway edge and taxiway centre line lights;
- 4) secondary power supply including switch-over time; and
- 5) remarks.

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

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

- 1) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric centre of touchdown and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 2) TLOF and/or FATO area elevation:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;

- 3) TLOF and FATO area dimensions to the nearest metre or foot, surface type, bearing strength and marking;
- 4) true bearings to one-hundredth of a degree of FATO;
- 5) declared distances available, to the nearest metre or foot;
- 6) approach and FATO lighting; and
- 7) remarks.

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

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

- 1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- 2) vertical limits;
- 3) airspace classification;
- 4) call sign and language(s) of the ATS unit providing service;
- 5) transition altitude;
- 6) hours of applicability; and
- 7) remarks.

****** AD 2.18 Air traffic services communication facilities**

Detailed description of air traffic services communication facilities established at the aerodrome, including:

- 1) service designation;
- 2) call sign;
- 3) channel(s);
- 4) logon address, as appropriate;
- 5) hours of operation; and
- 6) remarks.

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

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

- 1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS, and GBAS and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up
- 2) identification, if required;
- 3) frequency(ies), channel number(s), service provider, and reference path identifier(s) (RPI), as appropriate;
- 4) hours of operation, as appropriate;
- 5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft), elevation of GBAS reference point to the nearest metre or foot, and the ellipsoid height of the point to the nearest metre or foot. For SBAS, the ellipsoid height of the landing threshold point (LTP) or the fictitious threshold point (FTP) to the nearest metre or foot;
- 7) service volume radius from the GBAS reference point to the nearest kilometre or nautical mile; and
- 8) remarks.

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

****** AD 2.20 Local aerodrome regulations**

Detailed description of regulations applicable to the use of the aerodrome including the acceptability of training flights, non radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

****** AD 2.21 Noise abatement procedures**

Detailed description of noise abatement procedures established at the aerodrome.

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

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

- 1) runway(s) and associated equipment authorized for use under low visibility procedures;
- 2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- 3) description of ground marking/lighting for use under low visibility procedures; and
- 4) remarks.

****** AD 2.23 Additional information**

Additional information at the aerodrome, such as an indication of bird concentrations at the aerodrome, together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 2.24 Charts related to an aerodrome**

The requirement is for charts related to an aerodrome to be included in the following order:

- 1) Aerodrome/Heliport Chart — ICAO;
- 2) Aircraft Parking/Docking Chart — ICAO;
- 3) Aerodrome Ground Movement Chart — ICAO;
- 4) Aerodrome Obstacle Chart — ICAO Type A (for each runway);
- 5) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- 6) Precision Approach Terrain Chart — ICAO (precision approach Cat II and III runways);
- 7) Area Chart — ICAO (departure and transit routes);
- 8) Standard Departure Chart — Instrument — ICAO;
- 9) Area Chart — ICAO (arrival and transit routes);
- 10) Standard Arrival Chart — Instrument — ICAO;
- 11) ATC Surveillance Minimum Altitude Chart — ICAO;
- 12) Instrument Approach Chart — ICAO (for each runway and procedure type);
- 13) Visual Approach Chart — ICAO; and
- 14) bird concentrations in the vicinity of the aerodrome.

If some of the charts are not produced, a statement to this effect must be given in section GEN 3.2, Aeronautical charts.

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

AD 3. HELIPORTS

When a helicopter landing area is provided at the aerodrome, associated data must be listed only under **** AD 2.16.

Note.— **** *is to be replaced by the relevant ICAO location indicator.*

****** AD 3.1 Heliport location indicator and name**

The requirement is for the ICAO location indicator assigned to the heliport and the name of heliport. An ICAO location indicator must be an integral part of the referencing system applicable to all subsections in section AD 3.

****** AD 3.2 Heliport geographical and administrative data**

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

- 1) heliport reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of heliport reference point from centre of the city or town which the heliport serves;
- 3) heliport elevation to the nearest metre or foot, reference temperature and mean low temperature;
- 4) where appropriate, geoid undulation at the heliport elevation position to the nearest metre or foot;
- 5) magnetic variation to the nearest degree, date of information and annual change;
- 6) name of heliport operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- 7) types of traffic permitted to use the heliport (IFR/VFR); and

8) remarks.

****** AD 3.3 Operational hours**

Detailed description of the hours of operation of services at the heliport, including:

- 1) heliport operator;
- 2) customs and immigration;
- 3) health and sanitation;
- 4) AIS briefing office;
- 5) ATS reporting office (ARO);
- 6) MET briefing office;
- 7) air traffic service;
- 8) fuelling;
- 9) handling;
- 10) security;
- 11) de-icing; and
- 12) remarks.

****** AD 3.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the heliport, including:

- 1) cargo-handling facilities;
- 2) fuel and oil types;
- 3) fuelling facilities and capacity;
- 4) de-icing facilities;
- 5) hangar space for visiting helicopter;
- 6) repair facilities for visiting helicopter; and
- 7) remarks.

****** AD 3.5 Passenger facilities**

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

- 1) hotel(s) at or in the vicinity of the heliport;
- 2) restaurant(s) at or in the vicinity of the heliport;
- 3) transportation possibilities;
- 4) medical facilities;
- 5) bank and post office at or in the vicinity of the heliport;
- 6) tourist office; and
- 7) remarks.

****** AD 3.6 Rescue and firefighting services**

Detailed description of the rescue and firefighting services and equipment available at the heliport, including:

- 1) heliport category for fire fighting;
- 2) rescue equipment;
- 3) capability for removal of disabled helicopter; and
- 4) remarks.

****** AD 3.7 Seasonal availability — clearing**

Detailed description of the equipment and operational priorities established for the clearance of heliport movement areas, including:

- 1) type(s) of clearing equipment;
- 2) clearance priorities; and
- 3) remarks.

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

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

- 1) designation, surface and strength of aprons, helicopter stands;
- 2) designation, width, and surface type of helicopter ground taxiways;
- 3) width and designation of helicopter air taxiway and air transit route;

- 4) location and elevation to the nearest metre or foot of altimeter checkpoints;
- 5) location of VOR checkpoints;
- 6) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- 7) remarks.

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

**** AD 3.9 Markings and markers

Brief description of final approach and take-off area and taxiway markings and markers, including:

- 1) final approach and take-off markings;
- 2) taxiway markings, air taxiway markers and air transit route markers; and
- 3) remarks.

**** AD 3.10 Heliport obstacles

~~#OBS-DS#~~ Detailed description of obstacles, including:

- 1) obstacle identification or designation;
- 2) type of obstacle;
- 3) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
- 4) obstacle elevation and height to the nearest metre or foot;
- 5) obstacle marking, and type and colour of obstacle lighting (if any);
- 6) if appropriate, an indication that the list of obstacles is available as digital data set in electronic form, and a reference to GEN 3.1.6; and
- 7) NIL indication, if appropriate.

**** AD 3.11 Meteorological information provided

Detailed description of meteorological information provided at the heliport and an indication of which meteorological office

is responsible for the service enumerated, including:

- 1) name of the associated meteorological office;
- 2) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- 3) office responsible for preparation of TAFs, and periods of validity of the forecasts;
- 4) availability of the trend forecasts for the heliport, and interval of issuance;
- 5) information on how briefing and/or consultation is provided;
- 6) type of flight documentation supplied and language(s) used in flight documentation;
- 7) charts and other information displayed or available for briefing or consultation;
- 8) supplementary equipment available for providing information on meteorological conditions, e.g. weather radar and receiver for satellite images;
- 9) the air traffic services unit(s) provided with meteorological information; and
- 10) additional information (e.g. concerning any limitation of service, etc.).

**** AD 3.12 Heliport data

Detailed description of heliport dimensions and related information, including:

- 1) heliport type — surface-level, elevated or helideck;
- 2) touchdown and lift-off (TLOF) area dimensions to the nearest metre or foot;
- 3) true bearings to one-hundredth of a degree of final approach and take-off (FATO) area;
- 4) dimensions to the nearest metre or foot of FATO, and surface type;
- 5) surface and bearing strength in tonnes (1 000 kg) of TLOF;
- 6) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric centre of TLOF or of each threshold of FATO:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 7) TLOF and/or FATO slope and elevation:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;

- 8) dimensions of safety area;
- 9) dimensions, to the nearest metre or foot, of helicopter clearway;
- 10) the existence of an obstacle-free sector; and
- 11) remarks.

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

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

- 1) take-off distance available, and if applicable, alternative reduced declared distances;
- 2) rejected take-off distance available;
- 3) landing distance available; and
- 4) remarks, including entry or start point where alternative reduced declared distances have been declared.

****** AD 3.14 Approach and FATO lighting**

Detailed description of approach and FATO lighting, including:

- 1) type, length and intensity of approach lighting system;
- 2) type of visual approach slope indicator system;
- 3) characteristics and location of FATO area lights;
- 4) characteristics and location of aiming point lights;
- 5) characteristics and location of TLOF lighting system; and
- 6) remarks.

****** AD 3.15 Other lighting, secondary power supply**

Description of other lighting and secondary power supply, including:

- 1) location, characteristics and hours of operation of heliport beacon;
- 2) location and lighting of wind direction indicator (WDI);
- 3) taxiway edge and taxiway centre line lights;
- 4) secondary power supply including switch-over time; and
- 5) remarks.

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

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

- 1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- 2) vertical limits;
- 3) airspace classification;
- 4) call sign and language(s) of ATS unit providing service;
- 5) transition altitude;
- 6) hours of applicability; and
- 7) remarks.

****** AD 3.17 Air traffic services communication facilities**

Detailed description of air traffic services communication facilities established at the heliport, including:

- 1) service designation;
- 2) call sign;
- 3) frequency(ies);
- 4) hours of operation; and
- 5) remarks.

****** AD 3.18 Radio navigation and landing aids**

Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area

procedures at the heliport, including:

- 1) type of aids, magnetic variation (for VOR, station declination used for technical line-up of the aid) to the nearest degree, and type of operation for ILS, MLS, basic GNSS, SBAS and GBAS;
- 2) identification, if required;
- 3) frequency(ies), as appropriate;

- 4) hours of operation, as appropriate;
- 5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft); and 7) remarks.

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

****** AD 3.19 Local heliport regulations**

Detailed description of regulations applicable to the use of the heliport, including the acceptability of training flights, non radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

****** AD 3.20 Noise abatement procedures**

Detailed description of noise abatement procedures established at the heliport.

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

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

- 1) touchdown and lift-off (TLOF) area(s) and associated equipment authorized for use under low visibility procedures;
- 2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- 3) description of ground marking/lighting for use under low visibility procedures; and
- 4) remarks.

****** AD 3.22 Additional information**

Additional information about the heliport, such as an indication of bird concentrations at the heliport together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 3.23 Charts related to a heliport**

The requirement is for charts related to a heliport to be included in the following order:

- 1) Aerodrome/Heliport Chart — ICAO;
- 2) Area Chart — ICAO (departure and transit routes);
- 3) Standard Departure Chart — Instrument — ICAO;
- 4) Area Chart — ICAO (arrival and transit routes);
- 5) Standard Arrival Chart — Instrument — ICAO;
- 6) ATC Surveillance Minimum Altitude Chart — ICAO;
- 7) Instrument Approach Chart — ICAO (for each procedure type);
- 8) Visual Approach Chart — ICAO; and
- 9) bird concentrations in the vicinity of heliport.

If some of the charts are not produced, a statement to this effect must be given in section GEN 3.2, Aeronautical charts.

APPENDIX 4. AERONAUTICAL DATA PUBLICATION RESOLUTION

Table A4-1. Latitude and longitude

Latitude and longitude	Publication resolution	Chart resolution
Flight information region boundary point	1 min	As plotted
P, R, D area boundary points (outside CTA/CTR boundaries)	1 min	As plotted
P, R, D area boundary points (inside CTA/CTR boundaries)	1 sec	As plotted
CTA/CTR boundary points	1 sec	As plotted
En-route NAVAIDS, intersections and waypoints, and holding, and STAR/SID points	1 sec	1 sec
Obstacles in Area 1 (the entire State territory)	1 sec	As plotted
Aerodrome/heliport reference point	1 sec	1 sec
NAVAIDS located at the aerodrome/heliport	1/10 sec	As plotted
Obstacles in Area 3	1/10 sec	1/10 sec
Obstacles in Area 2 (the part within the aerodrome boundary)	1/10 sec	1/10 sec
Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure	1/10 sec	1 sec
Runway threshold	1/100 sec	1 sec
Runway end (flight path alignment point)	1/100 sec	1 sec
Runway centre line points		
Runway holding position	1/100 sec	1 sec
Taxiway centre line/parking guidance line points (Annex 14 Pt1)	1/100 sec	1/100 sec
Ground Taxiway centre line points, air taxiway and transit route points (Annex 14 Pt2)		1/100 sec
Ground/Taxiway intersection marking line	1/100 sec	1 sec
Ground/Exit guidance line	1/100 sec	1 sec
Aircraft stand points/INS checkpoints	1/100 sec	
Geometric centre of TLOF or FATO thresholds, heliports	1/100 sec	1 sec
Apron boundaries (polygon)	1/10 sec	1 sec
De-icing/anti-icing facility (polygon)	1/10 sec	1 sec
Aircraft/Helicopter stand points / INS checkpoints		1/100 sec

Table A4-2. Elevation/altitude/height

Elevation/altitude/height	Publication resolution	Chart resolution
Aerodrome/heliport elevation	1 m or 1 ft	1 m or 1 ft
WGS-84 geoid undulation at aerodrome/heliport elevation position	1 m or 1 ft	1 m or 1 ft
Runway or FATO threshold, non-precision approaches	1 m or 1 ft	1 m or 1 ft
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches	1 m or 1 ft	1 m or 1 ft

Runway or FATO threshold, precision approaches	0.1 m or 0.1 ft	0.5 m or 1 ft
WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches	0.1 m or 0.1 ft	0.5 m or 1 ft
Threshold crossing height, (Reference datum height) precision approaches	0.1 m or 0.1 ft	0.5 m or 1 ft
Obstacle clearance altitude/height		As specified in PANS-OPS (Doc 8168)
Runway centre line points		
Taxiway centre line/parking guidance line points (Annex 14 Pt1)		
Ground Taxiway centre line points, air taxiway and transit route points (Annex 14 Pt2)		
Obstacles in Area 2 (the part within the aerodrome boundary)	1 m or 1 ft	1 m or 1 ft
Obstacles in Area 3	0.1 m or 0.1 ft	1 m or 1 ft
Obstacles in Area 1 (the entire State territory)	1 m or 1 ft	3 m (10 ft)
Terrain data Area 1	1m	-
Terrain data Area 2	0.1 m	-
Terrain data Area 3	0.1 m	-
Terrain data Area 4	0.1 m	-
Distance measuring equipment/precision (DME/P)	3 m (10 ft)	
Distance measuring equipment (DME) elevation	30 m (100 ft)	30 m (100 ft)
Instrument approach procedures altitude		As specified in PANS-OPS (Doc 8168)
upper and lower altitude limit at a significant point,	50 m or 100 ft	50 m or 100 ft

Table A4-3. Declination and magnetic variation

Declination and magnetic variation	Publication resolution	Chart resolution
VHF NAVAID station declination used for technical line-up	1 degree	
NDB NAVAID magnetic variation	1 degree	
Aerodrome/heliport magnetic variation	1 degree	1 degree
ILS localizer antenna magnetic variation	1 degree	
MLS azimuth antenna magnetic variation	1 degree	

Table A4-4. Bearing

Bearing	Publication resolution	Chart resolution
Airway segments	1 degree	1 degree
Bearing used for the formation of an en-route and of a terminal fix	1/10 degree	1/10 degree
Terminal arrival/departure route segments	1 degree	1 degree
Bearing used for the formation of an instrument approach procedure fix	1/100 degree	1/10 degree
ILS localizer alignment (True)	1/100 degree	1 degree
MLS zero azimuth alignment (True)	1/100 degree	1 degree

Runway and FATO bearing (True)	1/100 degree	1 degree
true track between each successive significant point;	1/10 degree	1/10 degree
magnetic track between each successive significant point	1 degree	1 degree

Table A4-5. Gradients and angles

Type of gradient/angle	Publication resolution	Chart resolution
Non-precision final approach descent gradient		0.1 per cent
Final approach descent angle (Non-precision approach or approach with vertical guidance)		0.1 degree
Precision approach glide path/elevation angle		0.1 degree

Table A4-6. Length/distance/dimension

Length/distance/dimension	Publication resolution	Chart resolution
Airway segment length	1/10 km or 1/10 NM	1 km or 1 NM
Distance used for the formation of an en-route fix	1/10 km or 1/10 NM	2/10 km or 1/10 NM
Terminal arrival/departure route segment length	1/100 km or 1/100 NM	1 km or 1 NM
Distance used for the formation of a terminal and instrument approach procedure fix	1/100 km or 1/100 NM	2/10 km or 1/10 NM
Runway and FATO length, TLOF dimensions	1 m or 1 ft	1 m
Runway width	1 m or 1 ft	1 m
Displaced threshold distance	1 m or 1 ft	
Clearway length and width	1 m or 1 ft	
Stopway length and width	1 m or 1 ft	1 m
Landing distance available	1 m or 1 ft	1 m
Take-off run available	1 m or 1 ft	1 m
Take-off distance available	1 m or 1 ft	1 m
Rejected Take off distance available		
Accelerate-stop distance available	1 m or 1 ft	1 m
Runway shoulder width	1 m or 1 ft	
Taxiway width	1 m or 1 ft	
Taxiway shoulder width	1 m or 1 ft	
ILS localizer antenna-runway end/FATO end, distance	1 m or 1 ft	As plotted
ILS glide slope antenna-threshold, distance along centre line	1 m or 1 ft	As plotted
ILS marker-threshold distance	1 m or 1 ft	2/10 km or 1/10 NM
ILS DME antenna-threshold, distance along centre line	1 m or 1 ft	As plotted
MLS azimuth antenna-runway end/FATO end, distance	1 m or 1 ft	As plotted
MLS elevation antenna-threshold, distance along centre line	1 m or 1 ft	As plotted
MLS DME/P antenna-threshold, distance along centre line	1 m or 1 ft	As plotted

APPENDIX 5. NOTAM FORMAT

To be copied from current Annex 15, Appendix 6. This appendix contains tables and images that are difficult to be formatted in Google Docs. As the final document editing will be done in Word, these appendices empty in Google Docs.

Changes to be made, based on Study Notes:

“If the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the second and third letters (e.g. ~~QXXAK~~); If subject is “XX”, use “XX” also for condition.”

Align the text and all examples on prescribed NOTAM format to exclude a ‘blank’ between the date-time group and the word “EST”.

APPENDIX 6. SNOWTAM FORMAT

To be copied from current Annex 15, Appendix 2. This appendix contains tables and images that are difficult to be formatted in Google Docs. As the final document editing will be done in Word, these appendices empty in Google Docs.

Eventually, to be completely replaced after the approval of the “FTF” State Letter.

APPENDIX 7. ASHTAM FORMAT

To be copied from current Annex 15, Appendix 3. This appendix contains tables and images that are difficult to be formatted in Google Docs. As the final document editing will be done in Word, these appendices empty in Google Docs.

No changes as compared to the current Annex 15 SARPS

APPENDIX 8. TERRAIN AND OBSTACLE ATTRIBUTES PROVISION REQUIREMENTS

Table A8-1. Terrain attributes

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

Table A8-2. Obstacle attributes

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