



**RWANDA CIVIL AVIATION AUTHORITY**

---

**RCATS - AIS001**

**RWANDA CIVIL AVIATION TECHNICAL STANDARDS –  
AERONAUTICAL INFORMATION SERVICES  
(RCATS-AIS)**

**Fourth Edition  
NOVEMBER 2025**

## **FOREWORD**

The Director General, under Article 11 of the law N° 20/2018 of 29/04/2018, is empowered to issue instructions in relation to the provisions of the said Law and related regulations, to ensuring safety of civil aviation

Pursuant to the Regulation 21.025 of Part 25 (Aeronautical Information Services) to the Ministerial Order N°01/CAB.M/019 of 6/02/2019, the Rwanda Civil Aviation Technical Standards - Aeronautical Information Service is issued by the Authority to prescribe standards and requirements to be met by AIS providers.

The standards in RCATS- Aeronautical Information Service are based mainly on standards and recommended practices stipulated in Annexes 15 to the Convention on International Civil Aviation (the Chicago) and with such modifications as may be determined by the Authority to be applicable in Rwanda.

Amendments to RCATS- Aeronautical Information Services is a responsibility of the Authority and this manual takes care of amendment 44 to the annex 15 and amendment 4 to PANS-AIM. Readers should forward advice of errors, inconsistencies or suggestions for improvement to the Authority.

This edition supersedes the Third Edition of May 2017.



Director General  
Rwanda Civil Aviation Authority

**DISTRIBUTION LIST**

| <b>Serial No.</b> | <b>Issued to</b>                                    | <b>Date</b> |
|-------------------|-----------------------------------------------------|-------------|
| 01.               | Director General                                    |             |
| 02.               | Director ANS                                        |             |
| 03.               | Director AISS                                       |             |
| 04.               | Head MET department                                 |             |
| 05.               | Head ATC department                                 |             |
| 06.               | Head CNS department                                 |             |
| 07.               | Head AIM department                                 |             |
| 08.               | International NOTAM Office                          |             |
| 09.               | Kigali International Airport Reporting Office (BOF) |             |
| 10.               | Kigali International Airport Cartography Office     |             |
| 11.               | Kamembe International Airport                       |             |
| 12.               | Gisenyi Airport                                     |             |
| 13.               | FSS library                                         |             |
|                   |                                                     |             |
|                   |                                                     |             |
|                   |                                                     |             |
|                   |                                                     |             |
|                   |                                                     |             |
|                   |                                                     |             |
|                   |                                                     |             |

**RECORD OF AMENDMENTS**

| <b>No</b> | <b>Date applicable</b>         | <b>Date Entered</b>            | <b>Entered By</b>    |
|-----------|--------------------------------|--------------------------------|----------------------|
| 1         | 30 <sup>th</sup> March 2015    | 2 <sup>nd</sup> March 2015     | NIYIKIZA Jean Claude |
| 2         | 31 <sup>st</sup> June 2017     | 1 <sup>st</sup> June 2017      | NIYIKIZA Jean Claude |
| 3         | 20 <sup>th</sup> February 2019 | 1 <sup>st</sup> December 2018  | NIYIKIZA Jean Claude |
| 4         | 31 <sup>st</sup> May 2020      | 15 <sup>th</sup> March 2020    | NIYIKIZA Jean Claude |
| 5         | 31 <sup>st</sup> December 2020 | 1 <sup>st</sup> December 2020  | NIYIKIZA Jean Claude |
| 6         | 30 <sup>th</sup> November 2022 | 22 <sup>nd</sup> November 2022 | NIYIKIZA Jean Claude |
| 7         | 30 <sup>th</sup> November 2024 | 20 <sup>th</sup> November 2024 | NIYIKIZA Jean Claude |
| 8         | 27 <sup>th</sup> November 2025 | 11 <sup>th</sup> November 2025 | NIYIKIZA Jean Claude |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |
|           |                                |                                |                      |

## TABLE OF CONTENTS

|                                                                  |      |
|------------------------------------------------------------------|------|
| FOREWORD.....                                                    | i    |
| DISTRIBUTION LIST.....                                           | ii   |
| RECORD OF AMENDMENTS .....                                       | iii  |
| TABLE OF CONTENTS .....                                          | iv   |
| Chapter 1 GENERAL .....                                          | 1-1  |
| 1.1 Definitions .....                                            | 1-1  |
| Chapter 2 AERONAUTICAL INFORMATION MANAGEMENT.....               | 2-1  |
| 2.1 Information management requirements.....                     | 2-1  |
| 2.2 Data Integrity Monitoring and Assurance .....                | 2-3  |
| 2.3 Coordination between States .....                            | 2-4  |
| 2.4 Cost recovery.....                                           | 2-4  |
| Chapter 3 QUALITY AND TRAINING MANAGEMENT .....                  | 3-1  |
| 3.1 Quality Management System .....                              | 3-1  |
| 3.2 Training Management .....                                    | 3-2  |
| 3.3 Logbook Requirement.....                                     | 3-2  |
| 3.4 Organizational structure .....                               | 3-3  |
| Chapter 4 AERONAUTICAL DATA REQUIREMENTS.....                    | 4-1  |
| 4.1 Data Origination Requirements.....                           | 4-1  |
| 4.2 Metadata Requirements .....                                  | 4-1  |
| Chapter 5 AERONAUTICAL INFORMATION PRODUCTS AND SERVICES .....   | 5-1  |
| 5.1 General .....                                                | 5-1  |
| 5.2 Aeronautical Information in A Standardized Presentation..... | 5-1  |
| 5.3 Digital Data .....                                           | 5-14 |
| 5.4 Distribution Services .....                                  | 5-22 |
| 5.5 Pre-Flight Information Services .....                        | 5-23 |
| Chapter 6 AERONAUTICAL INFORMATION UPDATES.....                  | 6-1  |
| 6.1 Aeronautical Information Product Updates.....                | 6-1  |

|                                                                                 |        |
|---------------------------------------------------------------------------------|--------|
| Appendix 1. AERONAUTICAL DATA CATALOGUE .....                                   | APP1-1 |
| Appendix 2. CONTENTS OF THE AERONAUTICAL INFORMATION PUBLICATION<br>(AIP) ..... | APP2-1 |
| Appendix 3. NOTAM FORMAT .....                                                  | APP3-1 |
| Appendix4. SNOWTAM FORMAT .....                                                 | APP4-1 |
| Appendix5. ASHTAM FORMAT .....                                                  | APP5-1 |
| Appendix6. TERRAIN AND OBSTACLE ATTRIBUTES PROVISION REQUIREMENTS<br>.....      | APP6-1 |
| Appendix7. PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM .....                    | APP7-1 |
| Appendix8. TERRAIN AND OBSTACLE DATA REQUIREMENTS .....                         | APP8-1 |
| Appendix9. COORDINATED UNIVERSAL TIME .....                                     | APP9-1 |

## Chapter 1 GENERAL

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

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

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

### 1.1 Definitions

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

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

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

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

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

**Aeronautical chart.** A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

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

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

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

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

**Aeronautical information management (AIM).** The dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

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

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

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

**Aeronautical Information Publication (AIP).** A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

**Aeronautical information service (AIS).** A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

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

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

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

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

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

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

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

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

**Area navigation route.** An ATS route established for the use of aircraft capable of employing area navigation.

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

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

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

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

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

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

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

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

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

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

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

**Bare Earth.** Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and manmade 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.

**Conventional navigation route.** An ATS route established by reference to ground navigation aids.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Flight and flow – information for a collaborative environment (FF-ICE).** Information necessary for planning, coordination and notification of flights, exchanged in a standardized format between members of the ATM community, including those involved in flight operations and aerodrome operations.

**Flight and flow – information for a collaborative environment (FF-ICE) services.** A set of services established for the purposes of facilitating the exchange of FF-ICE, accurate assessment of demands, appropriate resource planning and optimizing flight planning and execution.

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

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

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

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

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

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

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

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

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

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

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

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

- a) routine data: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) essential data: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) critical data: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

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

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

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

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

**Metadata.** Data about data (ISO 19115\*).

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

**Meteorological authority.** The entity arranging for the provision of meteorological service for international air navigation on behalf of a Contracting State, and providing regulation and oversight of the meteorological service

**Meteorological service provider.** The relevant entity designated to provide meteorological service for international air navigation on behalf of a Contracting State.

**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 RCATS as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this RCATS is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

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

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

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

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

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

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

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

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

**Pavement classification rating (PCR).** A number expressing the bearing strength of a pavement.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**System-wide information management (SWIM).** Means standards, infrastructure and governance enabling the management of ATM-related information and its exchange between qualified parties via interoperable information services.

**System-wide information management (SWIM) region.** Means a geographical area in which a group of States and/or ATM stakeholders has agreed upon common governance in support of regional system-wide information management implementation.

Note. — A SWIM region can be an ICAO region or any other area in which a community of interest has agreed on common governance. Communities of interest are established in a variety of ways and may be composed of members from one or more functions and organizations as needed for a shared mission.

**System-wide information management (SWIM) registry.** A directory containing entries with the information (metadata) necessary to discover and access information services.

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

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

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

- the origin of materials and parts;
- the processing history; and
- the distribution and location of the product after delivery.

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

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

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

**VOLMET.** Meteorological information for aircraft in flight.

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

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

\* ISO Standard

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

## **Chapter 2 AERONAUTICAL INFORMATION MANAGEMENT**

### **2.1 Information management requirements**

Management of aeronautical data and aeronautical information shall include the following processes:

- a) collection;
- b) processing;
- c) quality control; and
- d) distribution.

#### **2.1.1 Collection**

2.1.1.1 The identification of data originators shall be documented based on the scope of aeronautical data and aeronautical information to be collected.

2.1.1.2 A record of data originators shall be maintained.

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

2.1.1.3 Each data element to be collected shall be mapped to an identified data originator, in accordance with the formal arrangements established between data originators and the aeronautical information service (AIS) Provider.

2.1.1.4 The list of aeronautical information subjects and their properties, as contained in Appendix 1, shall be used to establish formal arrangements between the originators and the AIS Provider.

2.1.1.5 Valid codes for the code lists of the aeronautical data properties and sub-properties, as contained in Appendix 1, shall be defined in the formal arrangements between the originators and the AIS Provider.

2.1.1.6 Appendix 1 shall be considered as a reference for aeronautical data and aeronautical information origination and publication requirements.

Note 1. — Appendix 1 presents the scope of data and information that can be collected and maintained by the AIS.

Note 2. — Appendix 1 provides a common data description that can be used by data originators and the AIS.

### 2.1.2 Processing

2.1.2.1 Collected data shall be verified and validated for compliance with data quality requirements.

Note 1. — Appendix 1 contains aeronautical data attributes and quality requirements (accuracy, resolution and integrity).

Note 2.— Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity and 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 Radio Technical Commission for Aeronautics (RTCA) Document DO-201A/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 Management (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; and
- 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 shall 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 may 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 shall be implemented to ensure compliance with product specifications contained in Chapter 5.

2.1.3.2 The service provider shall ensure the consistency of aeronautical data contained in different aeronautical information products.

2.1.4 Distribution (to be developed)

## **2.2 Data Integrity Monitoring and Assurance**

2.2.1 Data integrity shall be assured by employing cryptographic technologies (e.g. hash functions, message authentication codes, asymmetric and symmetric encryption, and digital certificates).

Note. — Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA DO-200B/EUROCAE ED-76A — Standards for Processing Aeronautical Data.

2.2.2 The technical means used for data error detection shall be based on the use of systematic cycling codes.

Note. — The means to implement systematic cycling codes include the use of hash functions and cyclic redundancy check (CRC).

### **2.3 Coordination between States**

The AIS Provider shall establish a bilateral or multilateral working arrangements between one or more neighbouring States, the established arrangement offers an effective safety net for ensuring the consistency of aeronautical data across borders and facilitates the identification of possible data inconsistencies due to insufficient communication between States (e.g. concerning common airspace boundaries or cross-border routes).

### **2.4 Cost recovery**

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

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

## **Chapter 3 QUALITY AND TRAINING MANAGEMENT**

### **3.1 Quality Management System**

Note 1. — This section provides general requirements on the quality management system (QMS) related to aeronautical information management (AIM) processes.

Note 2. — Detailed guidance can be found in the Manual on the Quality Management System for Aeronautical Information Management (Doc 9839).

3.1.1 The general requirements for a QMS shall be to:

- a) develop a quality manual that includes the scope of a QMS as applied to AIM processes;
- b) identify the processes needed for the QMS;
- c) determine the sequence and interaction of these processes;
- d) determine criteria and methods required to ensure the effective operation and control of these processes;
- e) ensure the availability of information necessary to support the operation and monitoring of these processes;
- f) measure, monitor and analyse these processes, and implement action necessary to achieve planned results and continual improvement; and
- g) maintain appropriate records that are necessary to provide confidence of conformity of the processes and resulting product.

3.1.2 In the framework of the QMS, a user feedback system shall be defined and implemented.

Note 1. — Quality management may be provided by a single QMS or a series of QMS.

Note 2. — The International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme.

Note 3. — Formal arrangements concerning data quality between the originator and the aeronautical information service (AIS) and between the AIS and the next intended user may be used to manage the aeronautical information data chain.

### 3.2 Training Management

*Note 1. — This section provides general competency-based training and assessment (CBTA) requirements related to AIM.*

*Note 2. — Detailed guidance concerning the CBTA methodology implementation is contained in the Manual on Aeronautical Information Services Training (Doc 9991).*

3.2.1 The general requirements for the establishment of processes for CBTA within the context of the established QMS shall be to:

- a) analyse training needs based on requirements (such as legislative, regulatory, operational, technical and organizational);
- b) identify required competencies and associated knowledge, skills and attitudes;
- c) design, develop and implement a CBTA programme and associated training material;
- d) train and assess assigned personnel to demonstrate required competencies;
- e) monitor competencies and associated knowledge, skills and attitudes;
- f) evaluate and update training to be consistent with emerging requirements and feedback; and
- g) maintain and retain training records.

3.2.2 The training methodology established in accordance with RCARS Part 25 regulation 25.180 (e) shall follow the competency-based training and assessment (CBTA) methodology.

*Note 1.— Provisions related to the CBTA methodology are contained in the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868) and in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).*

*Note 2.— Additional guidance concerning a CBTA methodology to ensure the competency of personnel in accordance with the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868) is contained in the Manual on Aeronautical Information Services Training (Doc 9991).*

### 3.3 Logbook Requirement

3.3.1 AIS provider shall ensure that all important information is recorded in log book, entries in log books include the date/time of the entry and the occurrence and are to be signed by the AIM staff person making the entry. Site logbook records are to be retained for at least five years.

3.3.2 All entries shall be complete, clear, correct and intelligible. Superfluous marks or notations shall not be made in the log.

3.3.3 Any necessary correction in the log shall be made only by the person making the initial entry. The correction shall be accomplished by drawing or typing a single line through the incorrect entry,

initialing same, recording the time and date of correction. The correct entry shall be made on the next line after the last entry.

### **3.4 Organizational structure**

3.4.1 An AIS provider shall set up and manage its organization according to a structure that supports the safe, efficient and continuous provision of services.

3.4.2 The organizational structure shall define:

- a) the authority, qualifications, duties and responsibilities of the nominated post holders, in particular of the management personnel in charge of safety, quality, security, finance and human resources related functions;
- b) the relationship and reporting lines between different parts and processes of the organization.

## **Chapter 4 AERONAUTICAL DATA REQUIREMENTS**

### **4.1 Data Origination Requirements**

4.1.1 Data shall be collected and transmitted to the AIS in accordance with the accuracy requirements and integrity classification specified in Appendix 1.

4.1.2 Positional data shall be classified as: surveyed points (e.g. navigation aid positions, runway threshold); calculated points (mathematical calculations from the known surveyed points of points in space, fixes); or 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 service (AIS) in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum.

4.1.4 Geographical coordinates that 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 Appendix 1 shall be identified.

4.1.5 In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions specified in Appendix 2 shall also be published.

### **4.2 Metadata Requirements**

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

- a) the names of the organizations or entities performing any action of originating, transmitting or manipulating the data;
- b) the action performed; and
- c) the date and time the action was performed.

*Note. — 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 provided in accordance with the resolution requirements contained in Appendix 1.

5.1.2 Geographical coordinates whose accuracy does not meet the requirements specified in Appendix 1 shall be identified.

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 shall 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 2. 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 2, 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 5.3.3.1) is provided, the following sections of the AIP may be omitted and a reference to the data set availability shall be provided:

- a) GEN 2.5 List of radio navigation aids;
- b) ENR 2.1 FIR, UIR, TMA and CTA;
- c) ENR 3.1 Conventional navigation routes;
- d) ENR 3.2 Area navigation routes;
- e) ENR 3.5 Other routes;

- f) ENR 3.6 En-route holding;
- g) ENR 4.1 Radio navigation aids — en-route;
- h) ENR 4.2 Special navigation systems;
- i) ENR 4.4 Name-code designators for significant points;
- j) ENR 4.5 Aeronautical ground lights – en-route;
- k) ENR 5.1 Prohibited, restricted and danger areas;
- l) ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ);
- m) ENR 5.3.1 Other activities of a dangerous nature;
- n) ENR 5.3.2 Other potential hazards;
- o) ENR 5.5 Aerial sporting and recreational activities;
- p) \*\*\*\* AD 2.17 Air traffic services airspace;
- q) \*\*\*\* AD 2.19 Radio navigation and landing aids;
- r) \*\*\*\* AD 3.16 Air traffic services airspace; and
- s) \*\*\*\* AD 3.18 Radio navigation and landing aids

5.2.1.1.4 When the Obstacle Data Set (as specified in 5.3.3.2.2) is provided, the following sections of the AIP may be omitted and a reference to the data set availability shall be provided:

- a) ENR 5.4 Air navigation obstacles;
- b) \*\*\*\* AD 2.10 Aerodrome obstacles; and
- c) \*\*\*\* AD 3.10 Heliport obstacles.

#### 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 jointly provide an AIP, these States shall be clearly indicated.

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

*Note. — 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).*

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

5.2.1.2.5 Each AIP shall be dated.

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

5.2.1.2.6 Charts, maps or diagrams should be used to complement or as a substitute for the tabulations or text of AIP.

*Note. — Where appropriate, charts produced in conformity with Annex 4 may be used to fulfil this requirement.*

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 lower-case 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:

- a) the latitude should be given first;
- b) symbols for degrees, minutes or seconds should be omitted;
- c) two digits should always be used in expressing values of less than 10 degrees of latitude;
- d) three digits should always be used in expressing values of less than 100 degrees of longitude; and
- e) the letters N, S, E, W should be used to indicate the cardinal points of the compass to the latitude and longitude as appropriate.

5.2.1.2.10 When describing periods of activity, availability or operation, the applicable days and times shall be specified.

5.2.1.2.11 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 Rwanda Civil Aviation Regulations, Part 38.

5.2.1.2.12 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 RCATS —*Aeronautical Charts*, 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 Operationally significant changes to the AIP shall be published in accordance with Aeronautical Information Regulation and Control (AIRAC) procedures and shall be clearly identified by the acronym AIRAC.

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 included in the AIP, Part 1 — General (GEN).

5.2.1.3.3 New or revised information contained in the AIP shall be identified.

5.2.1.3.4 Each AIP Amendment shall be allocated a serial number, which shall be consecutive and based on the calendar year.

5.2.1.3.5 Each AIP Amendment shall contain a publication date.

5.2.1.3.6 Each AIRAC AIP Amendment shall contain an effective date.

5.2.1.3.6.1 When an effective time other than 0000 UTC is used, the effective time shall also be indicated.

5.2.1.3.7 When an AIP Amendment is issued, it shall include references to the serial number of the AIP Supplement or the series and number of the NOTAM which has been incorporated into the amendment.

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

5.2.1.3.9 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.*

5.2.1.4.1 Each AIP Supplement shall be allocated a serial number which shall be consecutive and based on the calendar year.

*Note. — Guidance material on the use of AIP Supplements together with examples of such use is contained in Doc 8126.*

5.2.1.4.2 Each AIP Supplement shall be provided on distinctive pages allowing for easy identification from the regular AIP content.

5.2.1.4.3 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.

5.2.1.4.4 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 by 5.2.5.3 and with distribution as for the AIP Supplements.

5.2.1.4.5 Each AIP Supplement page shall show a publication date.

5.2.1.4.6 Each AIRAC AIP Supplement page shall show a publication date and an effective date.

### 5.2.2 Aeronautical Information Circulars (AIC)

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

- a) forecasts of important changes in the air navigation procedures, services and facilities provided;
- b) forecasts of implementation of new navigation systems;

- c) significant information arising from aircraft accident/incident investigation which has a bearing on flight safety;
- d) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;
- e) advice on medical matters of special interest to pilots;
- f) warnings to pilots concerning the avoidance of physical hazards;
- g) effect of certain weather phenomena on aircraft operations;
- h) information on new hazards affecting aircraft handling techniques;
- i) regulations relating to the carriage of restricted articles by air;
- j) reference to the requirements of, and publication of changes in, national legislation;
- k) flight crew licensing arrangements;
- l) training of aviation personnel;
- m) application of, or exemption from, requirements in national legislation;
- n) advice on the use and maintenance of specific types of equipment;
- o) actual or planned availability of new or revised editions of aeronautical charts;
- p) carriage of communication equipment;
- q) explanatory information relating to noise abatement;
- r) airworthiness directives;
- s) changes in NOTAM series or distribution, new editions of AIP or major changes in their contents, coverage or format;
- t) advance information on the snow plan (see 5.2.2.2);
- u) other information of a similar nature.

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, slush, ice or frost 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 list 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.

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

*Note. — 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.*

5.2.2.7 In the event that AIC are provided in more than one series, each series shall be separately identified by a letter (e.g. A 2/02, B 4/02).

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

5.2.2.9 A checklist of AIC provided internationally shall be included in the NOTAM checklist.

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

### **5.2.3 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 loose-leaf 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 identity of the AIP;
- b) the territory covered and subdivisions when necessary;
- c) the identification of the issuing State and producing organization (authority); and
- d) page numbers/chart titles.

5.2.3.1.3 The issuing State or the joint issuing States shall be clearly indicated on the cover and in the table of contents.

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

5.2.3.1.5 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.

5.2.3.1.6 Each AIP Amendment page shall contain a publication date or, when applicable, an effective date. The cover sheet shall contain the publication date and, when applicable, an effective date.

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

- a) preface;
- b) record of AIP Amendments;
- c) record of AIP Supplements;
- d) checklist of AIP pages; and
- e) list of current hand amendments.

5.2.3.1.8 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.

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

- a) an identification of the part of the AIP;
- b) the section; and
- c) the 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).

5.2.3.1.10 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.

5.2.3.1.11 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.

5.2.3.1.12 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.

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

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

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

*Note. — 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.*

5.2.3.1.16 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 AIC should be colour coded by subject where there are sufficient circulars in force to warrant such identification, e.g.:

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

## 5.2.4 Electronic AIP (eAIP)

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

5.2.4.1 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.

5.2.4.2 New or revised information shall be identified either by an annotation against it in the margin or by a mechanism that allows comparing the new/revised information with the previous information.

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).*

5.2.4.4 Electronic aeronautical charts shall be provided based on digital databases and the use of geographic information systems.

## **5.2.5 NOTAM**

### **5.2.5.1 General specifications**

5.2.5.1.1 Except as otherwise provided in 5.2.5.1.4 and 5.2.5.1.5, each NOTAM shall contain the information in the order shown in the NOTAM Format in Appendix 3.

*Note.* — *Detailed guidance material covering NOTAM, SNOWTAM, ASHTAM and pre-flight information bulletin (PIB) production is contained in Doc 8126.*

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

*Note 1.*— *The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO abbreviations, are contained in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).*

*Note 2.*— *Additional procedures covering the reporting of runway surface conditions are contained in the Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes, Doc 9981).*

5.2.5.1.3 All NOTAM shall be issued in the English language.

*Note.* — *If necessary for domestic users, NOTAM may additionally be issued in a national language.*

5.2.5.1.4 Information concerning snow, slush, ice, frost, standing water, or water associated with snow, slush, ice or frost on the movement area shall be disseminated by means of a SNOWTAM, and shall contain the information in the order shown in the SNOWTAM Format in Appendix 4.

*Note. — The origin and order of the information is a result of assessment processes and procedures prescribed in the PANS-Aerodromes (Doc 9981).*

5.2.5.1.5 Information concerning an operationally significant change in volcanic activity, 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 5.

5.2.5.1.6 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.

5.2.5.1.7 When a NOTAM is issued which cancels or replaces a previous NOTAM, the series and number of the previous NOTAM shall be indicated.

5.2.5.1.7.1 The series, location indicator and subject of both NOTAM shall be the same.

5.2.5.1.8 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 material concerning the combination of a subject and a condition of the subject in accordance with the NOTAM Selection Criteria is contained in 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 information 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 ISO basic Latin alphabet.

#### 5.2.5.2 NOTAM number and series allocation

5.2.5.2.1 The international 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 S and T shall not 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 are issued in both English and a national language, the NOTAM series shall be organized such that the national language series is equivalent to the English language series in terms of content.

5.2.5.2.4.1 Whenever possible, the national language series should have the same numbering as the English language series to facilitate comparison.

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

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

#### 5.2.5.3 NOTAM checklist

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

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

5.2.5.3.2 One NOTAM checklist shall be issued for each series.

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

5.2.5.3.4 A NOTAM checklist shall have the same distribution as the actual message series to which it refers and shall be clearly identified as a checklist.

## 5.3 Digital Data

### 5.3.1 General provisions

5.3.1.1 To facilitate and support the use of exchange of digital data sets between data providers and data users, the ISO 19100 series of standards for geographic information should be used as a reference framework.

*Note. — Guidance material concerning the use of the ISO 19100 series of standards is contained in Doc 8126.*

5.3.1.2 A description of available digital data sets shall be provided in the form of data product specifications 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 outlines the specifications for geographic data products. 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 The content and structure of digital 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.*

5.3.1.4 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 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 4.2 and 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 5.3.1.5; 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).*

5.3.1.7 Charts, maps or diagrams should be used to complement digital data sets.

5.3.1.8 When provided, the digital data sets specified in RCARs Part 25, Regulation 25.235 shall be made available through information services.

### **5.3.2 Metadata**

Each data set shall include the following minimum set of metadata:

- a) the names of the organization or entities providing the data set;
- b) the date and time when the data set was provided;
- c) period of validity of the data set; and
- d) any limitations with regard to the use of the data set.

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

### 5.3.3 Data sets

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

#### 5.3.3.1 AIP data set

*Note. — The purpose of the AIP data set is to support the 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 being used in digital format by service providers, ATC and instrument flight rules/visual flight rules (IFR/VFR) airspace users.*

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

- a) air traffic services (ATS) airspace (type, name, lateral limits, vertical limits, class of airspace);
- b) special activity airspace (type, name, lateral limits, vertical limits, restriction, activation);
- c) ATS route and other route (designator, flight rules);
- d) route segment (navigation specification, from point, to point, track, length, upper limit, lower limit, minimum en-route altitude (MEA), minimum obstacle clearance altitude (MOCA), direction of cruising level, required navigation performance);
- e) waypoint – en-route (identification, location, formation);
- f) aerodrome/heliport (ICAO location indicator, name, designator IATA, served city, certified ICAO, certification date, certification expiration date, control type, field elevation, reference temperature, magnetic variation, reference point);
- g) runway (designator, nominal length, nominal width, surface type, strength);
- h) runway direction (designator, true bearing, threshold, take off run available (TORA), take-off distance available (TODA), accelerate-stop distance available (ASDA), landing distance available (LDA));
- i) final approach and take-off (FATO) (designation, length, width, threshold point);
- j) touchdown and left-off (TLOF) (designator, centre point, length, width, surface type);

- k) radio navigation aid (type, identification, name, aerodrome/heliport served, hours of operation, magnetic variation, frequency/channel, position, elevation, magnetic bearing, true bearing, zero bearing direction);

*Note 1.— The description of the data subjects, together with their properties, data type and applicable data quality requirements, is provided in Appendix 1.*

*Note 2. — The AIP data set includes relevant AIP Amendments and AIP Supplements.*

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

5.3.3.1.3 An AIP data set should be provided covering the extent of information as provided in the AIP.

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

#### 5.3.3.2 Terrain and obstacle data sets

*Note. — Terrain and obstacle data is 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 training/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.*

---

#### 5.3.3.2.1 *Terrain data set*

5.3.3.2.1.1 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.*

5.3.3.2.1.2 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, and permanent ice and snow, and exclude obstacles. 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”.

5.3.3.2.1.3 In terrain data sets, only one feature type, i.e. terrain, shall be provided. Feature attributes describing terrain shall be those listed in Appendix 6, Table A6-1. The terrain feature attributes listed in Appendix 6, Table A6-1 represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain data set.

5.3.3.2.1.4 Terrain data for each area shall conform to the applicable numerical requirements in Appendix 1.

5.3.3.2.1.5 For aerodromes regularly used by international civil aviation, additional terrain data shall be provided within Area 2 as follows:

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

5.3.3.2.1.6 For aerodromes regularly used by international civil aviation, terrain data shall be provided for Area 3.

5.3.3.2.1.7 Where additional terrain data is collected to meet other aeronautical requirements, the terrain data sets shall be expanded to include this additional data.

#### 5.3.3.2.2 *Obstacle data set*

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

5.3.3.2.2.2 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 6, Table A6-2.

*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 6, Table A6-2 as optional attributes. If these types of obstacles are to be provided in the data set, appropriate attributes describing such obstacles are also required.*

5.3.3.2.2.3 Obstacle data for each area shall conform to the applicable numerical requirements contained in Appendix 1.

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

- a) Areas 2a, 2b, 2c, 2d;
- b) the take-off flight path area; and
- c) 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 6, Table A6-2. Guidance on appropriate obstacles for this chart is given in the Aeronautical Chart Manual (Doc 8697).*

5.3.3.2.3 For aerodromes regularly used by international civil aviation, obstacle data shall be provided for Areas 2b, 2c and 2d for obstacles that penetrate the relevant obstacle data collection surface specified as follows:

- a) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side. The Area 2b obstacle collection surface has a 1.2 per cent slope extending from the ends of Area 2a at the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;
- b) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2 per cent slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c has the elevation of the point of Area 2a at which it commences; and
- c) Area 2d: an area outside Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground; except that data need not be collected for

obstacles less than a height of 3 m above ground in Area 2b and less than a height of 15 m above ground in Area 2c.

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

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

### 5.3.3.3 Aerodrome mapping data sets

*Note 1. — Aerodrome mapping data includes 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 (e.g. 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 2. — Aerodrome mapping data is organized and arranged in aerodrome mapping databases (AMDBs) for ease of electronic storage and usage by appropriate applications.*

*Note 3.— The content of the aerodrome mapping data sets is defined in Radio Technical Commission for Aeronautics (RTCA) Document DO 272D/European Organization for Civil Aviation Equipment (EUROCAE) Document ED 99 — User Requirements for Aerodrome Mapping Information.*

*Note 4.— Metadata elements applicable to aerodrome mapping data are contained in RTCA DO-291B/EUROCAE ED-119B — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data.*

#### 5.3.3.3.1 Aerodrome mapping data — requirements for provision

Aerodrome mapping data shall 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 Appendix 1.*

*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.— The content of the aerodrome mapping data sets is defined in RTCA DO 272D/EUROCAE ED-99D.*

5.3.3.3.2 Aerodrome mapping data sets shall be made available for aerodromes regularly used by international civil aviation.

#### 5.3.3.4 Instrument flight procedure data set

*Note. — The purpose of the instrument flight procedure data set is to support the 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 being used in digital format by service providers, ATC and IFR/VFR airspace users.*

5.3.3.4.1 The instrument flight procedure data set shall include data about the following data subjects, with the properties indicated in brackets being included as a minimum (if applicable):

- a) procedure (all properties);
- b) procedure segment (all properties);
- c) final approach segment (all properties);
- d) procedure fix (all properties);
- e) procedure holding (all properties); and
- f) helicopter procedure (all properties).

*Note.* — The description of the data subjects, together with their properties, data type and applicable data quality requirements, is provided in Appendix 1.

5.3.3.4.2 The instrument flight procedure data set should also cover the data publication requirements contained in the *Procedures for Air Navigation Services — Aircraft Operations* (PANS-OPS, Doc 8168), Volume II — *Construction of Visual and the Instruments Flight Procedures*.

## 5.4 Distribution Services

### 5.4.1 General

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

- a) *Physical distribution.* The means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package (e.g. postal services); or
- b) *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.

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

*Note.*— Further guidance on digital data set distribution can be found in the Manual on System-wide Information Management (SWIM) Concept (Doc 10039).

5.4.1.3 A checklist of the available data sets, including their effective and publication dates, shall be made available to allow the users to ensure that current data is being used.

5.4.1.4 The checklist of the data sets shall be made available through the same distribution mechanism as is used for the data sets.

5.4.1.5 Global communication networks such as the Internet shall, whenever practicable, be employed for the provision of aeronautical information products.

5.4.1.6 When provided, the digital data sets specified in RCARs, Part 25, regulation 25.235 shall be made available through information services.

5.4.1.7 A data set information service shall provide the ability to query and retrieve selected elements of the digital data sets specified in RCARs, Part 25, regulation 25.235.

5.4.1.8 A data set information service shall provide the option to subscribe to notifications on data set updates.

#### **5.4.2 NOTAM distribution**

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

*Note. — Arrangements may be made for direct exchange of SNOWTAM (see Appendix 4) between aerodromes/heliports.*

5.4.2.2 The international exchange of ASHTAM (see 5.2.5.1.6), 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 Secure Aviation Data Information Service (SADIS) and the World Area Forecast System (WAFS) Internet file service (WIFS), and shall take account of the requirements of long-range operations.

5.4.2.3 The exchange of NOTAM between international NOTAM offices and between the international NOTAM offices and multinational NOTAM processing units shall, as far as practicable, cover the needs of operations personnel including flight crew members.

5.4.2.4 A predetermined distribution system for NOTAM transmitted on the AFS in accordance with Annex 15, 6.3.2.3 shall be used whenever possible, subject to the requirements of 5.4.2.3.

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

5.4.2.6 Selective distribution lists shall be used when practicable.

### **5.5 Pre-Flight Information Services**

5.5.1 Geographic coverage for pre-flight information services should be determined and periodically reviewed. In general, the coverage zone should be limited to the flight information region (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.

5.5.2 Although NOTAM with purpose “M” are 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.

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 AIS 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 PANS-ABC (Doc 8400) and 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 data and aeronautical information in accordance with 5.5.3 and meteorological information in accordance with 9.4.1 of Annex 3 — *Meteorological Service for International Air Navigation*, should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 2.1.1 c) of Annex 15 and the relevant meteorological service provider.

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) of Annex 15 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 9.4.3 of Annex 3.*

## **Chapter 6 AERONAUTICAL INFORMATION UPDATES**

### **6.1 Aeronautical Information Product Updates**

6.1.1 The same update cycle shall be applied to the Aeronautical Information Publication (AIP) and the digital data sets in order to ensure the consistency of the data items that appear in multiple aeronautical information products.

#### **6.1.2 Specifications for AIP amendments**

6.1.2.1 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).

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

6.1.2.3 Recourse to hand amendments or annotations shall be kept to a minimum.

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

#### **6.1.3 Specifications for AIP Supplements**

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).

#### **6.1.4 Specifications for NOTAM**

6.1.4.1 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.

6.1.4.2 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.

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

6.1.4.3.1 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.*

6.1.4.4 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.

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

6.1.4.6 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.

6.1.4.7 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a so-called "Trigger NOTAM" shall be originated giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement.

6.1.4.7.1 The Trigger NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.

6.1.4.7.2 In the case of an AIP Supplement, the Trigger NOTAM shall remain valid for a period of fourteen days.

6.1.4.7.3 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.

6.1.4.7.4 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 Doc 8126.*

## **6.1.5 Specifications for digital data updates**

6.1.5.1 The update interval for the digital data sets shall be specified in the data product specification.

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

6.2.1 Whenever major changes are planned and where advance notice is desirable and practicable, information shall be made available by the AIS so as to reach recipients at least 56 days in advance of the effective date. This shall be applied to the establishment of, and premeditated major changes in, the circumstances listed below, and other major changes if deemed necessary:

- a) new aerodromes for international instrument flight rules (IFR) operations;
- b) new runways for IFR operations at international aerodromes;
- c) design and structure of the ATS route network;
- d) design and structure of a set of terminal procedures (including change of procedure bearings due to magnetic variation change);
- e) circumstances listed in RCARs, Part 25, Regulation 25.290(a) if the entire State or any significant portion thereof is affected or if cross-border coordination is required.

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

6.2.2 When made available as a completely reissued data set, the differences from the previously issued complete data set shall be indicated.

6.2.3 When temporary changes of short duration are made available as digital data (digital NOTAM), they shall use the same aeronautical information model as the complete data set.

6.2.4 A data set information service shall provide the ability to query and retrieve selected elements of the digital data sets specified in RCARs Part 25, Regulation 25.235.

*Note. — Guidance material on how to query digital data sets is contained in the Aeronautical Information Services Manual (Doc 8126), Part IV.*

6.2.5.8 A data set information service shall provide the option to subscribe to notifications on data set updates.

## Appendix 1. AERONAUTICAL DATA CATALOGUE

Note 1. — The Aeronautical Data Catalogue is available as attachment to this appendix.

Note 2. — The Aeronautical Data Catalogue is a general description of the aeronautical Information management (AIM) data scope and consolidates all data that can be collected and maintained by the aeronautical information service (AIS). It provides a reference for aeronautical data origination and publication requirements.

Note 3. — The Aeronautical Data Catalogue provides a means for States to facilitate the identification of the organizations and authorities responsible for the origination of the aeronautical data and aeronautical information. It also provides a common list of terms and facilitates the formal arrangements between data originators and the AIS. It includes data quality requirements applicable from origination through to publication.

Note 4. — The Aeronautical Data Catalogue contains the aeronautical data subjects, properties and sub-properties organized in:

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Table A1-1  | Aerodrome data;                                                           |
| Table A1-2  | Airspace data;                                                            |
| Table A1-3  | ATS and other 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;                                                          |
| Table A1-8  | Terrain data;                                                             |
| Table A1-9  | Data types; and                                                           |
| Table A1-10 | Information about national and local regulation, services and procedures. |

Note 5. — The Aeronautical Data Catalogue provides detailed descriptions of all subjects, properties and sub-properties, the data quality requirements and the data types.

Note 6. — The data types describe the nature of the property and sub-property and specify the data elements to be collected.

Note 7. — The tables of the Aeronautical Data Catalogue are composed of the following columns:

- (1) Subject for which data can be collected.

(2)(3) Property is an identifiable characteristic of a subject which can be further defined into sub-properties. 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 are based on a 95 per cent confidence level. For those fixes and points that are serving a dual purpose, e.g. holding point and missed approach point, the higher accuracy applies. Accuracy requirements for obstacle and terrain data are based on a 90 per cent confidence level.

(8) Integrity classification.

(9) Origination type. Positional data is identified as surveyed, calculated or declared.

(10) Publication resolution. The publication resolutions for geographical position data (latitude and longitude) are applicable to coordinates formatted in degrees, minutes and seconds. When a different format is used (such as degrees with decimals for digital data sets) or when the location is significantly further to the north/south, the publication resolution needs to be commensurate with the accuracy requirements.

(11) Chart resolution

Note 8.— The Aeronautical Data Catalogue contains quality requirements for aeronautical data as originally provided in: RCATS — Aeronautical Charts, Appendix 6; RCATS — Air Traffic Services, Appendix 5; RCATS — ADO, Volume I — Aerodromes Designs and Operations, Appendix 4 and Volume II — Heliports, Appendix 1; Annex 15 — Aeronautical Information Services, Appendices 7 and 8, and the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II — Construction of Visual and Instrument Flight Procedures. The framework of the Aeronautical Data Catalogue is designed to adapt to future quality requirements for the remaining aeronautical data properties and sub-properties.

Table S 1-1 Aerodrome/Heliport data

| Subject              | Property                  | Sub-Property            | Type      | Description                                                                                                                                                                                      | Note   | 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. |        |          |           |           | –         | –          |
|                      | Designator                |                         |           | Designator of the aerodrome / heliport                                                                                                                                                           |        |          |           |           |           |            |
|                      |                           | ICAO location indicator | Text      | The four letter ICAO location indicator of the aerodrome/heliport, as listed in ICAO DOC 7910 (Location Indicators).                                                                             | if any |          |           |           |           |            |
|                      |                           | 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).                                          | if any |          |           |           |           |            |
|                      |                           | Other                   | Text      | A locally defined airport identifier, if other than an ICAO Location Indicator                                                                                                                   |        |          |           |           |           |            |
|                      | Name                      |                         | Text      | The primary official name of an aerodrome as designated by an appropriate authority.                                                                                                             |        |          |           |           |           |            |
|                      | Served city               |                         | Text      | The full name of the city or town the aerodrome/heliport is serving                                                                                                                              |        |          |           |           |           |            |
|                      | Type of traffic permitted |                         |           |                                                                                                                                                                                                  |        |          |           |           |           |            |
|                      |                           | International_national  | Code list | Indication if international and/or national flights are permitted at the aerodrome/heliport                                                                                                      |        |          |           |           |           |            |

|                               |                |           |                                                                                                                                 |  |       |           |          |            |             |
|-------------------------------|----------------|-----------|---------------------------------------------------------------------------------------------------------------------------------|--|-------|-----------|----------|------------|-------------|
|                               | IFR_VFR        | Code list | Indication if IFR and/or VFR flights are permitted at the aerodrome/heliport                                                    |  |       |           |          |            |             |
|                               | Sched_nonsched | Code list | Indication if scheduled and/or nonscheduled flights are permitted at the aerodrome/heliport                                     |  |       |           |          |            |             |
|                               | Civil_military | Code list | Indication if civil commercial aviation and/or general aviation and/or military flights are permitted at the aerodrome/heliport |  |       |           |          |            |             |
|                               | Restricted_use | Text      | Indication if an aerodrome or heliport is not open for the public (Only for the use of the owners).                             |  |       |           |          |            |             |
| Heliport type                 |                | Text      | The type of the heliport as mentioned in Annex 14 Volume II (Surface-level, elevated, shipboard or helideck)                    |  |       |           |          |            |             |
| Control type                  |                | Text      | Indication if an aerodrome is under civil control, military control or joint control                                            |  |       |           |          |            |             |
| Certified ICAO                |                | Text      | Indication if airport is/is not certified according to the ICAO rules                                                           |  |       |           |          |            |             |
| Certification date            |                | Date      | The date when the airport certification has been issued by the supervising authority.                                           |  |       |           |          |            |             |
| Certification expiration date |                | Date      | The date when the airport certification will become invalid.                                                                    |  |       |           |          |            |             |
| Field elevation               |                |           |                                                                                                                                 |  |       |           |          |            |             |
|                               | Elevation      | Elevation | The vertical distance above Mean Sea Level (MSL) of the highest point of the landing area.                                      |  | 0.5 m | essential | surveyed | 1m or 1 ft | 1 m or 1 ft |

|                       | Geoid undulation | Height | Geoid undulation at the aerodrome/ heliport elevation position                                                                                                                          | where appropriate | 0.5 m     | essential | surveyed             | 1 m or 1 ft | 1 m or 1 ft |
|-----------------------|------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|-----------|----------------------|-------------|-------------|
| Reference temperature |                  | 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) |                   |           |           |                      |             |             |
| 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.                                                               |                   | 5 degrees |           |                      |             |             |
| Magnetic variation    |                  |        | The angular difference between True North and Magnetic North.                                                                                                                           |                   |           |           |                      |             |             |
|                       | Angle            | Angle  | The magnetic variation angle value                                                                                                                                                      |                   | 1 degree  | essential | surveyed             | 1 degree    | 1 degree    |
|                       | Date             | Date   | The date on which the magnetic variation had the corresponding value.                                                                                                                   |                   |           |           |                      |             |             |
|                       | Annual change    | Value  | The annual rate of change of the magnetic variation.                                                                                                                                    |                   |           |           |                      |             |             |
| Reference point       |                  |        | The designated geographical location of an aerodrome.                                                                                                                                   |                   |           |           |                      |             |             |
|                       | Position         | Point  | Geographical location of aerodrome reference point.                                                                                                                                     |                   | 30 m      | routine   | surveyed/ calculated | 1 sec       | 1 sec       |
|                       | Site             | Text   | The location of the reference point on the aerodrome.                                                                                                                                   |                   |           |           |                      |             |             |
|                       | Direction        | Text   | Direction of aerodrome reference point from centre of the city or town which the aerodrome serves                                                                                       |                   |           |           |                      |             |             |

|                             |                    |          |          |                                                                                                               |        |  |  |  |  |  |
|-----------------------------|--------------------|----------|----------|---------------------------------------------------------------------------------------------------------------|--------|--|--|--|--|--|
|                             |                    | Distance | Distance | Distance of aerodrome reference point from centre of the city or town which the aerodrome serves              |        |  |  |  |  |  |
| Landing direction indicator |                    |          |          | A device to indicate visually the direction currently designated for landing and for take-off.                |        |  |  |  |  |  |
|                             | Location           |          | Text     | Location of landing direction indicator                                                                       |        |  |  |  |  |  |
|                             | Lighting           |          | Text     | Lighting of landing direction indicator                                                                       | if any |  |  |  |  |  |
| Secondary Power Supply      |                    |          |          |                                                                                                               |        |  |  |  |  |  |
|                             | Characteristics    |          | Text     | The description of the secondary power supply                                                                 |        |  |  |  |  |  |
|                             | Switch-over time   |          | Value    | Secondary power supply switch-over time                                                                       |        |  |  |  |  |  |
| Anemometer                  |                    |          |          | Device used for measuring wind speed                                                                          |        |  |  |  |  |  |
|                             | Location           |          | Text     | Location of anemometer                                                                                        |        |  |  |  |  |  |
|                             | Lighting           |          | Text     | Lighting of anemometer                                                                                        | if any |  |  |  |  |  |
| ABN / IBN                   |                    |          |          | Aerodrome beacon / identification beacon used to indicate the location of an aerodrome/heliport from the air. |        |  |  |  |  |  |
|                             | Location           |          | Text     | Location of aerodrome/heliport beacon/identification beacon                                                   | if any |  |  |  |  |  |
|                             | Characteristics    |          | Text     | Description of aerodrome/heliport beacon/identification beacon                                                |        |  |  |  |  |  |
|                             | Hours of operation |          | Schedule | Hours of operation of aerodrome/heliport beacon/identification beacon                                         |        |  |  |  |  |  |

|                          |            |  |         |                                                                                                                                                                            |  |  |  |  |  |  |
|--------------------------|------------|--|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Wind Direction Indicator |            |  |         |                                                                                                                                                                            |  |  |  |  |  |  |
|                          | Location   |  | Text    | Location of wind direction indicator                                                                                                                                       |  |  |  |  |  |  |
|                          | Lighting   |  | Text    | Lighting of wind direction indicator                                                                                                                                       |  |  |  |  |  |  |
| RVR observation site     |            |  |         | The observation site of Runway Visual Range.                                                                                                                               |  |  |  |  |  |  |
|                          | Position   |  | Point   | Geographical location of runway visual range (RVR) observation sites                                                                                                       |  |  |  |  |  |  |
| Frequency Area           |            |  |         | Designated part of a surface movement area where a specific frequency is required by air traffic control or ground control.                                                |  |  |  |  |  |  |
|                          | Station    |  | Text    | Name of the station providing the service                                                                                                                                  |  |  |  |  |  |  |
|                          | Frequency  |  | Value   | Frequency of the station providing the service                                                                                                                             |  |  |  |  |  |  |
|                          | Boundary   |  | Polygon | Area boundary of the frequency area                                                                                                                                        |  |  |  |  |  |  |
| Hot spot                 |            |  |         | 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. |  |  |  |  |  |  |
|                          | Identifier |  | Text    | The identifier of the hot spot                                                                                                                                             |  |  |  |  |  |  |
|                          | Annotation |  | Text    | Additional information about the hot spot                                                                                                                                  |  |  |  |  |  |  |
|                          | Geometry   |  | Polygon | The geographical area of the hot spot                                                                                                                                      |  |  |  |  |  |  |

| Subject | Property           | Sub-Property     | Type      | Description                                                                                                                                                                                                                                                     | Note                            | Accuracy | Integrity | Orig Type | Pub. Res.   | Chart Res. |
|---------|--------------------|------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------|-----------|-----------|-------------|------------|
| 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/heliport. E.g. 09/27, 02R/20L, RWY 1.                                                                                                                                   |                                 |          |           |           |             |            |
|         | Nominal length     |                  | Distance  | The declared longitudinal extent of the runway for operational (performance) calculations.                                                                                                                                                                      |                                 | 1 m      | critical  | surveyed  | 1 m or 1 ft | 1 m        |
|         | Nominal width      |                  | Distance  | The declared transversal extent of the runway for operational (performance) calculations.                                                                                                                                                                       |                                 | 1 m      | 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                                                    | Definition from Annex 4 3.8.4.2 | 1 m      | critical  | surveyed  |             |            |
|         |                    | Elevation        | Elevation | The elevation of the corresponding centre line point. (See Annex 14 I 2.3.2: --- for non-precision approaches ... any significant high and low intermediate points along the runway shall be measured to the accuracy of one-half metre or foot...) See Note 3) |                                 | 0.25 m   | 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                                                                                                                                                                  |  | 0.5 m | 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                                                                                                                                           |  |       |           |          |           |       |
| Strength      |                    |           |                                                                                                                                                                                                                    |  |       |           |          |           |       |
|               | PCR                | Text      | Pavement classification rating                                                                                                                                                                                     |  |       |           |          |           |       |
|               | Pavement type      | Text      | Pavement type for aircraft classification rating — pavement classification rating (ACR-PCR) determination                                                                                                          |  |       |           |          |           |       |
|               | Subgrade category  | Text      | Subgrade strength category                                                                                                                                                                                         |  |       |           |          |           |       |
|               | Allowable pressure | Text      | Maximum allowable tire pressure category or maximum allowable tire pressure value                                                                                                                                  |  |       |           |          |           |       |
|               | Evaluation method  | Text      | The evaluation method used                                                                                                                                                                                         |  |       |           |          |           |       |
| 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.                                                                                                                                                                       |  |       |           |          |           |       |
|               | Width              | Distance  | The transversal extent of the runway strip                                                                                                                                                                         |  |       |           |          |           |       |
|               | Surface type       | Text      | The surface type of the runway strip                                                                                                                                                                               |  |       |           |          |           |       |
| 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  | The geographical location of the shoulders                                       |               |    |           |          |             |  |
|                     | Surface type | Text     | The surface type of the shoulder                                                 |               |    |           |          |             |  |
|                     | Width        | Distance | The width of the runway shoulder                                                 |               | 1m | essential | surveyed | 1 m or 1 ft |  |
| Blastpad            |              |          | The area provided to reduce the erosive effects of jet blast and propeller wash. |               |    |           |          |             |  |
|                     | Geometry     | Polygon  | The geographical location of the blastpad                                        |               |    |           |          |             |  |
| Obstacle free zone  |              | Text     | Existence of an obstacle-free zone for a precision approach runway category I    | when provided |    |           |          |             |  |
| RWYmarking          |              |          |                                                                                  |               |    |           |          |             |  |
|                     | Type         | Text     | Type of runway marking                                                           |               |    |           |          |             |  |
|                     | Description  | Text     | Description of the runway markings                                               |               |    |           |          |             |  |
|                     | Geometry     | Polygon  | The geographical location of the runway marking                                  |               |    |           |          |             |  |
| RWY center line LGT |              |          |                                                                                  |               |    |           |          |             |  |
|                     | Length       | Distance | The longitudinal extent of the runway centre line lights                         |               |    |           |          |             |  |
|                     | Spacing      | Distance | Spacing of runway centre line lights                                             |               |    |           |          |             |  |
|                     | Colour       | Text     | Colour of runway centre line lights                                              |               |    |           |          |             |  |
|                     | Intensity    | Text     | Intensity of runway centre line lights                                           |               |    |           |          |             |  |
|                     | Position     | Point    | Geographical location of each individual light of the runway center line lights  |               |    |           |          |             |  |
| RWY Edge LGT        |              |          |                                                                                  |               |    |           |          |             |  |
|                     | Length       | Distance | The longitudinal extent of the runway edge lights                                |               |    |           |          |             |  |
|                     | Spacing      | Distance | Spacing of the runway edge lights                                                |               |    |           |          |             |  |
|                     | Colour       | Text     | Colour of runway edge lights                                                     |               |    |           |          |             |  |
|                     | Intensity    | Text     | Intensity of runway edge lights                                                  |               |    |           |          |             |  |
|                     | Position     | Point    | Geographical location of each                                                    |               |    |           |          |             |  |

|                  |                  |           |                                                                                                                                                                                                                                                                                                |  |             |          |          |              |          |
|------------------|------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|----------|----------|--------------|----------|
|                  |                  |           | individual light of the runway edge lights                                                                                                                                                                                                                                                     |  |             |          |          |              |          |
| Reference Code   |                  |           | The intent of the reference code is to provide a simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome |  |             |          |          |              |          |
|                  | Number           | Code list | A number based on the aeroplane reference field length                                                                                                                                                                                                                                         |  |             |          |          |              |          |
|                  | Letter           | Code list | A letter based on the aeroplane wingspan and outer main gear wheel span                                                                                                                                                                                                                        |  |             |          |          |              |          |
| Restriction      |                  | Text      | Description of restrictions imposed on runway                                                                                                                                                                                                                                                  |  |             |          |          |              |          |
| Runway Direction |                  |           |                                                                                                                                                                                                                                                                                                |  |             |          |          |              |          |
| Designator       |                  | Text      | The full textual designator of the landing and take-off direction. Examples: 27, 35L, 01R.                                                                                                                                                                                                     |  |             |          |          |              |          |
| True bearing     |                  | Bearing   | The true bearing of the runway.                                                                                                                                                                                                                                                                |  | 1/100 deg   | Routine  | surveyed | 1/100 degree | 1 degree |
| Type             |                  | Text      | Type of runway: precision (CAT I, II, III) / non-precision / non-instrument                                                                                                                                                                                                                    |  |             |          |          |              |          |
| Threshold        |                  |           | The beginning of that portion of the runway usable for landing.                                                                                                                                                                                                                                |  |             |          |          |              |          |
|                  | Position         | Point     | Geographical location for runway threshold                                                                                                                                                                                                                                                     |  | 1 m         | critical | surveyed | 1/100 sec    | 1 sec    |
|                  | Elevation        | Elevation | Elevation of the runway threshold                                                                                                                                                                                                                                                              |  | See Note 1) |          |          |              |          |
|                  | Geoid undulation | Height    | WGS-84 Geoid undulation at runway threshold position                                                                                                                                                                                                                                           |  | 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.                                                                                                                                                                |  |             |          |          |              |          |

|                         | Displacement      | Distance  | Distance of displaced threshold                                                                                                                                                        | If displaced threshold           | 1 m            | routine  | surveyed | 1m or 1ft |       |
|-------------------------|-------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------|----------|----------|-----------|-------|
| Runway end              |                   |           | Runway end (flight path alignment point)                                                                                                                                               |                                  |                |          |          |           |       |
|                         | Position          | Point     | Location of the runway end in the direction of departure                                                                                                                               |                                  | 1 m            | critical | surveyed | 1/100 sec | 1 sec |
|                         | Elevation         | Elevation | Elevation of the end position of the runway                                                                                                                                            |                                  | See Note 3     |          |          |           |       |
| Departure end of runway |                   |           | Departure end of the runway (DER), which is the end of the area declared suitable for take-off (i.e. the end of the runway or, where a clearway is provided, the end of the clearway). | Beginning of departure procedure |                |          |          |           |       |
|                         | Position          | Point     | Geographical location of DER                                                                                                                                                           |                                  |                |          |          |           |       |
|                         | Elevation         | Elevation | The elevation of DER is the elevation of the end of the runway or the elevation of the end of the clearway, whichever is higher.                                                       |                                  |                |          |          |           |       |
| 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           | 0.25 m or 1 ft |          |          |           |       |
|                         | Slope             | Value     | The slope of the runway touchdown zone                                                                                                                                                 |                                  |                |          |          |           |       |
| Slope                   |                   | Value     | Slope of the runway                                                                                                                                                                    |                                  |                |          |          |           |       |
| LAHSO                   |                   |           | Land and Hold Short Operations                                                                                                                                                         |                                  |                |          |          |           |       |
|                         | Geometry          | Line      | Geographical location of Land and Hold Short Operations (LAHSO)                                                                                                                        |                                  |                |          |          |           |       |
|                         | Protected element | Text      | Name of runway or taxiway being protected                                                                                                                                              |                                  |                |          |          |           |       |
| Displaced area          |                   |           | That portion of a runway between the beginning of the runway and the displaced threshold.                                                                                              |                                  |                |          |          |           |       |
|                         | Geometry          | Polygon   | Geographical location of the displaced area                                                                                                                                            |                                  |                |          |          |           |       |

|          |                      |          |                                                                                                                                                                                                                                  |        |     |           |          |             |     |
|----------|----------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|-----------|----------|-------------|-----|
|          | PCR                  | Text     | Pavement classification rating of the displaced area                                                                                                                                                                             |        |     |           |          |             |     |
|          | Surface type         | Text     | The surface type of the displaced area                                                                                                                                                                                           |        |     |           |          |             |     |
|          | Aircraft restriction | Text     | Usage restriction for specific aircraft type                                                                                                                                                                                     |        |     |           |          |             |     |
| Stopway  |                      |          | 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 | 1 m | critical  | surveyed | 1 m or 1 ft | 1 m |
|          | Width                | Distance | Width of the stopway                                                                                                                                                                                                             |        | 1 m | critical  | surveyed | 1 m or 1 ft | 1 m |
|          | Geometry             | Polygon  | Geographical location of the stopway                                                                                                                                                                                             |        |     |           |          |             |     |
|          | Slope                | Value    | Slope of stopway                                                                                                                                                                                                                 |        |     |           |          |             |     |
|          | Surface type         | Text     | The surface type of the stopway                                                                                                                                                                                                  |        |     |           |          |             |     |
| 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                                                                                                                                                                                          |        | 1 m | essential | surveyed | 1 m or 1 ft |     |
|          | Width                | Distance | The transversal extent of the clearway                                                                                                                                                                                           |        | 1 m | essential | surveyed | 1 m or 1 ft |     |
|          | Ground profile       |          | The vertical profile (or slope) of the clearway                                                                                                                                                                                  | if any |     |           |          |             |     |
| RESA     |                      |          | An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or                                                  |        |     |           |          |             |     |

|                    |          |                                                                                                                                        |                         |     |          |          |             |     |  |
|--------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----|----------|----------|-------------|-----|--|
|                    |          |                                                                                                                                        | overrunning the runway. |     |          |          |             |     |  |
| Length             | Distance | The longitudinal extent of Runway End Safety Area                                                                                      |                         |     |          |          |             |     |  |
| Width              | Distance | The transversal extent of the Runway End Safety Area                                                                                   |                         |     |          |          |             |     |  |
| Longitudinal slope | Value    | Longitudinal slope of Runway End Safety Area                                                                                           |                         |     |          |          |             |     |  |
| Transverse slope   | Value    | Transverse slope Runway End Safety Area                                                                                                |                         |     |          |          |             |     |  |
| Declared distances |          |                                                                                                                                        |                         |     |          |          |             |     |  |
| TORA               | Distance | Take-off run available - The length of runway declared available and suitable for the ground run of an aeroplane taking off.           |                         | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |  |
| TODA               | Distance | Take-off distance available - The length of the take-off run available plus the length of the clearway, if provided.                   |                         | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |  |
| ASDA               | Distance | Accelerate-stop distance available - The length of the take-off run available plus the length of the stopway, if provided.             |                         | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |  |
| LDA                | Distance | Landing distance available - The length of runway which is declared available and suitable for the ground run of an aeroplane landing. |                         | 1 m | critical | surveyed | 1 m or 1 ft | 1 m |  |
| Remarks            | Text     | Remarks including runway entry or start point where alternative reduced declared distances have been declared.                         |                         |     |          |          |             |     |  |
| RWY End LGT        |          |                                                                                                                                        |                         |     |          |          |             |     |  |
| Colour             | Text     | Colour of runway end lights                                                                                                            |                         |     |          |          |             |     |  |
| Position           | Point    | Geographical location of each individual light of the runway end lights                                                                |                         |     |          |          |             |     |  |
| SWY LGT            |          |                                                                                                                                        |                         |     |          |          |             |     |  |

|  |                                        |                |          |                                                                                              |  |  |  |  |  |  |
|--|----------------------------------------|----------------|----------|----------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  |                                        | Length         | Distance | The longitudinal extent of stopway lights                                                    |  |  |  |  |  |  |
|  |                                        | Colour         | Text     | Colour of stopway lights                                                                     |  |  |  |  |  |  |
|  |                                        | Position       | Point    | Geographical location of each individual light of the stopway lights                         |  |  |  |  |  |  |
|  | Approach lighting system               |                |          |                                                                                              |  |  |  |  |  |  |
|  |                                        | Type           | Text     | Classification of the approach lighting system using as criteria the ICAO Annex 14 standards |  |  |  |  |  |  |
|  |                                        | Length         | Distance | The longitudinal extent of approach lighting system                                          |  |  |  |  |  |  |
|  |                                        | Intensity      | Text     | A code indicating the relative intensity of the lighting system                              |  |  |  |  |  |  |
|  |                                        | Position       | Point    | Geographical location of each individual light of the approach lighting system               |  |  |  |  |  |  |
|  | RWY threshold lights                   |                |          |                                                                                              |  |  |  |  |  |  |
|  |                                        | Colour         | Text     | Colour of runway threshold lights                                                            |  |  |  |  |  |  |
|  |                                        | Wing bar color | Text     | Colour of runway threshold wing bars                                                         |  |  |  |  |  |  |
|  |                                        | Position       | Point    | Geographical location of each individual light of the threshold and wing bar lights          |  |  |  |  |  |  |
|  | Touchdown zone lights                  |                |          |                                                                                              |  |  |  |  |  |  |
|  |                                        | Length         | Distance | The longitudinal extent of the runway touchdown zone lights                                  |  |  |  |  |  |  |
|  |                                        | Position       | Point    | Geographical location of each individual light of the touchdown zone lights                  |  |  |  |  |  |  |
|  | Visual approach slope indicator system |                |          |                                                                                              |  |  |  |  |  |  |
|  |                                        | MEHT           | Height   | Minimum Eye Height over the Threshold                                                        |  |  |  |  |  |  |
|  |                                        | Position       | Point    | Geographical location of Visual approach slope indicator system                              |  |  |  |  |  |  |
|  |                                        | Angle          | Angle    | Nominal approach slope angle(s)                                                              |  |  |  |  |  |  |

|  |                      |                        |          |                                                                                                                                                                                                     |  |  |  |  |  |  |
|--|----------------------|------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  |                      | Type                   | Text     | Type of VGSI (VASI, PAPI etc.)                                                                                                                                                                      |  |  |  |  |  |  |
|  |                      | Displacement angle     | Angle    | Where the axis of the system is not parallel to the runway centre line, the angle of displacement                                                                                                   |  |  |  |  |  |  |
|  |                      | Displacement direction | Text     | Where the axis of the system is not parallel to the runway centre line, the direction of displacement, i.e. left or right                                                                           |  |  |  |  |  |  |
|  | Arresting gear       |                        | Line     | Geographical location of the arresting gear cable across the runway                                                                                                                                 |  |  |  |  |  |  |
|  | Arresting system     |                        |          | 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. |  |  |  |  |  |  |
|  |                      | Geometry               | Polygon  | The geographical location of the arresting system                                                                                                                                                   |  |  |  |  |  |  |
|  |                      | Setback                | Distance | Setback of the arresting system                                                                                                                                                                     |  |  |  |  |  |  |
|  |                      | Length                 | Distance | The longitudinal extent of arresting system                                                                                                                                                         |  |  |  |  |  |  |
|  |                      | Width                  | Distance | The transverse extent of arresting system                                                                                                                                                           |  |  |  |  |  |  |
|  | Radio altimeter area |                        |          |                                                                                                                                                                                                     |  |  |  |  |  |  |
|  | Length               |                        | Distance | The longitudinal extent of radio altimeter area                                                                                                                                                     |  |  |  |  |  |  |
|  | Width                |                        | Distance | The transverse extent of radio altimeter area                                                                                                                                                       |  |  |  |  |  |  |
|  | Geometry             |                        | Polygon  | Geographical location of radio altimeter area                                                                                                                                                       |  |  |  |  |  |  |

|         |                                                                       |        |           |          |                 |               |
|---------|-----------------------------------------------------------------------|--------|-----------|----------|-----------------|---------------|
| Note 1) | Threshold elevation for runways with non-precision approaches         | 0.5 m  | essential | surveyed | 1 m or 1 ft     | 1 m or 1 ft   |
|         | Threshold elevation for runways with precision approaches             | 0.25 m | 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 | 0.5 m  | essential | surveyed | 1 m or 1 ft     | 1 m or 1 ft   |

|         |                                                                                                                                                                                                                                              |                                     |          |          |                 |               |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|----------|-----------------|---------------|
|         | WGS-84 geoid undulation at runway threshold, precision approaches                                                                                                                                                                            | 0.25 m                              | critical | surveyed | 0.1 m or 0.1 ft | 0.5 m or 1 ft |
| Note 3) | Elevation of the runway end and any significant high and low intermediate points along the runway for non-precision approaches<br>Elevation of the runway end and the highest elevation of the touchdown zone for precision approach runways | 0.5 m or 1 ft<br><br>0.25 m or 1 ft |          |          |                 |               |

| Subject | Property                | Sub-Property     | Type      | Description                                                                                                                                                                                                                                                                                                                             | Note | Accuracy    | Integrity | Orig Type | Pub. Res. | Chart Res. |
|---------|-------------------------|------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|-----------|-----------|-----------|------------|
| FATO    |                         |                  |           | 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. |      |             |           |           | –         | –          |
|         | Threshold               |                  |           | The beginning of that portion of the FATO usable for landing.                                                                                                                                                                                                                                                                           |      |             |           |           |           |            |
|         |                         | Position         | Point     | Geographical location of FATO threshold                                                                                                                                                                                                                                                                                                 |      | 1m          | critical  | surveyed  | 1/100 sec | 1 sec      |
|         |                         | Elevation        | Elevation | Elevation of the FATO threshold                                                                                                                                                                                                                                                                                                         |      | See Note 1) |           |           |           |            |
|         |                         | Geoid undulation | Height    | WGS-84 Geoid undulation at FATO threshold position                                                                                                                                                                                                                                                                                      |      | See Note 2) |           |           |           |            |
|         | Departure end of runway |                  |           | Departure end of the runway (DER), which is the end of the area declared suitable for take-off (i.e. the end of the runway or, where a clearway is provided, the                                                                                                                                                                        |      |             |           |           |           |            |

|                    |           |           |                                                                                                                                                                                |                                                            |           |          |          |              |       |
|--------------------|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------|----------|----------|--------------|-------|
|                    |           |           | end of the clearway or the end of the final approach and take-off (FATO) area).                                                                                                |                                                            |           |          |          |              |       |
|                    | Position  | Point     | Geographical location of DER                                                                                                                                                   |                                                            | 1m        | critical | surveyed | 1/100 sec    | 1 sec |
|                    | Elevation | Elevation | The elevation of the DER is the higher of the elevations of the beginning and end of the runway/FATO.                                                                          |                                                            |           |          |          |              |       |
| Type               |           | Text      | Type of FATO according to ICAO Heliport Manual (Doc 9261)                                                                                                                      |                                                            |           |          |          |              |       |
| Designation        |           | Text      | The full textual designator of the landing and take-off area.                                                                                                                  |                                                            |           |          |          |              |       |
| Length             |           | Distance  | The longitudinal extent of FATO                                                                                                                                                |                                                            | 1m        | critical | surveyed | 1 m or 1 ft  | 1 m   |
| Width              |           | Distance  | The transversal extent of FATO                                                                                                                                                 |                                                            |           |          |          |              |       |
| Geometry           |           | Polygon   | Geographical location of FATO element                                                                                                                                          |                                                            |           |          |          |              |       |
| Slope              |           | Value     | The slope of FATO                                                                                                                                                              |                                                            |           |          |          |              |       |
| Surface type       |           | Text      | The surface type of FATO                                                                                                                                                       |                                                            |           |          |          |              |       |
| True bearing       |           | Bearing   | The true bearing of FATO                                                                                                                                                       |                                                            | 1/100 deg | routine  | surveyed | 1/100 degree |       |
| Declared distances |           |           |                                                                                                                                                                                |                                                            |           |          |          |              |       |
|                    | TODAH     | Distance  | Take-off distance available - The length of the FATO plus the length of helicopter clearway (if provided)                                                                      | and if applicable, alternative reduced declared distances; | 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. |                                                            | 1m        | critical | surveyed | 1 m or 1 ft  |       |
|                    | LDAH      | Distance  | Landing distance available - The length of the FATO plus any additional area declared available and suitable for helicopters to                                                |                                                            | 1m        | critical | surveyed | 1 m or 1 ft  |       |

|                          |              |          |                                                                                                         |                                                |  |    |          |          |                    |
|--------------------------|--------------|----------|---------------------------------------------------------------------------------------------------------|------------------------------------------------|--|----|----------|----------|--------------------|
|                          |              |          | complete the landing manoeuvre from a defined height.                                                   |                                                |  |    |          |          |                    |
|                          | Remarks      | Text     | Remarks including entry or start point where alternative reduced declared distances have been declared. |                                                |  |    |          |          |                    |
| FATO marking             |              |          |                                                                                                         |                                                |  |    |          |          |                    |
|                          | Description  | Text     | Description of FATO markings                                                                            |                                                |  |    |          |          |                    |
| Approach lighting system |              |          |                                                                                                         |                                                |  |    |          |          |                    |
|                          | Type         | Text     | Classification of the approach lighting system using as criteria the ICAO Annex 14 standards            |                                                |  |    |          |          |                    |
|                          | Length       | Distance | The longitudinal extent of approach lighting system.                                                    |                                                |  |    |          |          |                    |
|                          | Intensity    | Text     | A code indicating the relative intensity of the lighting system.                                        |                                                |  |    |          |          |                    |
|                          | Position     | Point    | Geographical location of each individual light of the approach lighting system                          |                                                |  |    |          |          |                    |
| Area lights              |              |          |                                                                                                         |                                                |  |    |          |          |                    |
|                          | Description  | Text     | Characteristics of area lights                                                                          |                                                |  |    |          |          |                    |
|                          | Position     | Point    | Geographical location of each individual light of the area lights                                       |                                                |  |    |          |          |                    |
| Aiming point lights      |              |          |                                                                                                         |                                                |  |    |          |          |                    |
|                          | Description  | Text     | Characteristics of aiming point lights                                                                  |                                                |  |    |          |          |                    |
|                          | Position     | Point    | Geographical location of each individual light of the aiming point lights                               |                                                |  |    |          |          |                    |
| TLOF                     |              |          | Touchdown and lift-off area. An area on which a helicopter may touch down or lift off.                  |                                                |  |    |          |          |                    |
|                          | Designator   | Text     | The full textual designator of TLOF                                                                     |                                                |  |    |          |          |                    |
|                          | Centre point |          |                                                                                                         |                                                |  |    |          |          |                    |
|                          |              | Position | Point                                                                                                   | Geographical location of TLOF geometric centre |  | 1m | critical | surveyed | 1/100 sec<br>1 sec |

|                     |                                             |                  |           |                                                                                                                                                                                                                                     |  |             |          |          |             |     |
|---------------------|---------------------------------------------|------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|----------|----------|-------------|-----|
|                     |                                             | Elevation        | Elevation | Elevation of the TLOF geometric centre                                                                                                                                                                                              |  | See Note 1) |          |          |             |     |
|                     |                                             | Geoid undulation | Height    | WGS-84 Geoid undulation at TLOF geometric centre position                                                                                                                                                                           |  | See Note 2) |          |          |             |     |
|                     | Length                                      |                  | Distance  | The longitudinal extent of TLOF                                                                                                                                                                                                     |  | 1m          | critical | surveyed | 1 m or 1 ft | 1 m |
|                     | Width                                       |                  | Distance  | The transversal extent of TLOF                                                                                                                                                                                                      |  | 1m          | critical | surveyed | 1 m or 1 ft | 1 m |
|                     | Geometry                                    |                  | Polygon   | Geographical location of TLOF element                                                                                                                                                                                               |  |             |          |          |             |     |
|                     | Slope                                       |                  | Value     | The slope of TLOF                                                                                                                                                                                                                   |  |             |          |          |             |     |
|                     | Surface type                                |                  | Text      | The surface type of TLOF                                                                                                                                                                                                            |  |             |          |          |             |     |
|                     | Bearing strength                            |                  | Value     | The bearing strength of TLOF                                                                                                                                                                                                        |  |             |          |          | 1 tone      |     |
|                     | Visual approach slope indicator system type |                  | Text      | Type of visual approach slope indicator system                                                                                                                                                                                      |  |             |          |          |             |     |
|                     | Marking                                     |                  |           |                                                                                                                                                                                                                                     |  |             |          |          |             |     |
|                     |                                             | Description      | Text      | Description of TLOF markings                                                                                                                                                                                                        |  |             |          |          |             |     |
| Safety area         |                                             |                  |           | 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                                                                                                                                                                                              |  |             |          |          |             |     |
|                     | Width                                       |                  | Distance  | The transversal extent of safety area                                                                                                                                                                                               |  |             |          |          |             |     |
|                     | Surface type                                |                  | Text      | The surface type of safety area                                                                                                                                                                                                     |  |             |          |          |             |     |
| Helicopter clearway |                                             |                  |           | 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.                                            |  |             |          |          |             |     |
|                     | Length                                      |                  | Distance  | The longitudinal extent of the                                                                                                                                                                                                      |  |             |          |          |             |     |

|                                                                                                                                                                                                                                                                                 |                |  |       |                                                    |       |           |          |                                                            |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--|-------|----------------------------------------------------|-------|-----------|----------|------------------------------------------------------------|--|--|
|                                                                                                                                                                                                                                                                                 |                |  |       | helicopter clearway                                |       |           |          |                                                            |  |  |
|                                                                                                                                                                                                                                                                                 | Ground profile |  | Value | Vertical profile (or slope) of helicopter clearway |       |           |          |                                                            |  |  |
|                                                                                                                                                                                                                                                                                 |                |  |       |                                                    |       |           |          |                                                            |  |  |
| Note 1) FATO threshold, for heliports with or without a PinS approach<br>FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2                                                                                                     |                |  |       |                                                    | 0.5m  | essential | surveyed | 1 m or 1 ft                                                |  |  |
|                                                                                                                                                                                                                                                                                 |                |  |       |                                                    | 0.25m | critical  | surveyed | 1 m or 1 ft (non-precision)<br>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<br>WGS-84 geoid undulation at FATO threshold, TLOF geometric centre, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 |                |  |       |                                                    | 0.5m  | essential | surveyed | 1 m or 1 ft                                                |  |  |
|                                                                                                                                                                                                                                                                                 |                |  |       |                                                    | 0.25m | critical  | surveyed | 1 m or 1 ft (non-precision)<br>0.1 m or 0.1 ft (precision) |  |  |

| Subject | Property             | Sub-Property  | Type    | Description                                                                                                                                                             | Note | 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. |      |          |           |           | –         | –          |
|         | Designator           |               | Text    | The full textual name or designator used to identify an apron at an aerodrome/heliport.                                                                                 |      |          |           |           |           |            |
|         | Geometry             |               | Polygon | Geographical location of the apron element                                                                                                                              |      | 1m       | routine   | surveyed  | 1/10 sec  | 1 sec      |
|         | Type                 |               | Text    | Classification of the primary use for the apron                                                                                                                         |      |          |           |           |           |            |
|         | Aircraft restriction |               | Text    | Usage restriction (prohibition) for specified aircraft type                                                                                                             |      |          |           |           |           |            |
|         | Surface type         |               | Text    | The surface type of the apron                                                                                                                                           |      |          |           |           |           |            |
|         | Strength             |               |         |                                                                                                                                                                         |      |          |           |           |           |            |
|         |                      | PCR           | Text    | Pavement classification rating of apron                                                                                                                                 |      |          |           |           |           |            |
|         |                      | Pavement type | Text    | Pavement type for aircraft classification rating — pavement                                                                                                             |      |          |           |           |           |            |

|                    |                                  |                    |           |                                                                                                                                                          |  |      |           |          |             |           |
|--------------------|----------------------------------|--------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|-----------|----------|-------------|-----------|
|                    |                                  |                    |           | classification rating (ACR-PCR) determination                                                                                                            |  |      |           |          |             |           |
|                    |                                  | Subgrade category  | Text      | Subgrade strength category of apron                                                                                                                      |  |      |           |          |             |           |
|                    |                                  | Allowable pressure | Text      | Maximum allowable tire pressure category or maximum allowable tire pressure value                                                                        |  |      |           |          |             |           |
|                    |                                  | Evaluation method  | Text      | The evaluation method used to determine the apron strength                                                                                               |  |      |           |          |             |           |
|                    | Elevation                        |                    | Elevation | The elevation of the apron                                                                                                                               |  |      |           |          |             |           |
| Taxiway            |                                  |                    |           | 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.                                                                                                              |  |      |           |          |             |           |
|                    | Width                            |                    | Distance  | The transversal extent of the taxiway.                                                                                                                   |  | 1m   | essential | surveyed | 1 m or 1 ft |           |
|                    | Geometry                         |                    | Polygon   | Geographical location of the taxiway element                                                                                                             |  |      |           |          |             |           |
|                    | Bridge                           |                    | Text      | Type of bridge (none, overpass, underpass)                                                                                                               |  |      |           |          |             |           |
|                    | Surface type                     |                    | Text      | Surface type of taxiway                                                                                                                                  |  |      |           |          |             |           |
| Strength           |                                  |                    |           |                                                                                                                                                          |  |      |           |          |             |           |
|                    |                                  | PCR                | Text      | Pavement classification rating of taxiway                                                                                                                |  |      |           |          |             |           |
|                    |                                  | Pavement type      | Text      | Pavement type for aircraft classification rating — pavement classification rating (ACR-PCR) determination                                                |  |      |           |          |             |           |
|                    |                                  | Subgrade category  | Text      | Subgrade strength category of taxiway                                                                                                                    |  |      |           |          |             |           |
|                    |                                  | Allowable pressure | Text      | Maximum allowable tire pressure category or maximum allowable tire pressure value                                                                        |  |      |           |          |             |           |
|                    |                                  | Evaluation method  | Text      | The evaluation method used to determine the taxiway strength                                                                                             |  |      |           |          |             |           |
|                    | Aircraft restrictions            |                    | Text      | Usage restriction (prohibition) for specified aircraft type                                                                                              |  |      |           |          |             |           |
|                    | Reference code letter            |                    | Code list | A letter based on the aeroplane wingspan and outer main gear wheel span                                                                                  |  |      |           |          |             |           |
|                    | Location for wing tips extension | Position           | Point     | For aerodromes accommodating aeroplanes with folding wing tips, the location where to extend the wing tips                                               |  |      |           |          |             |           |
| Center line points |                                  |                    |           |                                                                                                                                                          |  |      |           |          |             |           |
|                    |                                  | Position           | Point     | Geographical coordinates of taxiway center line points                                                                                                   |  | 0.5m | essential | surveyed | 1/100 sec   | 1/100 sec |
|                    |                                  | Elevation          | Elevation | Elevation of taxiway center line points                                                                                                                  |  | 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                                                                                    |        |       |           |          |             |           |
|                                            | Surface type | Text     | Surface type of taxiway shoulder                                                                                                 |        |       |           |          |             |           |
|                                            | Width        | Distance | The width of the taxiway shoulder                                                                                                |        | 1m    | essential | surveyed | 1 m or 1 ft |           |
| Guidance lines                             |              |          |                                                                                                                                  |        |       |           |          |             |           |
|                                            | Geometry     | Line     | Geographical location of guidance lines                                                                                          |        | 0.5 m | essential | surveyed | 1/100 sec   | 1/100 sec |
|                                            | Colour       | Text     | Colour of taxiway guidance lines                                                                                                 |        |       |           |          |             |           |
|                                            | Style        | Text     | Style of taxiway guidance lines                                                                                                  |        |       |           |          |             |           |
|                                            | Wingspan     | Value    | Wingspan                                                                                                                         |        |       |           |          |             |           |
|                                            | Maxspeed     | Value    | Maximum speed                                                                                                                    |        |       |           |          |             |           |
|                                            | Direction    | Text     | Direction                                                                                                                        |        |       |           |          |             |           |
| Intermediate holding position marking line |              | Line     | Intermediate holding position marking line                                                                                       |        | 0.5 m | essential | surveyed | 1/100 sec   | 1 sec     |
| Taxiway marking                            |              |          |                                                                                                                                  |        |       |           |          |             |           |
|                                            | Description  | Text     | Description of taxiway marking                                                                                                   |        |       |           |          |             |           |
| Taxiway edge lights                        |              |          |                                                                                                                                  |        |       |           |          |             |           |
|                                            | Description  | Text     | Description of taxiway edge 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                                                                                        |        |       |           |          |             |           |
|                                            | Position     | Point    | Geographical location of each individual light of the taxiway center line lights                                                 |        |       |           |          |             |           |
| Stop bars                                  |              |          |                                                                                                                                  |        |       |           |          |             |           |
|                                            | Description  | Text     | Description of the stop bars                                                                                                     | if any |       |           |          |             |           |
|                                            | Geometry     | Line     | Location of the stop bar                                                                                                         |        |       |           |          |             |           |
| Runway guard lights                        |              |          |                                                                                                                                  |        |       |           |          |             |           |
|                                            | Description  | Text     | Description of the runway guard lights and other runway protection measures                                                      | if any |       |           |          |             |           |

|                                     |                                         |                         |               |                                                                                                                                                                                                                                                             |                     |       |               |                                 |              |       |
|-------------------------------------|-----------------------------------------|-------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|---------------|---------------------------------|--------------|-------|
|                                     |                                         | Position                | Point         | Location of the stop bar                                                                                                                                                                                                                                    | Configurat<br>ion A |       |               |                                 |              |       |
|                                     |                                         | Geometr<br>y            | Line          | Location of the stop bar                                                                                                                                                                                                                                    | Configurat<br>ion B |       |               |                                 |              |       |
| Runway<br>holding<br>position       |                                         |                         |               | A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/ MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.          |                     |       |               |                                 |              |       |
|                                     |                                         | Geometr<br>y            | Line          | Geographical location of runway holding position                                                                                                                                                                                                            |                     | 0.5m  | critical      | surveye<br>d                    | 1/100<br>sec | 1 sec |
|                                     |                                         | Protecte<br>d<br>runway | Text          | Designator of the runway protected                                                                                                                                                                                                                          |                     |       |               |                                 |              |       |
|                                     |                                         | Catstop                 | Code<br>list  | CAT of runway (0, I, II, III)                                                                                                                                                                                                                               |                     |       |               |                                 |              |       |
|                                     |                                         | RWY<br>ahead<br>text    | Text          | Actual text as it exists in the marking. For example, RWY AHEAD or RUNWAY AHEAD.                                                                                                                                                                            |                     |       |               |                                 |              |       |
|                                     | Intermedi<br>ate<br>holding<br>position | Geometr<br>y            | Line          | Geographical location of intermediate holding position - A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower. |                     |       |               |                                 |              |       |
| Helicopt<br>er<br>ground<br>taxiway |                                         |                         |               | A ground taxiway intended for the ground movement of wheeled undercarriage helicopters. (Annex 14)                                                                                                                                                          |                     |       |               |                                 |              |       |
|                                     | Designato<br>r                          |                         | Text          | The full textual designator of helicopter ground taxiway                                                                                                                                                                                                    |                     |       |               |                                 |              |       |
|                                     | Center<br>line points                   |                         | Point         | Geographical location of helicopter ground center line taxiway points                                                                                                                                                                                       |                     | 0.5m  | essenti<br>al | surveye<br>d/<br>calculat<br>ed |              |       |
|                                     | Elevation                               |                         | Elevati<br>on | Elevation of helicopter ground taxiway                                                                                                                                                                                                                      |                     | 1m    | essenti<br>al | surveye<br>d                    |              |       |
|                                     | Width                                   |                         | Distan<br>ce  | The transversal extent of the helicopter ground taxiway                                                                                                                                                                                                     |                     | 1m    | essenti<br>al | surveye<br>d                    |              |       |
|                                     | Surface<br>type                         |                         | Text          | The surface type of the helicopter ground taxiway                                                                                                                                                                                                           |                     |       |               |                                 |              |       |
|                                     | Intersecti<br>on<br>marking<br>line     |                         | Line          | Helicopter ground taxiway intersection marking line                                                                                                                                                                                                         |                     | 0.5 m | essenti<br>al | surveye<br>d                    | 1/100<br>sec | 1 sec |
|                                     | Lighting                                |                         |               |                                                                                                                                                                                                                                                             |                     |       |               |                                 |              |       |
|                                     |                                         | Descripti<br>on         | Text          | Description of helicopter ground taxiway light                                                                                                                                                                                                              |                     |       |               |                                 |              |       |
|                                     |                                         | Position                | Point         | Geographical location of each individual light of the helicopter ground taxiway lights                                                                                                                                                                      |                     |       |               |                                 |              |       |
|                                     | Marking                                 |                         |               |                                                                                                                                                                                                                                                             |                     |       |               |                                 |              |       |
|                                     |                                         | Descripti<br>on         | Text          | Description of helicopter ground taxiway marking                                                                                                                                                                                                            |                     |       |               |                                 |              |       |
| Helicopt<br>er air<br>taxiway       |                                         |                         |               | A defined path on the surface established for the air taxiing of helicopters. (Annex 14)                                                                                                                                                                    |                     |       |               |                                 |              |       |

|                               |                       |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|-------------------------------|-----------------------|----------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|-----------|---------------------|-----------|-----------|
|                               | Designator            |                |           | The full textual designator of helicopter air taxiway                                                                                                                                           |                 |      |           |                     |           |           |
|                               | Center line points    |                | Point     | Geographical location of helicopter air taxiway center line points                                                                                                                              |                 | 0.5m | essential | surveyed/calculated |           |           |
|                               | Elevation             |                | Elevation | Elevation of helicopter air taxiway                                                                                                                                                             |                 | 1m   | essential | surveyed            |           |           |
|                               | Width                 |                | Distance  | The transversal extent of the helicopter air taxiway                                                                                                                                            |                 | 1m   | essential | surveyed            |           |           |
|                               | Surface type          |                | Text      | Surface type of helicopter air taxiway                                                                                                                                                          |                 |      |           |                     |           |           |
|                               | Lighting              |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|                               |                       | Description    | Text      | Description of helicopter air taxiway lighting                                                                                                                                                  |                 |      |           |                     |           |           |
|                               |                       | Position       | Point     | Geographical location of each individual light of the helicopter air taxiway lights                                                                                                             |                 |      |           |                     |           |           |
|                               | Marking               |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|                               |                       | Description    | Text      | Description of helicopter air taxiway marking                                                                                                                                                   |                 |      |           |                     |           |           |
| Helicopter air transit routes |                       |                |           | 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. |                 |      |           |                     |           |           |
|                               | Designator            |                | Text      | Designator of helicopter air transit route                                                                                                                                                      |                 |      |           |                     |           |           |
|                               | Geometry              |                | Line      | Geographical location of helicopter air transit route                                                                                                                                           |                 |      |           |                     |           |           |
|                               | Width                 |                | Distance  | The transversal extent of the helicopter air transit route                                                                                                                                      |                 | 1m   | essential | Surveyed            |           |           |
| INS checkpoint                |                       |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|                               | Position              |                | Point     | Geographical location of the INS check point                                                                                                                                                    | where available | 0.5m | routine   | surveyed            | 1/100 sec | 1/100 sec |
| VOR checkpoint                |                       |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|                               | Position              |                | Point     | Geographical location of the VOR check point                                                                                                                                                    | where available |      |           |                     |           |           |
|                               | Frequency             |                | Value     | Frequency of the VOR check point                                                                                                                                                                |                 |      |           |                     |           |           |
| Altimeter checkpoint          |                       |                |           |                                                                                                                                                                                                 |                 |      |           |                     |           |           |
|                               | Position              |                | Point     | Geographical location of altimeter checkpoints                                                                                                                                                  |                 |      |           |                     |           |           |
|                               | Elevation             |                | Elevation | Elevation of altimeter checkpoints                                                                                                                                                              |                 |      |           |                     |           |           |
| Aircraft stand                |                       |                |           | A designated area on an apron intended to be used for parking an aircraft                                                                                                                       |                 |      |           |                     |           |           |
|                               | Name                  |                | Text      | Name of the aircraft stand point                                                                                                                                                                |                 |      |           |                     |           |           |
|                               | Aircraft stand points | Position       | Point     | Geographical location of aircraft stand point                                                                                                                                                   |                 | 0.5m | routine   | surveyed            | 1/100 sec | 1/100 sec |
|                               |                       | Aircraft types | Code list | Aircraft types                                                                                                                                                                                  |                 |      |           |                     |           |           |
|                               | Identification sign   |                | Text      | Description of aircraft stand identification sign                                                                                                                                               |                 |      |           |                     |           |           |

|                  |                                        |           |           |                                                                                                                                                                                                                                                                                            |  |      |           |          |           |       |
|------------------|----------------------------------------|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|-----------|----------|-----------|-------|
|                  | Visual docking parking guidance system |           | Text      | Description of visual docking/parking guidance system at the aircraft stand                                                                                                                                                                                                                |  |      |           |          |           |       |
|                  | Parking stand area                     |           | Polygon   | Geographical location of parking stand area                                                                                                                                                                                                                                                |  |      |           |          |           |       |
|                  | Jetway                                 |           | Code list | Jetway available at aircraft stand                                                                                                                                                                                                                                                         |  |      |           |          |           |       |
|                  | Fuel                                   |           | Code list | Fuel available at aircraft stand                                                                                                                                                                                                                                                           |  |      |           |          |           |       |
|                  | Ground power                           |           | Code list | Ground power available at aircraft stand                                                                                                                                                                                                                                                   |  |      |           |          |           |       |
|                  | Towing                                 |           | Code list | Towing available at aircraft stand                                                                                                                                                                                                                                                         |  |      |           |          |           |       |
|                  | Terminal                               |           | Text      | Terminal building reference                                                                                                                                                                                                                                                                |  |      |           |          |           |       |
|                  | Surface type                           |           | Text      | Surface type of the aircraft stand                                                                                                                                                                                                                                                         |  |      |           |          |           |       |
|                  | Aircraft restriction                   |           | Text      | Usage restriction (prohibition) for specified aircraft type                                                                                                                                                                                                                                |  |      |           |          |           |       |
|                  | PCR                                    |           | Text      | Pavement classification rating of aircraft stand                                                                                                                                                                                                                                           |  |      |           |          |           |       |
|                  | Stand guidance line                    |           |           |                                                                                                                                                                                                                                                                                            |  |      |           |          |           |       |
|                  |                                        | Geometry  | Line      | Geographical location of stand guidance line                                                                                                                                                                                                                                               |  | 0.5m | essential | surveyed | 1/100 sec |       |
|                  |                                        | Elevation | Elevation | Parking guidance line points elevation                                                                                                                                                                                                                                                     |  | 1m   | essential | surveyed |           |       |
|                  |                                        | Direction | Text      | Direction of stand guidance line                                                                                                                                                                                                                                                           |  |      |           |          |           |       |
|                  |                                        | Wingspan  | Value     | Wingspan                                                                                                                                                                                                                                                                                   |  |      |           |          |           |       |
|                  |                                        | Colour    | Code list | Colour of stand guidance line                                                                                                                                                                                                                                                              |  |      |           |          |           |       |
|                  |                                        | Style     | Code list | Style of stand guidance line                                                                                                                                                                                                                                                               |  |      |           |          |           |       |
| 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                                                                                                                                                                                                                                                                   |  |      |           |          |           |       |
|                  | Position                               |           | Point     | Geographical location of helicopter stand point/ INS checkpoints                                                                                                                                                                                                                           |  | 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                                                                                                                                                                                                                                                                |  |      |           |          |           |       |
|                  | Geometry                               |           | Polygon   | Geographical location of de-icing area                                                                                                                                                                                                                                                     |  | 1m   | routine   | surveyed | 1/10 sec  | 1 sec |
|                  | Surface type                           |           | Text      | The surface type of the deicing area                                                                                                                                                                                                                                                       |  |      |           |          |           |       |
|                  | Idbase                                 |           | Text      | Name of underlying Taxiway, Parkingstand or Apron Element                                                                                                                                                                                                                                  |  |      |           |          |           |       |
|                  | Aircraft restriction                   |           | Text      | Usage restriction (prohibition) for specified aircraft type                                                                                                                                                                                                                                |  |      |           |          |           |       |

|                         |          |  |         |                                                                                                                                |  |  |  |  |  |  |
|-------------------------|----------|--|---------|--------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Extended wing tips area |          |  |         | For aerodromes accommodating aeroplanes with folding wing tips, the areas where it is safe to operate with extended wing tips. |  |  |  |  |  |  |
|                         | Geometry |  | Polygon | Geographical location of the area                                                                                              |  |  |  |  |  |  |
|                         | Wingspan |  | Value   | Maximum wingspan                                                                                                               |  |  |  |  |  |  |

| Subject                | Property            | Sub-Property | Type     | Description                                       | Note           | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|------------------------|---------------------|--------------|----------|---------------------------------------------------|----------------|----------|-----------|-----------|-----------|------------|
| Communication facility |                     |              |          |                                                   |                |          |           |           |           |            |
|                        | Service designation |              | Text     | Designation of the service provided               |                |          |           |           |           |            |
|                        | Call sign           |              | Text     | Call sign of the communication facility           |                |          |           |           |           |            |
|                        | Channel             |              | Text     | Channel/Frequency of the communication facility   |                |          |           |           |           |            |
|                        | Logon address       |              | Text     | The logon address of the facility                 | as appropriate |          |           |           |           |            |
|                        | Hours of operation  |              | Schedule | Operational hours of the station serving the unit |                |          |           |           |           |            |

Table S1-2 Airspace data

| Subject      | Property          | Sub-Property | Type      | Description                                                                                                                                                                             | Note | 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.                                                                                                                                        |      |             |           |            |                |                |
|              | Name              |              | Text      | The designator given to an airspace by a responsible authority                                                                                                                          |      |             |           |            |                |                |
|              | Lateral limits    |              | Polygon   | The surface defining the horizontal shape of the Airspace                                                                                                                               |      | see Note 1) |           |            |                |                |
|              | Vertical limits   |              |           |                                                                                                                                                                                         |      |             |           |            |                |                |
|              |                   | Upper limit  | Altitude  | The upper limit of the airspace                                                                                                                                                         |      |             |           |            |                |                |
|              |                   | Lower limit  | Altitude  | The lower limit of the airspace                                                                                                                                                         |      | 50 m        | routine   | calculated | 50 m or 100 ft | 50 m or 100 ft |
|              | Class of airspace |              | Code list | A categorisation of airspace which determines the                                                                                                                                       |      |             |           |            |                |                |

|                        |                  |           |                                                                                                                   |  |  |  |  |  |  |  |
|------------------------|------------------|-----------|-------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|                        |                  |           | operating rules, flight requirements, and services provided, as indicated in Annex 11, Section 2.6 and Appendix 4 |  |  |  |  |  |  |  |
| Transition altitude    |                  | Altitude  | The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.      |  |  |  |  |  |  |  |
| Hours of applicability |                  | Schedule  | The hours of applicability of the airspace                                                                        |  |  |  |  |  |  |  |
| ATS Unit               |                  |           | Unit providing service                                                                                            |  |  |  |  |  |  |  |
|                        | Name             | Text      | The name of the unit providing the service                                                                        |  |  |  |  |  |  |  |
|                        | Call sign        | Text      | The call sign of the aeronautical station serving the unit                                                        |  |  |  |  |  |  |  |
|                        | Language         | Code list | Information on the language(s) used, specifying area and conditions, when and where to be used, if applicable     |  |  |  |  |  |  |  |
|                        | Applicability    | Text      | Information on the area and conditions when to be used                                                            |  |  |  |  |  |  |  |
|                        | Hours of service | Schedule  | Operational hours of the station serving the unit                                                                 |  |  |  |  |  |  |  |
| SATVOICE E number      |                  |           |                                                                                                                   |  |  |  |  |  |  |  |
|                        | Value            | Value     | The SATVOICE number of the ATS airspace                                                                           |  |  |  |  |  |  |  |
|                        | Purpose          | Text      | Indications for specific purposes of the SATVOICE number.                                                         |  |  |  |  |  |  |  |

|         |          |       |           |            |       |            |
|---------|----------|-------|-----------|------------|-------|------------|
| Note 1) | FIR, UIR | 2 km  | routine   | declared   | 1 min | as plotted |
|         | TMA, CTA | 100 m | essential | calculated | 1 sec | as plotted |
|         | CTR      | 100 m | essential | calculated | 1 sec | as plotted |

| Subject                   | Property | Sub-Property | Type      | Description                                    | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|---------------------------|----------|--------------|-----------|------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Special activity airspace |          |              |           |                                                |      |          |           |           |           |            |
|                           | Type     |              | Code list | Type of special activity airspace (See Note 1) |      |          |           |           |           |            |

|                      |             |          |                                                                                                                                                  |  |                                  |  |  |  |  |
|----------------------|-------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------|--|--|--|--|
| Identification       |             | Text     | The identification assigned to uniquely identify the airspace                                                                                    |  |                                  |  |  |  |  |
| Name                 |             | Text     | The name given to the airspace by a responsible authority                                                                                        |  |                                  |  |  |  |  |
| Lateral limits       |             | Polygon  | The surface defining the horizontal shape of the airspace                                                                                        |  | See Note 2) for P,R,D Areas only |  |  |  |  |
| Vertical limits      |             |          |                                                                                                                                                  |  |                                  |  |  |  |  |
|                      | Upper limit | Altitude | The upper limit of the airspace                                                                                                                  |  |                                  |  |  |  |  |
|                      | Lower limit | Altitude | The lower limit of the airspace                                                                                                                  |  |                                  |  |  |  |  |
| Restriction          |             | Text     | Type of restriction or nature of hazard                                                                                                          |  |                                  |  |  |  |  |
| Activation           |             | Text     | Information on system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures; |  |                                  |  |  |  |  |
| Time of activity     |             | Schedule | Time interval when the special activity takes place                                                                                              |  |                                  |  |  |  |  |
| Risk of interception |             | Text     | Risk of interception in the event of penetration                                                                                                 |  |                                  |  |  |  |  |

|                  |                                                                                                     |                                              |       |           |            |       |            |
|------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------|-------|-----------|------------|-------|------------|
| Note 1)<br>type: | Prohibited Area                                                                                     | Note 2)<br>inside CTA/CTR<br>outside CTA/CTR | 100 m | essential | calculated | 1 sec | as plotted |
|                  | Restricted Area                                                                                     |                                              | 2 km  | routine   | declared   | 1 min | as plotted |
|                  | Danger Area                                                                                         |                                              |       |           |            |       |            |
|                  | Military Exercise Area<br>Military Training Area<br>Air Defence Identification Zone (ADIZ)<br>Other |                                              |       |           |            |       |            |

| Subject                             | Property         | Sub-Property | Type | Description                                                         | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|-------------------------------------|------------------|--------------|------|---------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Aerial sporting activities airspace |                  |              |      | Airspace with intensive aerial sporting and recreational activities |      |          |           |           |           |            |
|                                     | Type of activity |              | Text | Type of aerial sporting or recreational activity                    |      |          |           |           |           |            |
|                                     | Designator       |              | Text | The designation of the airspace                                     |      |          |           |           |           |            |

|  |                  |             |          |                                                            |  |  |  |  |  |  |
|--|------------------|-------------|----------|------------------------------------------------------------|--|--|--|--|--|--|
|  | Lateral limits   |             | Polygon  | The surface defining the horizontal shape of the airspace  |  |  |  |  |  |  |
|  | Vertical limits  |             |          |                                                            |  |  |  |  |  |  |
|  |                  | Upper limit | Altitude | The upper limit of the airspace                            |  |  |  |  |  |  |
|  |                  | Lower limit | Altitude | The lower limit of the airspace                            |  |  |  |  |  |  |
|  | Time of activity |             | Schedule | Time interval when the activity takes place                |  |  |  |  |  |  |
|  | Operator         |             | Text     | Contact details (Tel. Nr. or Frequency) of operator / user |  |  |  |  |  |  |

| Subject                  | Property         | Sub-Property | Type     | Description                                                                                                                                      | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|--------------------------|------------------|--------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Other regulated airspace |                  |              |          |                                                                                                                                                  |      |          |           |           |           |            |
|                          | Type             |              | Text     | Type of airspace (RVSM, ELT etc.)                                                                                                                |      |          |           |           |           |            |
|                          | Identification   |              | Text     | The identification assigned to uniquely identify the airspace                                                                                    |      |          |           |           |           |            |
|                          | Name             |              | Text     | The name given to the airspace by a responsible authority                                                                                        |      |          |           |           |           |            |
|                          | Lateral limits   |              | Polygon  | The surface defining the horizontal shape of the airspace                                                                                        |      |          |           |           |           |            |
|                          | Vertical limits  |              |          |                                                                                                                                                  |      |          |           |           |           |            |
|                          |                  | Upper limit  | Altitude | The upper limit of the airspace                                                                                                                  |      |          |           |           |           |            |
|                          |                  | Lower limit  | Altitude | The lower limit of the airspace                                                                                                                  |      |          |           |           |           |            |
|                          | Restriction      |              | Text     | Type of restriction if any                                                                                                                       |      |          |           |           |           |            |
|                          | Activation       |              | Text     | Information on system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures. |      |          |           |           |           |            |
|                          | Time of activity |              | Schedule | Time interval when the special activity takes place                                                                                              |      |          |           |           |           |            |

| Subject            | Property        | Sub-Property | Type     | Description                                                 | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|--------------------|-----------------|--------------|----------|-------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| ATS control sector |                 |              |          |                                                             |      |          |           |           |           |            |
|                    | Identification  |              | Text     | The identification given to the sector                      |      |          |           |           |           |            |
|                    | Lateral limits  |              | Polygon  | The surface defining the horizontal shape of the ATC-sector |      |          |           |           |           |            |
|                    | Vertical limits |              |          |                                                             |      |          |           |           |           |            |
|                    |                 | Upper limit  | Altitude | The upper limit of the sector                               |      |          |           |           |           |            |
|                    |                 | Lower limit  | Altitude | The lower limit of the sector                               |      |          |           |           |           |            |

| Subject | Property | Sub-Property | Type | Description | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|---------|----------|--------------|------|-------------|------|----------|-----------|-----------|-----------|------------|
|---------|----------|--------------|------|-------------|------|----------|-----------|-----------|-----------|------------|

|                          |             |  |          |                                                                                                                                                  |  |  |  |  |  |  |
|--------------------------|-------------|--|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| Other regulated airspace |             |  |          |                                                                                                                                                  |  |  |  |  |  |  |
| Type                     |             |  | Text     | Type of airspace (RVSM, ELT etc.)                                                                                                                |  |  |  |  |  |  |
| Identification           |             |  | Text     | The identification assigned to uniquely identify the airspace                                                                                    |  |  |  |  |  |  |
| Name                     |             |  | Text     | The name given to the airspace by a responsible authority                                                                                        |  |  |  |  |  |  |
| Lateral limits           |             |  | Polygon  | The surface defining the horizontal shape of the airspace                                                                                        |  |  |  |  |  |  |
| Vertical limits          |             |  |          |                                                                                                                                                  |  |  |  |  |  |  |
|                          | Upper limit |  | Altitude | The upper limit of the airspace                                                                                                                  |  |  |  |  |  |  |
|                          | Lower limit |  | Altitude | The lower limit of the airspace                                                                                                                  |  |  |  |  |  |  |
| Restriction              |             |  | Text     | Type of restriction if any                                                                                                                       |  |  |  |  |  |  |
| Activation               |             |  | Text     | Information on system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures. |  |  |  |  |  |  |
| Time of activity         |             |  | Schedule | Time interval when the special activity takes place                                                                                              |  |  |  |  |  |  |

| Subject     | Property   | Sub-Property | Type | Description                                                                                                            | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|-------------|------------|--------------|------|------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| ATS 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). |      |          |           |           |           |            |
| Other Route |            |              |      | A specified route designed for channelling the flow of traffic as necessary without provision of                       |      |          |           |           |           |            |

|               |              |            |           |                                                                                |  |                                          |                                      |                                         |                                       |                                       |
|---------------|--------------|------------|-----------|--------------------------------------------------------------------------------|--|------------------------------------------|--------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|
|               |              |            |           | air traffic services                                                           |  |                                          |                                      |                                         |                                       |                                       |
|               | Designator   |            | Text      | Designator of the route                                                        |  |                                          |                                      |                                         |                                       |                                       |
|               | Type         |            | Text      | Type of route (e.g. VFR uncontrolled navigation routes)                        |  |                                          |                                      |                                         |                                       |                                       |
|               | Flight rules |            | Code list | Information on the flight rules that apply on the route (IFR / VFR)            |  |                                          |                                      |                                         |                                       |                                       |
| Route segment |              |            |           |                                                                                |  |                                          |                                      |                                         |                                       |                                       |
|               | From point   |            |           | Reference to the first point of a route segment                                |  |                                          |                                      |                                         |                                       |                                       |
|               |              | Designator | Text      | The coded designators or name-codes of significant point                       |  |                                          |                                      |                                         |                                       |                                       |
|               |              | Reporting  | Code list | Indication of ATS / MET reporting requirement "compulsory" or "on-request"     |  |                                          |                                      |                                         |                                       |                                       |
|               | To point     |            |           | Reference to the second point of a route segment                               |  |                                          |                                      |                                         |                                       |                                       |
|               |              | Designator | Text      | The coded designators or name-codes of significant point                       |  |                                          |                                      |                                         |                                       |                                       |
|               |              | Reporting  | Code list | Indication of the ATS / MET reporting requirement "compulsory" or "on-request" |  |                                          |                                      |                                         |                                       |                                       |
|               | Track        |            | Bearing   | Track, VOR radial or magnetic bearing of a route segment                       |  | 1/10 degree (terminal arrival departure) | routine (terminal arrival departure) | calculated (terminal arrival departure) | 1 degree (terminal arrival departure) | 1 degree (terminal arrival departure) |
|               | Length       |            | Distance  | The geodesic distance between from point and to point                          |  | See Note 2)                              |                                      |                                         |                                       |                                       |

|                            |        |           |                                                                                                                                                                                                                                                     |  |      |             |                |                   |                   |
|----------------------------|--------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|-------------|----------------|-------------------|-------------------|
| Upper limit                |        | Altitude  | The upper limit of the route segment                                                                                                                                                                                                                |  |      |             |                |                   |                   |
| Lower limit                |        | Altitude  | The lower limit of the route segment                                                                                                                                                                                                                |  |      |             |                |                   |                   |
| 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. |  | 50 m | routin<br>e | calculat<br>ed | 50 m or<br>100 ft | 50 m or<br>100 ft |
| MOCA                       |        | Altitude  | Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.                                                                                                     |  | 50 m | routin<br>e | calculat<br>ed | 50 m or<br>100 ft | 50 m or<br>100 ft |
| Minimum flight altitude    |        | Altitude  | Minimum flight altitude                                                                                                                                                                                                                             |  | 50 m | routin<br>e | calculat<br>ed | 50 m or<br>100 ft | 50 m or<br>100 ft |
| Lateral Limits             |        | Distance  | Lateral limits of route                                                                                                                                                                                                                             |  |      |             |                |                   |                   |
| Restrictions               |        | Text      | Indication on any area speed and level/altitude restrictions where established.                                                                                                                                                                     |  |      |             |                |                   |                   |
| Direction of cruise levels |        | -         | Indication on the direction of the cruising level (even, odd, NIL)                                                                                                                                                                                  |  |      |             |                |                   |                   |
|                            | Foward | Code list | Indication on the direction of the cruising level (even, odd, NIL) from                                                                                                                                                                             |  |      |             |                |                   |                   |

|                   |                          |           |                                                                                                                                                                                                                                       |          |  |  |  |  |  |
|-------------------|--------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--|--|--|--|--|
|                   |                          |           | first point to second point of route segment                                                                                                                                                                                          |          |  |  |  |  |  |
| -                 | Backward                 | Code list | Indication on the direction of the cruising level (even, odd, NIL) from second point to first point of route segment                                                                                                                  |          |  |  |  |  |  |
| Availability      |                          | Text      | Information on the route availability                                                                                                                                                                                                 |          |  |  |  |  |  |
| Class of airspace |                          | Text      | Classification of airspace (A, B, ... G) which determines the operating rules, flight requirements, and services provided. According to Annex 11, Appendix 4                                                                          |          |  |  |  |  |  |
| PBN requirements  |                          |           | Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace requirements                                                             | PBN only |  |  |  |  |  |
|                   | 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. |               |  |  |  |  |
|     |                  | Navigation performance requirements | Text | The navigation accuracy requirement for each PBN (RNAV or RNP) route segment                                                                                                                                                                                                                                                                                       |               |  |  |  |  |
|     |                  | Sensor requirements                 | Text | Indication on the sensor requirements including any navigation specification limitations                                                                                                                                                                                                                                                                           |               |  |  |  |  |
|     | Controlling unit |                                     |      |                                                                                                                                                                                                                                                                                                                                                                    |               |  |  |  |  |
|     |                  | Name                                | Text | Name of the unit providing the service                                                                                                                                                                                                                                                                                                                             |               |  |  |  |  |
|     |                  | Channel                             | Text | Operating channel / frequency of controlling unit                                                                                                                                                                                                                                                                                                                  |               |  |  |  |  |
|     |                  | Logon address                       | Text | A specified code used for data link logon to the controlling ATS unit                                                                                                                                                                                                                                                                                              | if applicable |  |  |  |  |
| AMA |                  |                                     |      |                                                                                                                                                                                                                                                                                                                                                                    |               |  |  |  |  |

|     |                |  |          |                                                                                                                                                                                                                                 |  |  |  |  |  |  |
|-----|----------------|--|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|     | Lateral Limits |  | Distance | Lateral limits of the sectors                                                                                                                                                                                                   |  |  |  |  |  |  |
|     | Vertical Limit |  | Altitude | Area Minimum Altitude (AMA) - The minimum altitude to be used under instrument meteorological conditions (IMC), that provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians. |  |  |  |  |  |  |
| MVA |                |  |          |                                                                                                                                                                                                                                 |  |  |  |  |  |  |
|     | Lateral Limits |  | Distance | Lateral limits of the sectors                                                                                                                                                                                                   |  |  |  |  |  |  |
|     | Vertical Limit |  | Altitude | Minimum Vector Altitude                                                                                                                                                                                                         |  |  |  |  |  |  |

|         |               |         |                                                  |          |           |            |                      |              |
|---------|---------------|---------|--------------------------------------------------|----------|-----------|------------|----------------------|--------------|
| Note 1) | U) Upper      | Note 2) | Airway segments length                           | 1/10 km  | routine   | calculated | 1/10 km or 1/10 NM   | 1 km or 1 NM |
|         | K) Helicopter |         | Terminal arrival/departure route segments length | 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 | Accuracy | Integrity | Orig Type           | Pub. Res. | Chart Res. |
|----------|----------------|--------------|-------|---------------------------------------------------------------------------|------|----------|-----------|---------------------|-----------|------------|
| Waypoint |                |              |       |                                                                           |      |          |           |                     |           |            |
|          | Identification |              | Text  | Names, coded designators or name-codes assigned to the significant point. |      |          |           |                     |           |            |
|          | Position       |              | Point | Geographical location of the waypoint                                     |      | 100 m    | essential | surveyed calculated | 1 sec     | 1 sec      |

|  |           |          |          |                                                                                     |  |             |  |  |  |
|--|-----------|----------|----------|-------------------------------------------------------------------------------------|--|-------------|--|--|--|
|  | Formation |          |          |                                                                                     |  |             |  |  |  |
|  |           | Navaid   | Text     | The station identification of the reference VOR/DME                                 |  |             |  |  |  |
|  |           | Bearing  | Bearing  | The bearing from the reference VOR/DME, if the waypoint is not collocated with it.  |  | See Note 1. |  |  |  |
|  |           | Distance | Distance | The distance from the reference VOR/DME, if the waypoint is not collocated with it. |  | See Note 2. |  |  |  |

|         |                                                   |             |         |            |             |             |
|---------|---------------------------------------------------|-------------|---------|------------|-------------|-------------|
| Note 1. | Bearing used for the formation of an en-route fix | 1/10 degree | routine | calculated | 1/10 degree | 1/10 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) |
|---------|----------------------------------------------------|---------|---------|------------|--------------------|-------------------|

| Subject          | Property       | Sub-Property | Type    | Description                                                                                                     | Note | 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                                                                         |      |          |           |                     |           |            |
|                  | Fix            |              | Text    | Identification of the holding procedure fix                                                                     |      |          |           |                     |           |            |
|                  | Waypoint       |              | Point   | Geographical location of the holding waypoint                                                                   |      | 100m     | essential | surveyed calculated | 1 sec     | 1 sec      |
|                  | Inbound track  |              | Bearing | The inbound track of the holding procedure                                                                      |      |          |           |                     |           |            |
|                  | Turn Direction |              | Text    | Direction of the procedure turn                                                                                 |      |          |           |                     |           |            |

APP1-37

|                                 |                       |          |                                                            |                                                                                                                              |  |  |  |  |  |
|---------------------------------|-----------------------|----------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Speed                           |                       | Value    | Maximum indicated airspeed                                 |                                                                                                                              |  |  |  |  |  |
| Level                           |                       |          |                                                            |                                                                                                                              |  |  |  |  |  |
|                                 | Minimum holding level | Altitude | Minimum holding level of the holding procedure             |                                                                                                                              |  |  |  |  |  |
|                                 | Maximum holding level | Altitude | Maximum holding level of the holding procedure             |                                                                                                                              |  |  |  |  |  |
| Time/distance outbound          |                       | Value    | Time/distance value of the holding procedure               |                                                                                                                              |  |  |  |  |  |
| Controlling unit                |                       |          |                                                            |                                                                                                                              |  |  |  |  |  |
|                                 | Name                  | Text     | Indication of the controlling unit                         |                                                                                                                              |  |  |  |  |  |
|                                 | Frequency             | Value    | The operating frequency/channel of the controlling unit    |                                                                                                                              |  |  |  |  |  |
| Special holding entry procedure |                       | Text     | Textual description of the Special VOR/DME entry procedure | In case an entry radial to a secondary fix at the end of the outbound leg has been established for a VOR/DME holding pattern |  |  |  |  |  |

Table S1-4 Instrument flight procedure data

| Subject   | Property       | Sub-Property | Type      | Description                                                                                                                            | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|-----------|----------------|--------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Procedure | Identification |              |           |                                                                                                                                        |      |          |           |           |           |            |
|           |                | FAS Guidance | Code list | The name describing the type of radio navigation aid providing the final approach lateral guidance. This could be: ILS, VOR, RNAV, etc | APCH |          |           |           | –         | –          |
|           |                | Runway       | Text      | The runway designator of the landing and take-off direction. Examples: 27, 35L, 01R.                                                   |      |          |           |           |           |            |
|           |                | Circling     | Code list | Indication if a procedure is/ is not a circling approach                                                                               | APCH |          |           |           |           |            |
|           |                |              |           |                                                                                                                                        |      |          |           |           |           |            |

|                            |                    |           |                                                                                                                                                                                                                                                                   |           |  |  |  |  |  |
|----------------------------|--------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--|--|--|--|--|
|                            | 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:<br>VOR y Rwy 20<br>VOR z Rwy 20 | APCH      |  |  |  |  |  |
|                            | NS Limiter         | Text      | Sensor specific information in case of a limitation of use                                                                                                                                                                                                        | PBN only  |  |  |  |  |  |
|                            | Name               | Text      | Name of the instrument flight procedure                                                                                                                                                                                                                           |           |  |  |  |  |  |
| 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.                                                                                                                                        | SID, STAR |  |  |  |  |  |
|                            | Validity Indicator | Text      | The validity indicator shall be a number from 1 to 9.                                                                                                                                                                                                             | SID, STAR |  |  |  |  |  |
|                            | Route Indicator    | Text      | The route indicator shall be one letter of the alphabet. The letters "I" and "O" shall not be used.                                                                                                                                                               | SID, STAR |  |  |  |  |  |
|                            | Visual Indication  | Text      | Indication if the route has been established for use by aircraft operating in accordance with the visual flight rules (VFR)                                                                                                                                       | VFR only  |  |  |  |  |  |
| Coded Designation          |                    |           |                                                                                                                                                                                                                                                                   |           |  |  |  |  |  |
|                            | Significant Point  | Text      | The coded designator or name-code of the significant point                                                                                                                                                                                                        | SID, STAR |  |  |  |  |  |
|                            | Validity Indicator | Text      | The Validity Indicator of the procedure                                                                                                                                                                                                                           | SID, STAR |  |  |  |  |  |
|                            | Route Indicator    | Text      | The Route Indicator of the procedure                                                                                                                                                                                                                              | SID, STAR |  |  |  |  |  |
| Procedure Type             |                    | Code list | Indication of the type of procedure (departure, arrival, approach, other)                                                                                                                                                                                         |           |  |  |  |  |  |
| PBN or Conventional        |                    | Code list | Indication if the procedure is PBN or Conventional                                                                                                                                                                                                                | IFR only  |  |  |  |  |  |

|  |                    |                   |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |   |  |  |  |  |
|--|--------------------|-------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---|--|--|--|--|
|  | Precision Type     |                   | Text      | The instrument procedure type. Instrument approach procedures are classified as follows:<br>Non-precision approach (NPA) procedure. - An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance.<br>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.<br>Precision approach (PA) procedure. - An instrument approach procedure using precision lateral and vertical guidance with minima as determined by the category of operation. | APCH |   |  |  |  |  |
|  | Aircraft Category  |                   | Code list | Indication of which aircraft categories the procedure is intended for                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |   |  |  |  |  |
|  | Magnetic variation |                   | Angle     | The magnetic variation considered for the procedure design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |   |  |  |  |  |
|  | OCA/H              |                   |           | Obstacle clearance Altitude (Height)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | APCH | - |  |  |  |  |
|  |                    | Aircraft category | Code list | Aircraft category according to ICAO Doc 8168 Vol I or II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | APCH |   |  |  |  |  |
|  |                    | Approach type     | Code list | Approach type (e.g. Straight-in Cat I, Cat II, LLZ, Circling ...) or specific navigation aid (e.g. stepdown fixes), or a specific navigation specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | APCH |   |  |  |  |  |

|  |       |                   |           |                                                                                                                                                                                                |      |                          |           |  |  |                          |
|--|-------|-------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------|-----------|--|--|--------------------------|
|  |       | Altitude          | Altitude  | The lowest altitude used in establishing compliance with appropriate obstacle clearance criteria.                                                                                              | APCH | as specified in Doc 8168 | essential |  |  | as specified in Doc 8168 |
|  |       | Height            | Height    | 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. | APCH | as specified in Doc 8168 | essential |  |  | as specified in Doc 8168 |
|  | DA/H  |                   |           | Decision Altitude (Height)                                                                                                                                                                     | APCH |                          |           |  |  |                          |
|  |       | Aircraft category | Code list | Aircraft category according to ICAO Doc 8168 Vol I or II                                                                                                                                       | APCH |                          |           |  |  |                          |
|  |       | Approach type     | Code list | Approach type (e.g. Straight-in, Circling ...) or specific navigation aid (e.g. stepdown fixes), or a specific navigation specification                                                        | APCH |                          |           |  |  |                          |
|  |       | Altitude          | Altitude  | A specified altitude in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established     | APCH |                          |           |  |  |                          |
|  |       | Height            | Height    | A specified height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established       | APCH |                          |           |  |  |                          |
|  | MDA/H |                   |           | Minimum Descent Altitude (Height)                                                                                                                                                              | APCH |                          |           |  |  |                          |
|  |       | Aircraft category | Code list | Aircraft category according to ICAO Doc 8168 Vol I or II                                                                                                                                       | APCH |                          |           |  |  |                          |
|  |       | Approach type     | Code list | Approach type (e.g. Straight-in, Circling ...) or                                                                                                                                              | APCH |                          |           |  |  |                          |

|  |     |          |                                                                                       |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |  |  |  |  |
|--|-----|----------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
|  |     |          | specific navigation aid (e.g. stepdown fixes), or a specific navigation specification |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |  |  |  |  |
|  |     | Altitude | Altitude                                                                              | A specified altitude in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.                                                                                               | APCH                                                                                                                                                                                                                                                                |  |  |  |  |
|  |     | Height   | Height                                                                                | A specified height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.                                                                                                 | APCH                                                                                                                                                                                                                                                                |  |  |  |  |
|  | 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. | IFR only                                                                                                                                                                                                                                                            |  |  |  |  |
|  |     |          | Sector start angle                                                                    | Angle                                                                                                                                                                                                                                                               | Start angle of a sector                                                                                                                                                                                                                                             |  |  |  |  |
|  |     |          | Sector end angle                                                                      | Angle                                                                                                                                                                                                                                                               | End angle of a sector                                                                                                                                                                                                                                               |  |  |  |  |
|  |     |          | Based on Fix                                                                          | Text                                                                                                                                                                                                                                                                | Center of the MSA                                                                                                                                                                                                                                                   |  |  |  |  |
|  |     |          | Altitude                                                                              | Altitude                                                                                                                                                                                                                                                            | The minimum altitude for each sector                                                                                                                                                                                                                                |  |  |  |  |
|  |     |          | Restrictions                                                                          | Text                                                                                                                                                                                                                                                                | 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. |  |  |  |  |
|  |     |          | Radius                                                                                | Value                                                                                                                                                                                                                                                               | The radius of each sector                                                                                                                                                                                                                                           |  |  |  |  |
|  |     |          |                                                                                       |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |  |  |  |  |
|  |     |          |                                                                                       |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |  |  |  |  |
|  |     |          |                                                                                       |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                     |  |  |  |  |

|               |                    |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |  |  |  |  |  |
|---------------|--------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--|--|--|--|--|
| 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), 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. | APCH, PBN only |  |  |  |  |  |
|               | Reference point    | Text     | TAA reference point (IAF or IF)                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |  |  |  |  |  |
|               | IAF                | Text     | TAA Initial Approach Fix reference point                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |  |  |
|               | IF                 | Text     | TAA Intermediate Fix reference point                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |  |  |  |  |  |
|               | Dist To IAF        | Distance | The distance of the TAA area boundary from the IAF                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |  |  |  |  |  |
|               | Altitude           | Altitude | The terminal arrival altitude value                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |  |  |  |  |  |
|               | Sector start angle | Angle    | Start angle of a sector (bearing to TAA reference point)                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |  |  |  |  |  |
|               | Sector end angle   | Angle    | End angle of a sector (bearing to TAA reference point)                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |  |  |  |  |  |
|               | Stepdown arc       | Distance | Radius of inner area with lower altitude.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |  |  |  |  |  |
| 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                                                                                                                                                                                                                    | PBN only       |  |  |  |  |  |

|  |                  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |  |  |  |  |  |
|--|------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--|--|--|--|--|
|  |                  |      | on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.<br>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.                                                                                                                                                                                                                                                                                                                                              |           |  |  |  |  |  |
|  | Operating minima | Text | Aerodrome Operating Minima - The limits of usability of an aerodrome for:<br>a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;<br>b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation;<br>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<br>d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum | APCH, DEP |  |  |  |  |  |

|  |                         |                               |                                                                     |                                                                                                                                                                                             |                 |  |  |  |  |
|--|-------------------------|-------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|--|--|--|
|  |                         |                               | descent altitude/height (MDA/H) and, if necessary, cloud conditions |                                                                                                                                                                                             |                 |  |  |  |  |
|  | Temperature             |                               |                                                                     |                                                                                                                                                                                             |                 |  |  |  |  |
|  |                         | Minimum temperature           | Value                                                               | Minimum temperature reference                                                                                                                                                               | APCH, PBN only  |  |  |  |  |
|  |                         | Maximum temperature           | Value                                                               | Maximum temperature reference                                                                                                                                                               | APCH, PBN only  |  |  |  |  |
|  | Remote Altimeter Source |                               | Text                                                                | Cautionary note indicating the altimetry source                                                                                                                                             | APCH            |  |  |  |  |
|  | Proc Ref Datum          |                               | Text                                                                | Airport or landing threshold                                                                                                                                                                | APCH            |  |  |  |  |
|  | PBN Requirements        |                               |                                                                     | Specific requirements related to a PBN procedure                                                                                                                                            | PBN             |  |  |  |  |
|  |                         | Navigation specification      | Code list                                                           | Identification of the navigation specification (RNAV 5, PBN 0.3 ...)                                                                                                                        |                 |  |  |  |  |
|  |                         | Navigation sensor limitations | Text                                                                | Any navigation sensor limitations (GNSS required ...)                                                                                                                                       |                 |  |  |  |  |
|  |                         | Functional requirements       | Text                                                                | Any required functionalities that are described as options in the navigation specification, that is, not included in the core navigation specification (RF required ...)                    |                 |  |  |  |  |
|  | Procedure Segment       |                               |                                                                     |                                                                                                                                                                                             | SID, STAR, APCH |  |  |  |  |
|  | Start                   |                               | Text                                                                | Identification of the start point of the segment                                                                                                                                            |                 |  |  |  |  |
|  | End                     |                               | Text                                                                | Identification of the end point or a description of the end of the segment                                                                                                                  |                 |  |  |  |  |
|  | End fix functionality   |                               | Code list                                                           | Indication if the end fix is a fly-by point (A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure) or fly-over point (A | PBN             |  |  |  |  |

|                           |      |                 |                                                                                                                                                                                                                                 |                                       |                          |           |            |                      |                          |
|---------------------------|------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------|-----------|------------|----------------------|--------------------------|
|                           |      |                 | waypoint at which a turn is initiated in order to join the next segment of a route or procedure)                                                                                                                                |                                       |                          |           |            |                      |                          |
| End fix role              |      | Code list       | Indication of the role of the end fix (MAPt, IF, IAF, FAF, MAHF...)                                                                                                                                                             |                                       |                          |           |            |                      |                          |
| Procedure altitude/height |      | Altitude/Height | A specified altitude/height flown operationally a foot above the minimum altitude/height and established to accommodate a stabilized descent at a prescribed descent gradient/angle in the intermediate/final approach segment. | SID, STAR, APCH certain segments only | as specified in Doc 8168 | essential |            |                      | as specified in Doc 8168 |
| MOCA                      |      | Altitude        | The minimum altitude for a defined segment that provides the required obstacle clearance.                                                                                                                                       | SID, STAR, APCH                       |                          |           |            |                      |                          |
| Distance                  |      | Distance        | Geodesic distance to the nearest tenth of a kilometer or tenth of a nautical mile between each successive designated significant point;                                                                                         |                                       | 1/100 km                 | essential | calculated | 1/100 km or 1/100 NM | 1 km or 1 NM             |
| True bearing              |      | Bearing         | True track to the nearest tenth of a degree to the nearest degree between each successive significant point;                                                                                                                    | SID, STAR, APCH                       | 1/10 degree              | routine   | calculated | 1/10 degree          | 1 degree                 |
| Magnetic bearing          |      | Bearing         | Magnetic track to the nearest tenth of a degree to the nearest degree between each successive significant point;                                                                                                                | SID, STAR, APCH                       | 1/10 degree              | routine   | calculated | 1 degree             | 1 degree                 |
| Gradient                  |      | Value           |                                                                                                                                                                                                                                 | APCH, DEP                             |                          |           |            |                      |                          |
| Speed                     |      | Value           | Speed limit at a significant point, expressed in units of 10 knots applicable                                                                                                                                                   |                                       |                          |           |            |                      |                          |
| Controlling obstacle      |      |                 |                                                                                                                                                                                                                                 | APCH, DEP                             |                          |           |            |                      |                          |
|                           | Type | Text            | Indication if the obstacle is lit/unlit, type of obstacle (church/wind turbine,...)                                                                                                                                             |                                       |                          |           |            |                      |                          |

|                        |                                 |                               |           |                                                                                                                                                                          |                              |                |  |  |  |  |
|------------------------|---------------------------------|-------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------|--|--|--|--|
|                        |                                 | Position                      | Point     | Coordinates of the controlling obstacle                                                                                                                                  |                              | see obstacle s |  |  |  |  |
|                        |                                 | Elevation:                    | Elevation | Elevation of the top of the controlling obstacle                                                                                                                         |                              | see obstacle s |  |  |  |  |
|                        | PNB Requirements                |                               |           | Specific requirements related to a PBN procedure segment                                                                                                                 | PBN                          |                |  |  |  |  |
|                        |                                 | Navigation specification      | Code list | Identification of the navigation specification (RNAV 5, PBN 0.3 ...)                                                                                                     |                              |                |  |  |  |  |
|                        |                                 | Navigation sensor limitations | Text      | Any navigation sensor limitations (GNSS required ...)                                                                                                                    |                              |                |  |  |  |  |
|                        |                                 | Functional requirements       | Text      | Any required functionalities that are described as options in the navigation specification, that is, not included in the core navigation specification (RF required ...) |                              |                |  |  |  |  |
| Final Approach Segment |                                 |                               |           | That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.                                                            | SBAS<br>APCH<br>GBAS<br>APCH |                |  |  |  |  |
|                        | Operation type                  |                               | Text      | A number that indicates the type of the final approach segment (e.g "0" is coded for a straight-in approach procedure including offset procedures.)                      |                              |                |  |  |  |  |
|                        | Approach performance designator |                               | Text      | A number that identifies the type of an approach. ("0" is used to identify an LPV approach procedure and a "1" indicates a Category I approach procedure)                |                              |                |  |  |  |  |
|                        | SBAS provider                   |                               | Text      | Identifier of a particular satellite-based approach system service provider                                                                                              | SBAS only                    |                |  |  |  |  |
|                        | RPDS                            |                               | Text      | Reference path data selector (RPDS) - A numerical identifier that is unique on a frequency in the broadcast region                                                       | GBAS only                    |                |  |  |  |  |

|                           |                    |           |                                                                                                                                                       |  |              |          |            |                   |  |
|---------------------------|--------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|----------|------------|-------------------|--|
|                           |                    |           | and used to select the FAS data block.                                                                                                                |  |              |          |            |                   |  |
| RPI                       |                    | Text      | Reference Path Identifier - A four-character identifier that is used to confirm selection of the correct approach procedure.                          |  |              |          |            |                   |  |
| LTP/FTP                   |                    |           | Landing threshold point (LTP) or fictitious threshold point (FTP)                                                                                     |  |              |          |            |                   |  |
|                           | Position           | Point     | Latitude and Longitude of the LTP/FTP                                                                                                                 |  | 0.3 m (1 ft) | critical |            | 0.000 5" (0.01" ) |  |
|                           | Ellipsoid height   | Elevation | The height of the LTP/FTP above the WGS-84 ellipsoid                                                                                                  |  | 0.25 m       | critical |            | 0.1 m             |  |
|                           | Orthometric height | Elevation | The height of the LTP/FTP as related to the geoid and presented as an MSL elevation                                                                   |  |              |          |            |                   |  |
| FPAP                      |                    |           | Flight path alignment point (FPAP)                                                                                                                    |  |              |          |            |                   |  |
|                           | Position           | Point     | Latitude and Longitude of the FPAP                                                                                                                    |  | 0.3 m (1 ft) | critical |            | 0.000 5" (0.01" ) |  |
|                           | Orthometric height | Elevation | The height of the FPAP as related to the geoid and presented as an MSL elevation                                                                      |  |              |          |            |                   |  |
| TCH                       |                    | Height    | Approach Threshold Crossing Height (TCH) - The designated crossing height of the flight path angle above the LTP (or FTP).                            |  | 0.5 m        | critical | calculated | 0.05 m            |  |
| GPA                       |                    | Value     | Glide Path Angle (GPA) - The angle of the approach path (glide path) with respect to the horizontal plane defined according to WGS-84 at the LTP/FTP. |  | 0.01°        | N/A      |            | 0.01°             |  |
| Course Width at threshold |                    | Value     | The semi-width of the lateral course width at the LTP/FTP, defining the lateral offset at which the receiver will achieve full-scale deflection.      |  | N/A          | critical |            | 0.25 m            |  |
| Delta Length Offset       |                    | Distance  | The distance from the stop end of the runway to the FPAP. It defines the location where                                                               |  | N/A          | N/A      |            | 8 m               |  |

|  |                |  |       |                                                                                                                                                                                                                                             |           |  |  |  |  |  |
|--|----------------|--|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--|--|--|--|--|
|  |                |  |       | lateral sensitivity changes to the missed approach sensitivity.                                                                                                                                                                             |           |  |  |  |  |  |
|  | HAL            |  | Value | Horizontal Alert Limit                                                                                                                                                                                                                      | SBAS only |  |  |  |  |  |
|  | VAL            |  | Value | Vertical Alert Limit                                                                                                                                                                                                                        | SBAS only |  |  |  |  |  |
|  | FAS Data Block |  | Text  | Binary string describing the Final Approach Segment (FAS) data block generated with an appropriate software tool. The FAS data block is set of parameters to identify a single precision approach or APV and define its associated approach |           |  |  |  |  |  |
|  | CRC Remainder  |  | Text  | An 8-character hexadecimal representation of the calculated remainder bits used to determine the integrity of the FAS data block data during transmission and storage.                                                                      |           |  |  |  |  |  |

| Subject       | Property                   | Sub-Property | Type  | Description                                                                       | Note | Accuracy    | Integrity | Orig Type | Pub. Res. | Chart Res. |
|---------------|----------------------------|--------------|-------|-----------------------------------------------------------------------------------|------|-------------|-----------|-----------|-----------|------------|
| Procedure Fix |                            |              |       |                                                                                   |      |             |           |           |           |            |
|               | Identification             |              | Text  | Names, coded designators or name-codes assigned to the significant point.         |      |             |           |           | –         | –          |
|               | ATC Reporting requirements |              | Text  | Indication of ATS / MET reporting requirement "compulsory", "on-request" or "nil" |      |             |           |           |           |            |
|               | VFR Reporting point        |              | Text  | Bridge, Church Name                                                               | VFR  |             |           |           |           |            |
|               | Position                   |              | Point | Geographical location of the fix                                                  |      | See Note 1. |           |           |           |            |

|            |          |          |                                                                                     |  |             |           |            |                      |                   |
|------------|----------|----------|-------------------------------------------------------------------------------------|--|-------------|-----------|------------|----------------------|-------------------|
| Type       |          | Text     | Indication of the type of fix, such as: Navaid, Int, WPT                            |  |             |           |            |                      |                   |
| Formations |          |          |                                                                                     |  |             |           |            |                      |                   |
|            | Navaid   | Text     | The station identification of the reference VOR/DME                                 |  |             |           |            |                      |                   |
|            | Bearing  | Bearing  | The bearing from the reference VOR/DME, if the waypoint is not collocated with it.  |  | See Note 2. |           |            |                      |                   |
|            | Distance | Distance | The distance from the reference VOR/DME, if the waypoint is not collocated with it. |  | 1/100 km    | essential | calculated | 1/100 km or 1/100 NM | 2/10 km (1/10 NM) |
|            |          |          |                                                                                     |  | See Note 3. |           |            |                      |                   |

|         |                                                                                                           |       |           |                       |          |       |
|---------|-----------------------------------------------------------------------------------------------------------|-------|-----------|-----------------------|----------|-------|
| Note 1. | En-route navaids and fixes, holding, STAR/SID points                                                      | 100 m | essential | surveyed / calculated | 1 sec    | 1 sec |
|         | Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure | 3 m   | essential | surveyed / calculated | 1/10 sec | 1 sec |

|         |                                                                        |              |           |            |              |             |
|---------|------------------------------------------------------------------------|--------------|-----------|------------|--------------|-------------|
| Note 2. | Bearing used for the formation 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 | 1/10 degree |

|         |                                                                                     |          |           |            |                      |                   |
|---------|-------------------------------------------------------------------------------------|----------|-----------|------------|----------------------|-------------------|
| Note 3. | 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 | 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. |      |                  |           |           |                    |            |
|                   | Identification  |              | Text     | Identification of the holding procedure                                                                         |      |                  |           |           |                    |            |
|                   | Fix             |              | Point    | Geographical location that serves as a reference for a holding procedure.                                       |      | same as proc fix |           |           |                    |            |
|                   | Inbound course  |              | Angle    | Inbound true course                                                                                             |      |                  |           |           | 1/10 degree        |            |
|                   | Outbound course |              | Angle    | Outbound true course                                                                                            |      |                  |           |           | 1/10 degree        |            |
|                   | Leg distance    |              | Distance | Outbound distance of the leg                                                                                    |      |                  |           |           | 1/10 km or 1/10 NM |            |

|                    |  |          |                                                                                                                                                              |                                                                       |      |         |            |                             |  |
|--------------------|--|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------|---------|------------|-----------------------------|--|
| Leg time           |  | Value    | Outbound time of the leg                                                                                                                                     |                                                                       |      |         |            |                             |  |
| Limiting radial    |  | Angle    | Limiting radial from the VOR/DME on which the holding is based                                                                                               |                                                                       |      |         |            |                             |  |
| Turn direction     |  | Value    | Direction of the procedure turn                                                                                                                              |                                                                       |      |         |            |                             |  |
| Minimum altitude   |  | Altitude | Minimum holding level to the nearest higher 50 m or 100 ft/flight level                                                                                      |                                                                       | 50 m | routine | calculated | 50 m or 100 ft/flight level |  |
| Maximum altitude   |  | Altitude | Maximum holding level to the nearest higher 50 m or 100 ft/flight level                                                                                      |                                                                       |      |         |            | 50 m or 100 ft/flight level |  |
| Speed              |  | Value    | Maximum indicated air speed                                                                                                                                  |                                                                       |      |         |            | 10 kts                      |  |
| Magnetic variation |  |          |                                                                                                                                                              |                                                                       |      |         |            |                             |  |
|                    |  | Angle    | Angle                                                                                                                                                        | The magnetic variation of the radio navigation aid of the procedure   |      |         |            |                             |  |
|                    |  | Date     | Date                                                                                                                                                         | The date on which the magnetic variation had the corresponding value. |      |         |            |                             |  |
| Nav Spec Name      |  | Text     | Name of the Navigation Specification - set of aircraft and aircrew requirements needed to support a navigation application within a defined airspace concept | RNAV/RNP                                                              |      |         |            |                             |  |

| Subject                        | Property                              | Sub-Property | Type | Description                                | Note | Accuracy | Integrity | Orig Type | Publ. Res. | Chart Res |
|--------------------------------|---------------------------------------|--------------|------|--------------------------------------------|------|----------|-----------|-----------|------------|-----------|
| Helicopter Procedure Specifics |                                       |              |      |                                            |      |          |           |           |            |           |
|                                | Helicopter Procedure Title (RNAV 263) |              | Text | Identification of the helicopter procedure |      |          |           |           |            |           |

|                       |  |                     |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
|-----------------------|--|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|------------|-------------|-------------|
| HCH                   |  | Height              | Heliport crossing height                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                            | 0.5 m    | essential | calculated | 1 m or 1 ft | 1 m or 1 ft |
| IDF                   |  | Point               | Initial departure fix                                                                                                                                                                                                                                                                                                                                                                         | DEP                                                                                                                                                                                                                                                                                                                                                                                        |          |           |            |             |             |
| MAPt                  |  | Point               | Missed Approach Point                                                                                                                                                                                                                                                                                                                                                                         | APCH                                                                                                                                                                                                                                                                                                                                                                                       |          |           |            |             |             |
| Direct Visual Segment |  |                     | For PinS APP: the portion of flight that connects directly the PinS to the landing location.<br>For PinS DEP: the portion of flight that connects directly the landing location to the IDF                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
|                       |  | Track               | Line                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
|                       |  | Distance            | Distance                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
|                       |  | Bearing             | Angle                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
|                       |  | Crossing height     | Height                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                            |          |           |            |             |             |
| Manoeuvring VS        |  |                     | Manoeuvring Visual Segment - PinS visual segment protected for the following manoeuvres:<br>For PinS APCH: Visual manoeuvre from the MAPt around the heliport or landing location to land from a direction other than directly from the MAPt.<br>For PinS DEP: Take-off in a direction other than directly to the IDF followed by visual manoeuvre to join the instrument segment at the IDF. | APCH DEP                                                                                                                                                                                                                                                                                                                                                                                   |          |           |            |             |             |
|                       |  | Center line         | Angle                                                                                                                                                                                                                                                                                                                                                                                         | Centre line of take-off climb surface                                                                                                                                                                                                                                                                                                                                                      | DEP      |           |            |             |             |
|                       |  | Manoeuvring Area    | Polygon                                                                                                                                                                                                                                                                                                                                                                                       | Area where the pilot is expected to manoeuvre visually                                                                                                                                                                                                                                                                                                                                     | APCH DEP |           |            |             |             |
|                       |  | No Manoeuvring Area | Polygon                                                                                                                                                                                                                                                                                                                                                                                       | Area where manoeuvring is prohibited                                                                                                                                                                                                                                                                                                                                                       | APCH DEP |           |            |             |             |
|                       |  | Ingress Tracks      | Line                                                                                                                                                                                                                                                                                                                                                                                          | Manoeuvring Visual Segment - PinS visual segment protected for the following manoeuvres: For PinS APCH: Visual manoeuvre from the MAPt around the heliport or landing location to land from a direction other than directly from the MAPt.<br>For PinS DEP: Take-off in a direction other than directly to the IDF followed by visual manoeuvre to join the instrument segment at the IDF. | APCH DEP |           |            |             |             |

|  |                       |          |                                                                     |      |  |  |  |  |  |
|--|-----------------------|----------|---------------------------------------------------------------------|------|--|--|--|--|--|
|  | HAS                   |          | Height above surface diagram                                        | APCH |  |  |  |  |  |
|  | Radius                | Distance |                                                                     |      |  |  |  |  |  |
|  | Height above Surface  | Height   |                                                                     |      |  |  |  |  |  |
|  | Proceed Visually Text | Text     | Text indicating that the procedure has Proceed Visually instruction |      |  |  |  |  |  |
|  | Proceed VFR Text      | Text     | Text indicating that the procedure has Proceed VFR instruction      |      |  |  |  |  |  |
|  | VSDA                  | Value    | Visual segment descent angle                                        |      |  |  |  |  |  |
|  | Ingress Tracks        |          |                                                                     |      |  |  |  |  |  |
|  | Length                | Distance |                                                                     |      |  |  |  |  |  |
|  | Width                 | Distance |                                                                     |      |  |  |  |  |  |
|  | Bearing               | Angle    |                                                                     |      |  |  |  |  |  |

| Subject | Property                                                  | Sub-Property | Type  | Description                                                                                                                            | Note | Accuracy | Integrity | Orig Type |
|---------|-----------------------------------------------------------|--------------|-------|----------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|
| AIF     |                                                           |              |       | Notes on charts (Aeronautical Information in Textual Format)                                                                           |      |          |           |           |
|         | Non-align between Instrument and Visual Slope Indications |              | Text  |                                                                                                                                        |      |          |           |           |
|         | Missed Approach Description                               |              | Text  | Missed approach description for the procedure                                                                                          |      |          |           |           |
|         | SID/STAR Route Description                                |              | Text  | Textual description of the SID or STAR procedure                                                                                       |      |          |           |           |
|         | Missed Apch Climb Gradient                                |              | Value | The value of the missed approach climb gradient for the approach procedure                                                             |      |          |           |           |
|         | CAT H Note                                                |              | Text  |                                                                                                                                        |      |          |           |           |
|         | CAT D Large                                               |              | Text  |                                                                                                                                        |      |          |           |           |
|         | Authorization Required                                    |              | Text  | Indication that RNP AR                                                                                                                 |      |          |           |           |
|         | Units of Measure                                          |              | Text  |                                                                                                                                        |      |          |           |           |
|         | GNSS In-Lieu-Of                                           |              | Text  |                                                                                                                                        |      |          |           |           |
|         | Comm Failure                                              |              | Text  | Communication failure description                                                                                                      |      |          |           |           |
|         | Surveillance/Radar Required                               |              | Text  |                                                                                                                                        |      |          |           |           |
|         | SID Close-in Obstacle Note                                |              | Text  | Indication wherever close-in obstacles exist which were not considered in the determination of the published procedure design gradient |      |          |           |           |
|         | Off-Set Alignment                                         |              | Text  |                                                                                                                                        |      |          |           |           |
|         | PDG greater than 3%                                       |              | Text  |                                                                                                                                        |      |          |           |           |

Table S1-5 Radio navigation aids/systems data;

| Subject              | Property                           | Sub-Property | Type      | Description                                                                                                | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|----------------------|------------------------------------|--------------|-----------|------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Radio navigation aid |                                    |              |           |                                                                                                            |      |          |           |           |           |            |
|                      | Type                               |              | Text      | Type of radio navigation aid                                                                               |      |          |           |           |           |            |
|                      | Identification                     |              | Text      | The code assigned to uniquely identify the navaid                                                          |      |          |           |           |           |            |
|                      | Name                               |              | Text      | The textual name assigned to the navaid                                                                    |      |          |           |           |           |            |
|                      | ILS facility classification        |              | Code list | A classification based on the functional and performance capabilities of an ILS                            | ILS  |          |           |           |           |            |
|                      | GBAS facility classification       |              | Code list | A classification based on the functional and performance capabilities of the GBAS ground subsystem         | GBAS |          |           |           |           |            |
|                      | GBAS approach facility designation |              | Code list | A classification based on the GBAS service volume and performance requirements for each supported approach | GBAS |          |           |           |           |            |
|                      | Purpose                            |              | Code list | Indication whether navigation aid serves en-route (E), aerodrome (A) or dual (AE) purposes.                |      |          |           |           |           |            |
|                      | Aerodrome/heliport served          |              | Text      | The ICAO location indicator or name of the aerodrome/heliport served                                       |      |          |           |           |           |            |
|                      | Runway served                      |              | Text      | Designator of the runway served                                                                            |      |          |           |           |           |            |
|                      | Operating authority                |              | Text      | Name of the operating authority of the facility                                                            |      |          |           |           |           |            |
|                      | Type of supported ops              |              | Code list | Indication of the type of supported operation for ILS/MLS and GBAS                                         |      |          |           |           |           |            |
|                      | Co-location                        |              | Text      | Information that a navaid is co-located with another navaid                                                |      |          |           |           |           |            |

|                        |         |           |                                                                                                                                       |               |             |           |          |                        |          |  |
|------------------------|---------|-----------|---------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|-----------|----------|------------------------|----------|--|
| Hours of operation     |         | Schedule  | The hours of operation of the radio navigation aid                                                                                    |               |             |           |          |                        |          |  |
| Magnetic variation     |         |           | The angular difference between True North and Magnetic North                                                                          |               |             |           |          |                        |          |  |
|                        | Angle   | Angle     | The magnetic variation at the radio navigation aid                                                                                    | ILS/NDB       | See Note 1) |           |          |                        |          |  |
|                        | Date    | Date      | The date on which the magnetic variation had the corresponding value.                                                                 |               |             |           |          |                        |          |  |
| Station declination    |         | Angle     | An alignment variation of the navaid between the zero degree radial and true north, determined at the time the station is calibrated. | VOR/ILS/M LS  |             |           |          |                        |          |  |
| Zero bearing direction |         | Text      | Direction of the 'zero bearing' provided by the station. For example: magnetic north, true north                                      | VOR           |             |           |          |                        |          |  |
| Frequency              |         | Value     | Frequency or tuning frequency of the radio navigation aid                                                                             |               |             |           |          |                        |          |  |
| Channel                |         | Text      | The channel number of the radio navigation aid                                                                                        | DME           |             |           |          |                        |          |  |
| Position               |         | Point     | Geographical location of the radio navigation aid                                                                                     |               | See Note 2) |           |          |                        |          |  |
| Elevation              |         | Elevation | The elevation of the transmitting antenna of DME<br>The elevation of GBAS reference point                                             | DME<br>GBAS   | See Note 3) |           |          |                        |          |  |
| Ellipsoidal height     |         | Height    | The ellipsoid height of the GBAS reference point,                                                                                     | GBAS          |             |           |          |                        |          |  |
| Localizer alignment    |         |           |                                                                                                                                       |               |             |           |          |                        |          |  |
|                        | Bearing | Bearing   | The localizer course                                                                                                                  | ILS Localizer | 1/100 deg   | essential | surveyed | 1/100 degree (if true) | 1 degree |  |
|                        | Type    | Text      | Type of localizer alignment, true or magnetic                                                                                         | ILS Localizer |             |           |          |                        |          |  |

| Zero azimuth alignment               |  | Bearing   | MLS zero azimuth alignment                                                                                                                                                    | MLS           | 1/100 deg | essential | surveyed   | 1/100 degree (if true) | 1 degree          |
|--------------------------------------|--|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|-----------|------------|------------------------|-------------------|
| Angle                                |  | Angle     | The angle of the glide path of an ILS or the normal glide path angle for the MLS installation                                                                                 | ILS GP /MLS   |           |           |            |                        |                   |
| RDH                                  |  | Value     | The value of the ILS Reference Datum Height (ILS RDH).                                                                                                                        | ILS GP        | 0.5m      | critical  | calculated | 0.1m or 0.1ft          | 0.5m or 1ft       |
| Localizer antenna rwy end distance   |  | Distance  | ILS localizer runway/FATO end distance                                                                                                                                        | ILS Localizer | 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        | 3 m       | routine   | calculated | 1 m or 1 ft            | as plotted        |
| ILS marker TRSH distance             |  | Distance  | ILS marker - threshold distance                                                                                                                                               | ILS           | 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           | 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           | 3 m       | routine   | calculated | 1 m or 1 ft            | as plotted        |
| MLS elevation antenna TRSH distance  |  | Distance  | MLS elevation antenna - threshold distance along centre line                                                                                                                  | MLS           | 3 m       | routine   | calculated | 1 m or 1 ft            | as plotted        |
| MLS DME antenna TRSH distance        |  | Distance  | MLS DME/P antenna - threshold distance along centre line                                                                                                                      | MLS           | 3 m       | essential | calculated | 1 m or 1 ft            | as plotted        |
| Signal polarization                  |  | Code list | GBAS signal polarization (GBAS/H or GBAS/E)                                                                                                                                   | GBAS          |           |           |            |                        |                   |
| DOC                                  |  | Text      | Designated operational coverage (DOC or standard service volume SSV) as range or service volume radius from the navaid / GBAS reference point, height and sectors if required |               |           |           |            |                        |                   |

|         |                   |                      |                      |                      |                      |  |
|---------|-------------------|----------------------|----------------------|----------------------|----------------------|--|
| Note 1) | ILS Localizer NDB | 1 degree<br>1 degree | essential<br>routine | surveyed<br>surveyed | 1 degree<br>1 degree |  |
|---------|-------------------|----------------------|----------------------|----------------------|----------------------|--|

|         |                  |       |           |          |          |            |
|---------|------------------|-------|-----------|----------|----------|------------|
| Note 2) | Aerodrome Navaid | 3 m   | essential | surveyed | 1/10 sec | as plotted |
|         | GBAS Ref Point   | 1 m   |           |          |          |            |
|         | Enroute          | 100 m | essential | surveyed | 1 sec    |            |

|         |                |             |           |          |               |               |
|---------|----------------|-------------|-----------|----------|---------------|---------------|
| Note 3) | DME            | 30m (100ft) | essential | surveyed | 30 m (100 ft) | 30 m (100 ft) |
|         | DME/P          | 3 m         | essential | surveyed | 3 m (10 ft)   |               |
|         | GBAS Ref Point | 0.25 m      | essential |          | 1 m or 1 ft   |               |

| Subject | Property            | Sub-Property | Type    | Description                                                                                                                                                                                                                                                  | Note           | 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.)                                                                                                                                                                                   |                |          |           |           |           |            |
|         | Frequency           |              | Value   | Frequency of the GNSS                                                                                                                                                                                                                                        | as appropriate |          |           |           |           |            |
|         | Service area        |              | Polygon | Geographical location of the GNSS service area                                                                                                                                                                                                               |                |          |           |           |           |            |
|         | Coverage area       |              | Polygon | Geographical location of the GNSS coverage area                                                                                                                                                                                                              |                |          |           |           |           |            |
|         | Operating authority |              | Text    | Name of the operating authority of the facility                                                                                                                                                                                                              |                |          |           |           |           |            |

| Subject                    | Property | Sub-Property | Type | Description                                                                                                                    | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|----------------------------|----------|--------------|------|--------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Aeronautical ground lights |          |              |      | Ground lights and other light beacons designating geographical positions which are selected by the State as being significant. |      |          |           |           |           |            |

|               |                     |  |          |                                                                    |  |  |  |              |  |  |
|---------------|---------------------|--|----------|--------------------------------------------------------------------|--|--|--|--------------|--|--|
|               | Type                |  | Text     | Type of beacon                                                     |  |  |  |              |  |  |
|               | Designator          |  | Text     | The code assigned to uniquely identify to the beacon               |  |  |  |              |  |  |
|               | Name                |  | Text     | The name of the city or town or other identification of the beacon |  |  |  |              |  |  |
|               | Intensity           |  | Value    | Intensity of the light of the beacon                               |  |  |  | 1000 candela |  |  |
|               | Characteristics     |  | Text     | Information about the characteristics of beacon                    |  |  |  |              |  |  |
|               | Hours of operations |  | Schedule | The hours of operation of the beacon                               |  |  |  |              |  |  |
|               | Position            |  | Point    | Geographical location of the beacon                                |  |  |  |              |  |  |
| Marine lights |                     |  |          |                                                                    |  |  |  |              |  |  |
|               | Position            |  | Point    | Geographical location of the beacon                                |  |  |  |              |  |  |
|               | Visibility range    |  | Distance | The visibility range of the beacon                                 |  |  |  |              |  |  |
|               | Characteristics     |  | Text     | Information about the characteristics of the beacon                |  |  |  |              |  |  |

| Subject                   | Property            | Sub-Property | Type     | Description                                                                                                   | Note | Accuracy | Integrity | Orig Type             | Pub. Res. | Chart Res. |
|---------------------------|---------------------|--------------|----------|---------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------------------|-----------|------------|
| Special navigation system |                     |              |          | Stations associated with special navigation systems (DECCA, LORAN, etc.).                                     |      |          |           |                       |           |            |
|                           | Type                |              | Text     | Type of service available (master signal, slave signal, colour).                                              |      |          |           |                       |           |            |
|                           | Designator          |              | Text     | The code assigned to uniquely identify to the special navigation system                                       |      |          |           |                       |           |            |
|                           | Name                |              | Text     | The textual name assigned to the special navigation system                                                    |      |          |           |                       |           |            |
|                           | Frequency           |              | Value    | Frequency (channel number, basic pulse rate, recurrence rate, as applicable) of the special navigation system |      |          |           |                       |           |            |
|                           | Hours of operations |              | Schedule | The hours of operation of the special navigation system                                                       |      |          |           |                       |           |            |
|                           | Position            |              | Point    | Geographical location of the special navigation system                                                        |      | 100m     | essential | surveyed / calculated |           |            |
|                           | Operating authority |              | Text     | Name of the operating authority of the facility                                                               |      |          |           |                       |           |            |
|                           | Facility coverage   |              | Text     | Description of special navigation system facility coverage                                                    |      |          |           |                       |           |            |

Table S1-6 Obstacle data

| Subj<br>ect | Prope<br>rty        | Sub-<br>Prop<br>erty | Type                     | Description                                                                       | Note | Accur<br>acy | Integ<br>rity | Orig<br>Type | Pub.<br>Res. | Chart<br>Res. |
|-------------|---------------------|----------------------|--------------------------|-----------------------------------------------------------------------------------|------|--------------|---------------|--------------|--------------|---------------|
| Obstacle    |                     |                      |                          | All fixed (whether temporary or permanent) and mobile obstacles or parts thereof. |      |              |               |              |              |               |
|             | Obstacle identifier |                      | Text                     | Unique identifier of obstacle                                                     |      |              |               |              |              |               |
|             | Operator / Owner    |                      | Text                     | Name and Contact information of obstacle operator or owner                        |      |              |               |              |              |               |
|             | Geometry type       |                      | Code list                | An indication whether the obstacle is a point, line or polygon.                   |      |              |               |              |              |               |
|             | Horizontal position |                      | Point<br>Line<br>Polygon | Horizontal position of obstacle                                                   |      | See Note 1)  |               |              |              |               |
|             | Horizontal extent   |                      | Distance                 | Horizontal extent of the obstacle                                                 |      |              |               |              |              |               |
|             | Elevation           |                      | Elevation                | Elevation of the highest point of the obstacle.                                   |      | See Note 2)  |               |              |              |               |
|             | Height              |                      | Height                   | Height of the obstacle above ground                                               |      |              |               |              |              |               |
|             | Type                |                      | Text                     | Type of obstacle                                                                  |      |              |               |              |              |               |
|             | Date and time stamp |                      | Date                     | Date and time the obstacle was created                                            |      |              |               |              |              |               |
|             | Operations          |                      | Text                     | Feature operations of mobile obstacles                                            |      |              |               |              |              |               |
|             | Effectivity         |                      | Text                     | Effectivity of temporary types of obstacles                                       |      |              |               |              |              |               |
|             | Lighting            |                      |                          |                                                                                   |      |              |               |              |              |               |
|             |                     | Type                 | Text                     | Type of lighting                                                                  |      |              |               |              |              |               |
|             |                     | Colour               | Text                     | Colour of the obstacle lighting                                                   |      |              |               |              |              |               |
|             | Marking             |                      | Text                     | Type of marking of obstacle                                                       |      |              |               |              |              |               |
|             | Material            |                      | Text                     | Predominant surface material of the obstacle                                      |      |              |               |              |              |               |

|         |                                                                                                            |      |           |          |          |            |
|---------|------------------------------------------------------------------------------------------------------------|------|-----------|----------|----------|------------|
| Note 1) | Obstacles in Area 1                                                                                        | 50 m | routine   | surveyed | 1 sec    | as plotted |
|         | Obstacles in Area 2 (including 2a, 2b, 2c, 2d, take-off flight path area and obstacle limitation surfaces) | 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    |
|         | Obstacles in Area 4                                                                                        | 2.5 m | essential | surveyed |                 |             |
| Note 2) | Obstacles in Area 1                                                                                        | 30 m  | routine   | surveyed | 1 m or 1 ft     | 3 m (10 ft) |
|         | Obstacles in Area 2 (including 2a, 2b, 2c, 2d, take-off flight path area and obstacle limitation surfaces) | 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 |
|         | Obstacles in Area 4                                                                                        | 1 m   | essential | surveyed | 0.1 m           |             |

Table S1-7 Geographic data

| Subject            | Property | Sub-Property | Type           | Description                                                                                                                                                                                                                                                                                                               | Note | Accuracy | Integrity | Orig Type | Pub. Res. | Chart Res. |
|--------------------|----------|--------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------|-----------|-----------|------------|
| Buildings          |          |              |                | Buildings (of operational significance) and other salient/prominent (aerodrome) features                                                                                                                                                                                                                                  |      |          |           |           |           |            |
|                    | Name     |              | Text           | Name of the building                                                                                                                                                                                                                                                                                                      |      |          |           |           |           |            |
|                    | Geometry |              | Polygon        | Geographical location of the building                                                                                                                                                                                                                                                                                     |      |          |           |           |           |            |
| Built up areas     |          |              |                | Areas covered by cities, towns and villages                                                                                                                                                                                                                                                                               |      |          |           |           |           |            |
|                    | Name     |              | Text           | Name of the build-up area                                                                                                                                                                                                                                                                                                 |      |          |           |           |           |            |
|                    | Geometry |              | Point/ Polygon | Geographical location of the build-up area                                                                                                                                                                                                                                                                                |      |          |           |           |           |            |
| Railroads          |          |              |                | All railroads having landmark value                                                                                                                                                                                                                                                                                       |      |          |           |           |           |            |
|                    | Name     |              | Text           | Name of the railroad                                                                                                                                                                                                                                                                                                      |      |          |           |           |           |            |
|                    | Geometry |              | Line           | Geographical location of the railroads                                                                                                                                                                                                                                                                                    |      |          |           |           |           |            |
| Highways and Roads |          |              |                | All highways and roads having landmark value                                                                                                                                                                                                                                                                              |      |          |           |           |           |            |
|                    | Name     |              | Text           | Name of highways and roads                                                                                                                                                                                                                                                                                                |      |          |           |           |           |            |
|                    | Geometry |              | Line           | Geographical location of highways and roads                                                                                                                                                                                                                                                                               |      |          |           |           |           |            |
| 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. |      |          |           |           |           |            |

|                      |                 |  |                  |                                                                                                                                                   |  |  |  |  |  |  |
|----------------------|-----------------|--|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|                      | Characteristics |  | Text             | Description of the landmark                                                                                                                       |  |  |  |  |  |  |
|                      | Geometry        |  | Point            | Geographical location of the landmark                                                                                                             |  |  |  |  |  |  |
| Political boundaries |                 |  |                  | International political boundaries                                                                                                                |  |  |  |  |  |  |
|                      | Geometry        |  | Line             | Geographical location of international political boundaries                                                                                       |  |  |  |  |  |  |
| Hydrography          |                 |  |                  | All water features comprising shore lines, lakes, rivers and streams (including those non-perennial in nature), salt lakes, glaciers and ice caps |  |  |  |  |  |  |
|                      | Name            |  | Text             | Name of the water feature                                                                                                                         |  |  |  |  |  |  |
|                      | Geometry        |  | Line/<br>Polygon | Geographical location of water feature                                                                                                            |  |  |  |  |  |  |
| Wooded areas         |                 |  |                  | Wooded areas                                                                                                                                      |  |  |  |  |  |  |
|                      | Geometry        |  | Polygon          | Geographical location of wooded area                                                                                                              |  |  |  |  |  |  |

| Subject                           | Property     | Sub-Property | Type    | Description                                                                               | Note | Accuracy | Integrity | Origin Type | Publication Res. | Chart Res. |
|-----------------------------------|--------------|--------------|---------|-------------------------------------------------------------------------------------------|------|----------|-----------|-------------|------------------|------------|
| Service roads                     |              |              |         | Part of aerodrome surface used by service vehicles                                        |      |          |           |             |                  |            |
|                                   | Geometry     |              | Polygon | Geographical location of the service roads                                                |      |          |           |             |                  |            |
|                                   | Feature base |              | Text    | Identification of the feature type affected                                               |      |          |           |             |                  |            |
|                                   | Id base      |              | Text    | Name of the underlying taxiway, parking stand area or apron                               |      |          |           |             |                  |            |
| Construction area                 |              |              |         | Part of aerodrome area under construction                                                 |      |          |           |             |                  |            |
|                                   | Geometry     |              | Polygon | Geographical location of the construction area                                            |      |          |           |             |                  |            |
| Aircraft movement unsuitable area |              |              |         | Areas unsuitable for aircraft movement                                                    |      |          |           |             |                  |            |
|                                   | Geometry     |              | Polygon | Depicted movement area permanently unsuitable for aircraft, clearly identified as such    |      |          |           |             |                  |            |
| Survey control point              |              |              |         | A monumented survey control point                                                         |      |          |           |             |                  |            |
|                                   | id number    |              | Text    | Special unique identifier permanently assigned to a feature instance by the data provider |      |          |           |             |                  |            |

|           |           |  |           |                                                                                                                |  |  |  |  |  |  |
|-----------|-----------|--|-----------|----------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|           | Location  |  | Point     | Geographical location of the survey control point                                                              |  |  |  |  |  |  |
|           | Elevation |  | Elevation | Elevation of survey control point                                                                              |  |  |  |  |  |  |
| ASRN node |           |  |           | A vertex in a graph defining the Aerodrome Surface Routing Network                                             |  |  |  |  |  |  |
|           | idnetwrk  |  | Text      | Logical name comprised of a delimited list of names for one or more features associated with this ASRN feature |  |  |  |  |  |  |
|           | idthr     |  | Text      | Name of feature instance                                                                                       |  |  |  |  |  |  |
|           | idnumber  |  | Text      | Special unique identifier permanently assigned to a feature instance by a data provider                        |  |  |  |  |  |  |
|           | termref   |  | Text      | Terminal building associated with the feature instance                                                         |  |  |  |  |  |  |
|           | nodetype  |  | Text      | Type of node                                                                                                   |  |  |  |  |  |  |
|           | catstop   |  | Text      | Low visibility operation category of holding position                                                          |  |  |  |  |  |  |
|           | Position  |  | Point     | Geographical location of the ASRN node                                                                         |  |  |  |  |  |  |
| ASRN edge |           |  |           | A connection between two nodes in a graph defining the Aerodrome Surface Routing Network                       |  |  |  |  |  |  |
|           | idnetwrk  |  | Text      | Logical name comprised of a delimited list of names for one or more features associated with this ASRN feature |  |  |  |  |  |  |
|           | direc     |  | Text      | Directionality of corresponding feature instance, which can be one-way or two-way                              |  |  |  |  |  |  |
|           | node1ref  |  | Text      | The idnumber of the ASRN Node corresponding to the start point of the edge geometry                            |  |  |  |  |  |  |
|           | node2ref  |  | Text      | The idnumber of the ASRN Node corresponding to the end point of the edge geometry                              |  |  |  |  |  |  |
|           | edgetype  |  | Text      | Type of edge                                                                                                   |  |  |  |  |  |  |
|           | edgederv  |  | Text      | Derivation method of edge geometry                                                                             |  |  |  |  |  |  |
|           | Geometry  |  | Line      | Geographical location of the ASRN edge                                                                         |  |  |  |  |  |  |

Table S1-8. Terrain data

|                     | Area 1                          | Area 2                         | Area 3                            | Area 4                           |
|---------------------|---------------------------------|--------------------------------|-----------------------------------|----------------------------------|
| Post spacing        | 3 arc seconds<br>(approx. 90 m) | 1 arc second<br>(approx. 30 m) | 0.6 arc seconds<br>(approx. 20 m) | 0.3 arc seconds<br>(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 S1-9. Data types

| Type<br>(1) | Description<br>(2)                                                                                                                                                    | Data elements<br>(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<br>Longitude<br>Horizontal reference system<br>Units of measurement<br>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<br>Vertical reference system<br>Units of measurement<br>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<br>Vertical reference system<br>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<br>Vertical reference system<br>Units of measurement<br>Vertical accuracy |
| Distance        | A linear value                                                                                                        | Numerical value<br>Units of measurement<br>Accuracy achieved                              |
| Angle / Bearing | An angular value                                                                                                      | Numerical value<br>Units of measurement<br>Accuracy achieved                              |
| Value           | Any measured, declared or derived value not listed above.                                                             | Numerical Value<br>Units of Measurement<br>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                                                  |

Table S1-10 Information about national and local regulation, services and procedures

|          |                                                                                                                                              |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | <b>National regulations and requirements</b>                                                                                                 |
| 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.                                                    |
|          |                                                                                                                                                           |
| <b>2</b> | <b>Information on services and procedures</b>                                                                                                             |
| 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  | Holding, approach and departure procedures:                                                                                                       |
|        | 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  | ATS surveillance services and procedures for:                                                                                                     |
|        | 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 | Flight planning                                                                                                                                   |

|        |                                                                                                                                                                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | 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 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:                                                                                                                                                                                                                                              |
|       | 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 | 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: |
|        | 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  | Information on aerodrome / heliport operator including:                                                                                                                                                                            |
|        | 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  | Information on low visibility procedures                                                                                                                                                                                   |
|        | 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 the existence of an obstacle free zone / sector                                                                                                                                |
| 2.5.14 | Meteorological information provided at the aerodrome and an indication of which meteorological office is responsible for the service enumerated, including:                                   |
|        | a) name of the associated meteorological office and information on hours of service                                                                                                           |
|        | b) office responsible for preparation of TAFs and periods of validity, interval of issuance of the forecasts, availability of the trend forecasts for the aerodrome, and interval of issuance |
|        | c) information on how briefing and/or consultation is provided                                                                                                                                |
|        | d) types of flight documentation supplied and language(s) used in flight documentation;                                                                                                       |
|        | e) charts and other information displayed or available for briefing or consultation;                                                                                                          |
|        | f) supplementary equipment available for providing information on meteorological conditions, e.g. weather radar and receiver for satellite images;                                            |
|        | g) the air traffic services unit(s) provided with meteorological information; and                                                                                                             |
|        | h) additional information (e.g. concerning any limitation of service, etc.).                                                                                                                  |
| 2.5.15 | Information on hours of operation of AIS briefing office                                                                                                                                      |
| 2.5.16 | Information on hours of operation of ATS reporting office (ARO)                                                                                                                               |
| 2.5.17 | Information on hours of operation of MET briefing office                                                                                                                                      |
| 2.5.18 | Information on hours of operation of air traffic service                                                                                                                                      |
| 2.5.19 | Information on hours of operation of customs and immigration                                                                                                                                  |

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.5.20 | Information on hours of operation of health and sanitation                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2.5.21 | Information on hours of operation of security                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2.6    | Search and Rescue services and procedures                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 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 2. CONTENTS OF THE AERONAUTICAL INFORMATION PUBLICATION (AIP)**

Note 1. — The information elements prefixed with “#AIP-DS#” may be omitted when available through the AIP data set (as specified in Chapter 5, 5.2.1.1.3).

Note 2. — The information elements prefixed with “#OBS-DS#” may be omitted when available through the obstacle data set (as specified in Chapter 5, 5.3.3.2.2).

### **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” shall 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 shall be included in each volume.

#### **GEN 0.1 Preface**

Brief description of the AIP, including:

- 1) name of the publishing authority;
- 2) applicable ICAO documents;
- 3) publication media (i.e. printed, online or other electronic media);
- 4) 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.

*Note.— In the context of meteorological service for international air navigation, both the meteorological authority and the meteorological service provider(s) are to be indicated in the AIP as designated entities, in accordance with RCARS Part 23.*

## **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 agreement, 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 the 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 shall be listed under this subsection. All Annexes shall be listed in numerical order even if there is no difference to an Annex, in which case a NIL notification shall be provided. National differences or the degree of non-application of the regional supplementary procedures (SUPPs) shall 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 the 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 the 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 aeronautical information products**

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) shall be provided.

## **GEN 2.5 List of radio navigation aids**

#AIP-DS# 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 AIS.

#### GEN 3.1.3 Aeronautical publications

Description of the elements of the aeronautical information products, 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 shall 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 held;
- 2) maps and charts held; and
- 3) general area of coverage of such information.

#### GEN 3.1.6 Digital data sets

Description of the available data sets, including:

- 1) data set title;
- 2) short description;
- 3) data subjects included;
- 4) geographical scope; and
- 5) if applicable, limitations related to its usage.
- 6) Contact details of how data sets may be obtained, containing:
  - a) name of the individual, service or organization responsible;

- b) street address and e-mail address of the individual, service or organization responsible;
- c) telefax number of the individual, service or organization responsible;
- d) contact telephone number of the individual, service or organization responsible;
- e) hours of service (time period including time zone when contact can be made);
- f) online information that can be used to contact the individual, service or organization; and
- g) 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 shall 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 (ATS) 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 ATS is provided.

#### GEN 3.3.3 Types of services

Brief description of main types of ATS 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 and navigation 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 service provider 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 and the 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) ATS 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 SAR 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 SAR, including the general conditions under which the service and facilities are available for international use, including an indication of whether a facility available for SAR 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 3.7 Information services

#### GEN 3.7.1 System-wide information management (SWIM) registry(ies)/Information service overview(s)

When SWIM registries are used, the corresponding Uniform Resource Locator (URL) of each registry is provided. Otherwise, a list of the URLs where information service overviews can be found is provided.

*Note.— SWIM registries provide a list of available information services with corresponding information service overviews.*

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

*Note.— 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 shall be included in each

volume. In the case of an AIP being published as one volume, the annotation “not applicable” shall be entered against each of the above subsections.

## **ENR 0.1 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**

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 shall 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;
- 3) changes to the submitted flight plan; and

- 4) if applicable, description of available flight and flow – information for a collaborative environment (FF-ICE) services and associated procedures.

*Note.— Provisions concerning FF-ICE services are contained in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) and the guidance material is contained in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (Doc 9965).*

### **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);
- 3) message address; and
- 4) if applicable, addressing instructions for FF-ICE services.

### **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. ATS 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, and if applicable SATVOICE number, supplemented by indications for specific purposes; and
- 5) remarks.

#AIP-DS# Control zones around military air bases not otherwise described in the AIP shall 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 shall 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.*

*Note 3.— Guidance material on the organization of ATS route publication is contained in the Aeronautical Information Services Manual (Doc 8126).*

### **ENR 3.1 Conventional navigation routes**

#AIP-DS# Detailed description of conventional navigation routes, including:

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

### **ENR 3.2 Area navigation routes**

#AIP-DS# Detailed description of PBN (RNAV and RNP) routes, including:

- 1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) 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) magnetic reference bearing to the nearest degree, 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, SATVOICE number, and any navigation, RCP and RSP 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 shall be indicated in the remarks column. Facility coverage shall be indicated in the remarks column.

#### **ENR 4.2 Special navigation systems**

*#AIP-DS#* 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 shall be indicated in the remarks column. Facility coverage shall 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 shall be indicated in the remarks column. **ENR 4.4 Name-code designators for significant points**

*#AIP-DS#* A list of alphabetically arranged 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 shall 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

*#AIP-DS#* Description, supplemented by charts where appropriate, of other potential hazards that could affect flights (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 or service provider responsible for the provision of information;  
and
- 5) remarks.

#### **ENR 5.4 Air navigation obstacles**

*#OBS-DS#* A 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; and
- 5) type and colour of obstacle lighting (if any).

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

*Note 2.— Specifications concerning 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 Appendix 1.*

#### **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 subsection 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 shall be included in each volume. In the case of an AIP being published as one volume, the annotation “not applicable” shall be entered against each of the above subsections.

### **AD 0.1 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**

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 subsection 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 (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 shall 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;
- 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 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 firefighting;
- 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 (PCR) of aprons;
- 2) designation, width, surface and strength (PCR) 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 shall be provided under this subsection.

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

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

- 1) use of aircraft stand identification signs, taxiway guide lines and visual docking/parking guidance system at aircraft stands;
- 2) runway and taxiway markings and lights;
- 3) stop bars 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); and
  - f) NIL indication, if appropriate.

*Note 1.— Annex 15, Chapter 5 provides a description of Area 2 while Appendix 8, Figure A8-2 of this document contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.*

*Note 2.— Specifications concerning 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 Appendix 1.*

- 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 a digital data set, and a reference to GEN 3.1.6; and
  - g) NIL indication, if appropriate.

*Note 1.— Annex 15, Chapter 5, provides a description of Area 3 while Appendix 8, Figure A8-3 of this document contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.*

*Note 2.— Specifications concerning 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 Appendix 1.*

**\*\*\*\* 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).

**\*\*\*\* 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 (PCR 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) dimensions of runway end safety areas;
- 12) location (which runway end) and description of arresting system (if any);
- 13) the existence of an obstacle-free zone; and
- 14) 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 shall 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 and 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**

*#AIP-DS#* 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 ATS communication facilities established at the aerodrome, including:

- 1) service designation;
- 2) call sign;
- 3) channel(s);
- 4) SATVOICE number(s), if available;
- 5) logon address, as appropriate;
- 6) hours of operation; and
- 7) 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, type of supported operation for ILS/MLS/GLS, basic GNSS and SBAS, classification for ILS, facility classification and approach facility designation(s) for GBAS, and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;
- 2) identification, if required;
- 3) frequency(ies), 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 shall also be given in section ENR 4. If the GBAS serves more than one aerodrome, description of the aid shall 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 shall be indicated in the remarks column. Facility coverage shall 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 Obstacle Chart — ICAO Type B (when available);
- 6) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- 7) Precision Approach Terrain Chart — ICAO (precision approach Cat II and III runways);
- 8) Area Chart — ICAO (departure and transit routes);

- 9) Standard Departure Chart — Instrument — ICAO;
- 10) Area Chart — ICAO (arrival and transit routes);
- 11) Standard Arrival Chart — Instrument — ICAO;  
-41A
- 12) ATC Surveillance Minimum Altitude Chart — ICAO;
- 13) Instrument Approach Chart — ICAO (for each runway and procedure type);
- 14) Visual Approach Chart — ICAO; and
- 15) bird concentrations in the vicinity of the aerodrome.

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

*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 2.25 Visual segment surface (VSS) penetration**

Visual segment surface (VSS) penetration, including procedure and procedure minima affected.

*Note.— Criteria related to the VSS are contained in PANS-OPS Volume II, Part I, Section 4, Chapter 5, paragraph 5.4.6.*

### **AD 3. HELIPORTS**

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

|                                                                                      |
|--------------------------------------------------------------------------------------|
| <p><b>Note.— **** is to be replaced by the relevant ICAO location indicator.</b></p> |
|--------------------------------------------------------------------------------------|

#### **\*\*\*\* 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 shall 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 helicopters;
- 6) repair facilities for visiting helicopters; 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 firefighting;
- 2) rescue equipment;
- 3) capability for removal of disabled helicopters; 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 shall 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); and
- 6) 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 ATS unit(s) provided with meteorological information; and
- 10) additional information (e.g. concerning any limitation of service).

**\*\*\*\* 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 and 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**

#AIP-DS# 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 ATS communication facilities established at the heliport, including:

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

**\*\*\*\* AD 3.18 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 heliport, including:

- 1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS and GBAS, and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;
- 2) identification, if required;
- 3) frequency(ies), 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 heliport purposes, a description shall also be given in section ENR 4. If the GBAS serves more than one heliport, description of the aid shall 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 shall be indicated in the remarks column. Facility coverage shall 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 shall be given in section GEN 3.2.

### Appendix 3. NOTAM FORMAT

(see Chapter 5, 5.2.5)

|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------|---------|---------|-------|-------------|-------------|---------------------|--|--|--|--|--|--|--|---------------|-----|
| Priority indicator                                                                                            |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  | →             |     |
| Address                                                                                                       |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| Date and time of filing                                                                                       |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  | →             |     |
| Originator's indicator                                                                                        |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  | <<≡(          |     |
| <b>Message series, number and identifier</b>                                                                  |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| NOTAM containing new information                                                                              | ..... NOTAMN<br>(series and number/year)                                                         |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| NOTAM replacing a previous NOTAM                                                                              | ..... NOTAMR .....<br>(series and number/year) (series and number/year of NOTAM to be replaced)  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| NOTAM cancelling a previous NOTAM                                                                             | ..... NOTAMC .....<br>(series and number/year) (series and number/year of NOTAM to be cancelled) |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               | <<≡ |
| <b>Qualifiers</b>                                                                                             |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               | FIR                                                                                              | NOTAM Code | Traffic | Purpose | Scope | Lower limit | Upper limit | Coordinates, Radius |  |  |  |  |  |  |  |               |     |
| Q)                                                                                                            |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               | <<≡ |
| Identification of ICAO location indicator in which the facility, airspace or condition reported on is located |                                                                                                  |            |         |         |       |             |             | A)                  |  |  |  |  |  |  |  | →             |     |
| <b>Period of validity</b>                                                                                     |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| From (date-time group)                                                                                        |                                                                                                  |            |         | B)      |       |             |             |                     |  |  |  |  |  |  |  |               | →   |
| To (PERM or date-time group)                                                                                  |                                                                                                  |            |         | C)      |       |             |             |                     |  |  |  |  |  |  |  | EST*<br>PERM* | <<≡ |
| Time schedule (if applicable)                                                                                 |                                                                                                  |            |         | D)      |       |             |             |                     |  |  |  |  |  |  |  | →             |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  | <<≡           |     |
| <b>Text of NOTAM; plain-language entry (using ICAO abbreviations)</b>                                         |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| E)                                                                                                            |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
|                                                                                                               |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |
| Lower limit                                                                                                   |                                                                                                  |            |         | F)      |       |             |             |                     |  |  |  |  |  |  |  | →             |     |
| Upper limit                                                                                                   |                                                                                                  |            |         | G)      |       |             |             |                     |  |  |  |  |  |  |  | ) <<≡         |     |
| Signature                                                                                                     |                                                                                                  |            |         |         |       |             |             |                     |  |  |  |  |  |  |  |               |     |

\*Delete as appropriate

## **INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT**

Note. — For NOTAM examples see the Aeronautical Information Services Manual (Doc 8126) and the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

### **1. General**

The qualifier line (Item Q)) and all identifiers (Items A) to G) inclusive) each followed by a closing parenthesis, as shown in the format, shall be transmitted unless there is no entry to be made against a particular identifier.

### **2. NOTAM numbering**

Each NOTAM shall be allocated a series identified by a letter and a four-digit number followed by a stroke and a twodigit number for the year (e.g. A0023/03). Each series shall start on 1 January with number 0001.

### **3. Qualifiers (Item Q)**

Item Q) is divided into eight fields, each separated by a stroke. An entry shall be made in each field. Examples of how fields are to be filled are shown in the Aeronautical Information Services Manual (Doc 8126). The definition of the fields is as follows:

#### **1) FIR**

- a) If the subject of the information is located geographically within one FIR, the ICAO location indicator shall be that of the FIR concerned. When an aerodrome is situated within the overlying FIR of another State, the first field of Item Q) shall contain the code for that overlying FIR (e.g. Q) LFRR/...A) EGJJ);

or,

if the subject of the information is located geographically within more than one FIR, the FIR field shall be composed of the ICAO nationality letters of the State originating the NOTAM followed by “XX”. (The location indicator of the overlying UIR shall not be used). The ICAO location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or

non-governmental agency which is responsible for provision of a navigation service in more than one State.

- b) If one State issues a NOTAM affecting FIRs in a group of States, the first two letters of the ICAO location indicator of the issuing State plus “XX” shall be included. The location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State.

2) NOTAM CODE

All NOTAM Code groups contain a total of five letters and the first letter is always the letter Q. The second and third letters identify the subject, and the fourth and fifth letters denote the status or condition of the subject reported upon. The two-letter codes for subjects and conditions are those contained in the PANS-ABC (Doc 8400). For combinations of second and third, and fourth and fifth letters, refer to the NOTAM Selection Criteria contained in Doc 8126 or insert one of the following combinations, as appropriate:

- a) If the subject is not listed in the NOTAM Code (PANS-ABC, Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the second and third letters; If subject is “XX”, use “XX” also for condition (e.g. QXXXX).
- b) If the condition of the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the fourth and fifth letters (e.g. QFAXX);
- c) When a NOTAM containing operationally significant information is issued in accordance with Chapter 6.2.1, and when it is used to announce the existence of AIRAC AIP Amendments or Supplements, insert “TT” as the fourth and fifth letters of the NOTAM Code;
- d) When a NOTAM is issued containing a checklist of valid NOTAM, insert “KKKK” as the second, third, fourth and fifth letters; and
- e) The following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:
  - AK = RESUMED NORMAL OPERATION
  - AL = OPERATIVE (OR RE- SUBJECT TO PREVIOUSLY PUBLISHED OPERATIVE) LIMITATIONS/CONDITIONS
  - AO = OPERATIONAL
  - CC = COMPLETED
  - CN = CANCELLED
  - HV = WORK COMPLETED

XX = PLAIN LANGUAGE

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

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

3) TRAFFIC

I = IFR

V = VFR

K = NOTAM is a checklist

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

4) PURPOSE

N = NOTAM selected for the immediate attention of flight crew members

B = NOTAM of operational significance selected for PIB entry

O = NOTAM concerning flight operations

M = Miscellaneous NOTAM; not subject for a briefing, but available on request

K = NOTAM is a checklist

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

5) SCOPE

A = Aerodrome

E = En-route

W = Nav Warning

K = NOTAM is a checklist

If the subject is qualified AE, the aerodrome location indicator shall be reported in Item A).

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

6) and 7) LOWER/UPPER LIMITS

Lower and upper limits shall only be expressed in flight levels (FL) and shall express the actual vertical limits of the area of influence without the addition of buffers. In the case of navigation warnings and airspace restrictions, values entered shall be consistent with those provided under Items F) and G).

If the subject does not contain specific height information, insert “000” for LOWER and “999” for UPPER as default values.

8) COORDINATES, RADIUS

The latitude and longitude accurate to one minute, as well as a three-digit distance figure giving the radius of influence in NM (e.g. 4700N01140E043). Coordinates present approximate centre of circle whose radius encompasses the whole area of influence, and if the NOTAM affects the entire FIR/UIR or more than one FIR/UIR, enter the default value “999” for radius.

#### **4. Item A)**

Insert the ICAO location indicator as contained in Doc 7910 of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one FIR/UIR may be indicated when appropriate. If there is no available ICAO location indicator, use the ICAO nationality letter as given in ICAO Doc 7910, Part 2, plus “XX” and followed up in Item E) by the name, in plain language.

If information concerns GNSS, insert the appropriate ICAO location indicator allocated for a GNSS element or the common location indicator allocated for all elements of GNSS (except GBAS).

Note. — In the case of GNSS, the location indicator may be used when identifying a GNSS element outage (e.g. KNMH for a GPS satellite outage).

#### **5. Item B)**

For date-time group use a ten-figure group, giving year, month, day, hours and minutes in UTC. This entry is the datetime at which the NOTAMN comes into force. In the cases of NOTAMR and NOTAMC, the date-time group is the actual date and time of the NOTAM origination. The start of a day shall be indicated by “0000”.

## **6. Item C)**

With the exception of NOTAMC, a date-time group (a ten-figure group giving year, month, day, hours and minutes in UTC) indicating duration of information shall be used unless the information is of a permanent nature in which case the abbreviation “PERM” is inserted instead. The end of a day shall be indicated by “2359” (i.e. do not use “2400”). If the information on timing is uncertain, the approximate duration shall be indicated using a date-time group followed by the abbreviation “EST”. Any NOTAM which includes an “EST” shall be cancelled or replaced before the date-time specified in Item C).

## **7. Item D)**

If the hazard, status of operation or condition of facilities being reported on will be active in accordance with a specific time and date schedule between the dates-times indicated in Items B) and C), insert such information under Item D). If Item D) exceeds 200 characters, consideration shall be given to providing such information in a separate, consecutive NOTAM.

Note. — Guidance concerning a harmonized definition of Item D) content is provided in Doc 8126.

## **8. Item E)**

Use decoded NOTAM Code, complemented where necessary by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language. When NOTAM is selected for international distribution, English text shall be included for those parts expressed in plain language. This entry shall be clear and concise in order to provide a suitable PIB entry. In the case of NOTAMC, a subject reference and status message shall be included to enable accurate plausibility checks.

## **9. Items F) and G)**

These items are normally applicable to navigation warnings or airspace restrictions and are usually part of the PIB entry. Insert both lower and upper height limits of activities or restrictions, clearly indicating only one reference datum and unit of measurement. The abbreviations GND or SFC shall be used in Item F) to designate ground and surface respectively. The abbreviation UNL shall be used in Item G) to designate unlimited.

# Appendix4. SNOWTAM FORMAT

(See chapter 5, 5.2.5.1.4)

|                       |                           |                          |   |   |  |                      |                         |  |  |  |  |                  |
|-----------------------|---------------------------|--------------------------|---|---|--|----------------------|-------------------------|--|--|--|--|------------------|
| (COM heading)         | (PRIORITY INDICATOR)      | (ADDRESSES)              |   |   |  |                      |                         |  |  |  |  | <E               |
|                       | (DATE AND TIME OF FILING) | (ORIGINATOR'S INDICATOR) |   |   |  |                      |                         |  |  |  |  | <E               |
| (Abbreviated heading) | (SW* SERIAL NUMBER)       |                          |   |   |  | (LOCATION INDICATOR) | DATE/TIME OF ASSESSMENT |  |  |  |  | (OPTIONAL GROUP) |
|                       | S                         | W                        | * | * |  |                      |                         |  |  |  |  |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|
| SNOWTAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (Serial number) | <E       |
| <b>Aeroplane performance calculation section</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |          |
| (AERODROME LOCATION INDICATOR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | M               | A) <E    |
| (DATE/TIME OF ASSESSMENT (Time of completion of assessment in UTC))                                                                                                                                                                                                                                                                                                                                                                                                                                  | M               | B) →     |
| (LOWER RUNWAY DESIGNATION NUMBER)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | M               | C) →     |
| (RUNWAY CONDITION CODE (RWYCC) ON EACH RUNWAY THIRD)<br>(From Runway Condition Assessment Matrix (RCAM) 0, 1, 2, 3, 4, 5 or 6)                                                                                                                                                                                                                                                                                                                                                                       | M               | D) / / → |
| (PER CENT COVERAGE CONTAMINANT FOR EACH RUNWAY THIRD)                                                                                                                                                                                                                                                                                                                                                                                                                                                | C               | E) / / → |
| (DEPTH (mm) OF LOOSE CONTAMINANT FOR EACH RUNWAY THIRD)                                                                                                                                                                                                                                                                                                                                                                                                                                              | C               | F) / / → |
| (CONDITION DESCRIPTION OVER TOTAL RUNWAY LENGTH)<br>(Observed on each runway third, starting from threshold having the lower runway designation number)                                                                                                                                                                                                                                                                                                                                              | M               | G) / /   |
| COMPACTED SNOW<br>DRY<br>DRY SNOW<br>DRY SNOW ON TOP OF COMPACTED SNOW<br>DRY SNOW ON TOP OF ICE<br>FROST<br>ICE<br>SLUSH<br>STANDING WATER<br>WATER ON TOP OF COMPACTED SNOW<br>WET<br>WET ICE<br>WET SNOW<br>WET SNOW ON TOP OF COMPACTED SNOW<br>WET SNOW ON TOP OF ICE                                                                                                                                                                                                                           |                 | →        |
| (WIDTH OF RUNWAY TO WHICH THE RUNWAY CONDITION CODES APPLY, IF LESS THAN PUBLISHED WIDTH)                                                                                                                                                                                                                                                                                                                                                                                                            | O               | H) <E    |
| <b>Situational awareness section</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |          |
| (REDUCED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))                                                                                                                                                                                                                                                                                                                                                                                                                                           | O               | I) →     |
| (DRIFTING SNOW ON THE RUNWAY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | O               | J) →     |
| (LOOSE SAND ON THE RUNWAY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | O               | K) →     |
| (CHEMICAL TREATMENT ON THE RUNWAY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | O               | L) →     |
| (SNOWBANKS ON THE RUNWAY)<br>(If present, distance from runway centre line (m) followed by "L", "R" or "LR" as applicable)                                                                                                                                                                                                                                                                                                                                                                           | O               | M) →     |
| (SNOWBANKS ON A TAXIWAY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O               | N) →     |
| (SNOWBANKS ADJACENT TO THE RUNWAY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | O               | O) →     |
| (TAXIWAY CONDITIONS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | O               | P) →     |
| (APRON CONDITIONS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | O               | R) →     |
| (MEASURED FRICTION COEFFICIENT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | O               | S) →     |
| (PLAIN-LANGUAGE REMARKS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | O               | T) )     |
| NOTES:<br>1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2 or otherwise applicable aerodrome identifier.<br>2. Information on other runways, repeat from B to H.<br>3. Information in the situational awareness section repeated for each runway, taxiway and apron. Repeat as applicable when reported.<br>4. Words in brackets ( ) not to be transmitted.<br>5. For letters A) to T) refer to the Instructions for the completion of the SNOWTAM Format, paragraph 1, item b). |                 |          |
| SIGNATURE OF ORIGINATOR (not for transmission)                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |          |

## INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

*Note.— Origin of data, assessment process and the procedures linked to the surface conditions reporting system are prescribed in the Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes, Doc 9981).*

### 1. General

- a) When reporting on more than one runway, repeat Items B to H (aeroplane performance calculation section).
- b) The letters used to indicate items are only used for reference purpose and should not be included in the messages. The letters, M (mandatory), C (conditional) and O (optional) mark the usage and information and shall be included as explained below.
- c) Metric units shall be used and the unit of measurement not reported.
- d) The maximum validity of SNOWTAM is 8 hours. New SNOWTAM shall be issued whenever a new runway condition report is received.
- e) A SNOWTAM cancels the previous SNOWTAM.
- f) The abbreviated heading “TTAAiiii CCCC MMDDGGgg (BBB)” is included to facilitate the automatic processing of SNOWTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for SNOWTAM = SW;

AA = geographical designator for States, e.g. LF = FRANCE, EG = United Kingdom (see *Location Indicators* (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = SNOWTAM serial number in a four-digit group;

CCCC = four-letter location indicator of the aerodrome to which the SNOWTAM refers (see *Location Indicators* (Doc 7910));

MMDDGGgg = date/time of observation/measurement, whereby:

MM = month, e.g. January = 01, December = 12

DD = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = optional group for correction, in the case of an error, to a SNOWTAM message previously disseminated with the same serial number = COR.

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

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

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

SWLS0149 LSZH 11070620

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

- g) The text “SNOWTAM” in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group shall be separated by a space, for example: SNOWTAM 0124.
- h) For readability purposes for the SNOWTAM message, include a line feed after the SNOWTAM serial number, after Item A, and after the aeroplane performance calculation section.
- i) When reporting on more than one runway, repeat the information in the aeroplane performance calculation section from the date and time of assessment for each runway before the information in the situational awareness section.
- j) Mandatory information is:
  - 1) AERODROME LOCATION INDICATOR;
  - 2) DATE AND TIME OF ASSESSMENT;
  - 3) LOWER RUNWAY DESIGNATOR NUMBER;

- 4) RUNWAY CONDITION CODE FOR EACH RUNWAY THIRD; and
- 5) CONDITION DESCRIPTION FOR EACH RUNWAY THIRD (when runway condition code (RWYCC) is reported 1–5)

## 2. *Aeroplane performance calculation section*

*Item A* — Aerodrome location indicator (four-letter location indicator).

*Item B* — Date and time of assessment (eight-figure date/time group giving time of observation as month, day, hour and minute in UTC).

*Item C* — Lower runway designator number (nn[L] or nn[C] or nn[R]).

*Note.* — *Only one runway designator is inserted for each runway and always the lower number.*

*Item D* — Runway condition code for each runway third. Only one digit (0, 1, 2, 3, 4, 5 or 6) is inserted for each runway third, separated by an oblique stroke (n/n/n).

*Item E* — Per cent coverage for each runway third. When provided, insert 25, 50, 75 or 100 for each runway third, separated by an oblique stroke ([n]nn/[n]nn/[n]nn).

*Note 1.* — *This information is provided only when the runway condition for each runway third (Item D) has been reported as other than 6 and there is a condition description for each runway third (Item G) that has been reported other than DRY.*

*Note 2.* — *When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).*

*Item F* — Depth of loose contaminant for each runway third. When provided, insert in millimeters for each runway third, separated by an oblique stroke (nn/nn/nn or nnn/nnn/nnn).

*Note 1.* — *This information is only provided for the following contamination types:*

— *standing water, values to be reported 04, then assessed value. Significant changes 3 mm up to and including 15 mm;*

— *Slush, values to be reported 03, then assessed value. Significant changes 3 mm up to and including 15 mm;*

— *Wet snow, values to be reported 03, then assessed value. Significant changes 5 mm; and*

— *Dry snow, values to be reported 03, then assessed value. Significant changes 20 mm.*

*Note 2. — When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).*

Item G — Condition description for each runway third. Insert any of the following condition descriptions for each runway third, separated by an oblique stroke.

COMPACTED SNOW

DRY SNOW

DRY SNOW ON TOP OF COMPACTED SNOW

DRY SNOW ON TOP OF ICE

FROST

ICE

SLUSH

STANDING WATER

WATER ON TOP OF COMPACTED SNOW

WET

WET ICE

WET SNOW

WET SNOW ON TOP OF COMPACTED SNOW

WET SNOW ON TOP OF ICE

DRY (only reported when there is no contaminant)

*Note. — When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate runway third(s).*

Item H — Width of runway to which the runway condition codes apply. Insert the width in metres if less than the published runway width.

### 3. Situational awareness section

*Note 1. — Elements in the situational awareness section end with a full stop.*

*Note 2. — Elements in the situational awareness section for which no information exists, or where the conditional circumstances for publication are not fulfilled, are left out completely.*

Item I — Reduced runway length. Insert the applicable runway designator and available length in meters (example: RWY nn [L] or nn [C] or nn [R] REDUCED TO [n]nnn).

*Note. — This information is conditional when a NOTAM has been published with a new set of declared distances.*

Item J — drifting snow on the runway. When reported, insert “DRIFTING SNOW”.

Item K — Loose sand on the runway. When loose sand is reported on the runway, insert the lower runway designator and with a space “LOOSE SAND” (RWY nn or RWY nn[L] or nn[C] or nn[R] LOOSE SAND).

Item L — Chemical treatment on the runway. When chemical treatment has been reported applied, insert the lower runway designator and with a space “CHEMICALLY TREATED” (RWY nn or RWY nn[L] or nn[C] or nn[R] CHEMICALLY TREATED).

Item M — Snow banks on the runway. When snow banks are reported present on the runway, insert the lower runway designator and with a space “SNOW BANK” and with a space left “L” or right “R” or both sides “LR”, followed by the distance in metres from centre line separated by a space FM CL (RWY nn or RWY nn[L] or nn[C] or nn[R] SNOW BANK Lnn or Rnn or LRnn FM CL).

Item N — Snow banks on a taxiway. When snow banks are present on a taxiway, insert the taxiway designator and with a space “SNOW BANK” (TWY [nn]n SNOW BANK).

Item O — Snow banks adjacent to the runway. When snow banks are reported present penetrating the height profile in the aerodrome snow plan, insert the lower runway designator and “ADJ SNOW BANKS” (RWY nn or RWY nn[L] or nn[C] or nn[R] ADJ SNOW BANKS).

Item P — Taxiway conditions. When taxiway conditions are reported as poor, insert the taxiway designator followed by a space “POOR” (TWY [n or nn] POOR *or* ALL TWYS POOR).

Item R — Apron conditions. When apron conditions are reported as poor, insert the apron designator followed by a space “POOR” (APRON [nnnn] POOR *or* ALL APRONS POOR).

Item S — Measured friction coefficient. Where reported, insert the measured friction coefficient and friction measuring device.

*Note. — This will only be reported for States that have an established programme of runway friction measurement using a State-approved friction measuring device.*

Item T — plain language remarks.

## EXAMPLE OF COMPLETED SNOWTAM FORMAT

### Example SNOWTAM 1

GG EADBZQZX EADNZQZX EADSZQZX  
170100 EADDYNYX  
SWEA0149 EADD 02170055  
(SNOWTAM 0149  
EADD  
02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW  
)

### Example SNOWTAM 2

GG EADBZQZX EADNZQZX EADSZQZX  
170140 EADDYNYX  
SWEA0150 EADD 02170135  
(SNOWTAM 0150  
EADD  
02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW  
02170135 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH  
)

Example SNOWTAM 3

GG EADBZQZX EADNZQZX EADSZQZX  
170229 EADDYNYX  
SWEA0151 EADD 02170225  
(SNOWTAM 0151  
EADD  
02170055 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/WET SNOW  
02170135 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH  
02170225 09C 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW

RWY 09L SNOW BANK R20 FM CL. RWY 09R ADJ SNOW BANKS. TWY B POOR.  
APRON NORTH POOR)

Example SNOWTAM 4

GG EADBZQZX EADNZQZX EADSZQZX  
170350 EADDYNYX  
SWEA0152 EADD 02170345  
(SNOWTAM 0152  
EADD  
02170345 09L 5/5/5 100/100/100 NR/NR/03 WET/WET/SLUSH  
02170134 09R 5/2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH  
02170225 09C 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW 35

DRIFTING SNOW. RWY 09L LOOSE SAND. RWY 09R CHEMICALLY TREATED. RWY  
09C CHEMICALLY TREATED.)

## Appendix5. ASHTAM FORMAT

(See Chapter 5, 5.17.6)

|                       |                                  |                                       |    |    |  |  |                             |  |  |                       |  |  |  |  |                  |  |  |
|-----------------------|----------------------------------|---------------------------------------|----|----|--|--|-----------------------------|--|--|-----------------------|--|--|--|--|------------------|--|--|
| (COM heading)         | (PRIORITY INDICATOR)             | (ADDRESSEE INDICATOR(S)) <sup>1</sup> |    |    |  |  |                             |  |  |                       |  |  |  |  |                  |  |  |
|                       | (DATE AND TIME ( OF FILING))     |                                       |    |    |  |  | (ORIGINATOR'S ( INDICATOR)) |  |  |                       |  |  |  |  |                  |  |  |
| (Abbreviated heading) | (VA* <sup>2</sup> SERIAL NUMBER) |                                       |    |    |  |  | (LOCATION INDICATOR)        |  |  | DATE/TIME OF ISSUANCE |  |  |  |  | (OPTIONAL GROUP) |  |  |
|                       | V                                | A                                     | *2 | *2 |  |  |                             |  |  |                       |  |  |  |  |                  |  |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| ASHTAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (SERIAL NUMBER) |
| (FLIGHT INFORMATION REGION AFFECTED)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A)              |
| (DATE/TIME (UTC) OF ERUPTION)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | B)              |
| (VOLCANO NAME AND NUMBER)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | C)              |
| (VOLCANO LATITUDE/LONGITUDE OR VOLCANO RADIAL AND DISTANCE FROM NAVAID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D)              |
| (VOLCANO LEVEL OF ALERT COLOUR CODE, INCLUDING ANY PRIOR LEVEL OF ALERT COLOUR CODE) <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                        | E)              |
| (EXISTENCE AND HORIZONTAL/VERTICAL EXTENT OF VOLCANIC ASH CLOUD) <sup>4</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | F)              |
| (DIRECTION OF MOVEMENT OF ASH CLOUD) <sup>4</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | G)              |
| (AIR ROUTES OR PORTIONS OF AIR ROUTES AND FLIGHT LEVELS AFFECTED)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H)              |
| (CLOSURE OF AIRSPACE AND/OR AIR ROUTES OR PORTIONS OF AIR ROUTES, AND ALTERNATIVE AIR ROUTES AVAILABLE)                                                                                                                                                                                                                                                                                                                                                                                                                                  | I)              |
| (SOURCE OF INFORMATION)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | J)              |
| (PLAIN-LANGUAGE REMARKS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | K)              |
| <p>NOTES:</p> <ol style="list-style-type: none"> <li>1. See also Appendix 5 regarding addressee indicators used in predetermined distribution systems.</li> <li>2. *Enter ICAO nationality letter as given in ICAO Doc 7910, Part 2.</li> <li>3. See paragraph 3.5 below.</li> <li>4. Advice on the existence, extent and movement of volcanic ash cloud G) and H) may be obtained from the volcanic ash advisory centre(s) responsible for the FIR concerned.</li> <li>5. Item titles in brackets ( ) not to be transmitted.</li> </ol> |                 |

SIGNATURE OF ORIGINATOR (not for transmission)

## INSTRUCTIONS FOR THE COMPLETION OF THE ASHTAM FORMAT

### 1. General

1.1 The ASHTAM provides information on the status of activity of a volcano when a change in its activity is, or is expected to be, of operational significance. This information is provided using the volcano level of alert colour code given in 3.5 below.

1.2 In the event of a volcanic eruption producing ash cloud of operational significance, the ASHTAM also provides information on the location, extent and movement of the ash cloud and the air routes and flight levels affected.

1.3 Issuance of an ASHTAM giving information on a volcanic eruption, in accordance with paragraph 3 below, should not be delayed until complete information A) to K) is available but should be issued immediately following receipt of notification that an eruption has occurred or is expected to occur, or a change in the status of activity of a volcano of operational significance has occurred or is expected to occur, or an ash cloud is reported. In the case of an expected eruption, and hence no ash cloud evident at that time, items A) to E) should be completed and items F) to I) indicated as “not applicable”. Similarly, if a volcanic ash cloud is reported, e.g. by special air-report, but the source volcano is not known at that time, the ASHTAM should be issued initially with items A) to E) indicated as “unknown”, and items F) to K) completed, as necessary, based on the special air-report, pending receipt of further information. In other circumstances, if information for a specific field A) to K) is not available, indicate “NIL”.

1.4 The maximum period of validity of ASHTAM is 24 hours. New ASHTAM shall be issued whenever there is a change in the level of alert.

### 2. Abbreviated heading

2.1 Following the usual aeronautical fixed telecommunication network (AFTN) communications header, the abbreviated heading “TT AAiiii CCCC MMYYGggg (BBB)” is included to facilitate the automatic processing of ASHTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for ASHTAM = VA;

AA = geographical designator for States, e.g. NZ = New Zealand (see Location Indicators (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = ASHTAM serial number in a four-figure group;

CCCC = four-letter location indicator of the flight information region concerned (see Location Indicators (Doc 7910), Part 5, addresses of centres in charge of FIR/UIR);

MMYYGGgg = date/time of report, whereby:

MM = month, e.g. January = 01, December = 12

YY = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = Optional group for correction to an ASHTAM message previously disseminated with the same serial number = COR.

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

Example: Abbreviated heading of ASHTAM for Auckland Oceanic FIR, report on 7 November at 0620 UTC: VANZ0001 NZZO 11070620

### 3. Content of ASHTAM

3.1 Item A — Flight information region affected, plain-language equivalent of the location indicator given in the abbreviated heading, in this example “Auckland Oceanic FIR”.

3.2 Item B — Date and time (UTC) of first eruption.

3.3 Item C — Name of volcano, and number of volcano as listed in the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Appendix E, and on the World Map of Volcanoes and Principal Aeronautical Features.

3.4 Item D — Latitude/Longitude of the volcano in whole degrees or radial and distance of volcano from NAVAID as listed in Doc 9691, Appendix E, and on the World Map of Volcanoes and Principal Aeronautical Features).

3.5 Item E — Colour code for level of alert indicating volcanic activity, including any previous level of alert colour code as follows:

| Level of alert colour code | Status of activity of volcano                                                                                                                                                                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GREEN ALERT                | Volcano is in normal, non-eruptive state.<br><br>or, after a change from a higher alert level:<br><br>Volcanic activity considered to have ceased, and volcano reverted to its normal, non-eruptive state.                                                     |
| YELLOW ALERT               | Volcano is experiencing signs of elevated unrest above known background levels.<br><br>or, after a change from a higher alert level:<br><br>Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. |
| ORANGE ALERT               | Volcano is exhibiting heightened unrest with increased likelihood of eruption.<br><br>or,<br><br>Volcanic eruption is underway with no or minor ash emission [specify ash-plume height if possible].                                                           |
| RED ALERT                  | Eruption is forecast to be imminent with significant emission of ash into the atmosphere likely.<br>or,<br>Eruption is underway with significant emission of ash into the atmosphere [specify ash-plume height if possible].                                   |

Note.— The colour code for the level of alert indicating the status of activity of the volcano and any change from a previous status of activity should be provided to the area control centre by the responsible vulcanological agency in the State concerned, e.g. “RED ALERT FOLLOWING YELLOW” OR “GREEN ALERT FOLLOWING ORANGE”.

3.6 Item F — If volcanic ash cloud of operational significance is reported, indicate the horizontal extent and base/top of the ash cloud using latitude/longitude (in whole degrees) and altitudes in thousands of metres (feet) and/or radial and distance from source volcano. Information initially

may be based only on special air-report, but subsequent information may be more detailed based on advice from the responsible meteorological watch office and/or volcanic ash advisory centre.

3.7 Item G — Indicate forecast direction of movement of the ash cloud at selected levels based on advice from the responsible meteorological watch office and/or volcanic ash advisory centre.

3.8 Item H — Indicate air routes and portions of air routes and flight levels affected, or expected to become affected.

3.9 Item I — Indicate closure of airspace, air routes or portions of air routes, and availability of alternative routes.

3.10 Item J — The source of the information (e.g. “special air-report” or “vulcanological agency.”) should always be indicated, whether an eruption has actually occurred or ash cloud reported, or not.

3.11 Item K — Include in plain language any operationally significant information additional to the foregoing.

## **Appendix6. TERRAIN AND OBSTACLE ATTRIBUTES PROVISION REQUIREMENTS**

**Table A6-1. 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 A6-2. Obstacle attributes**

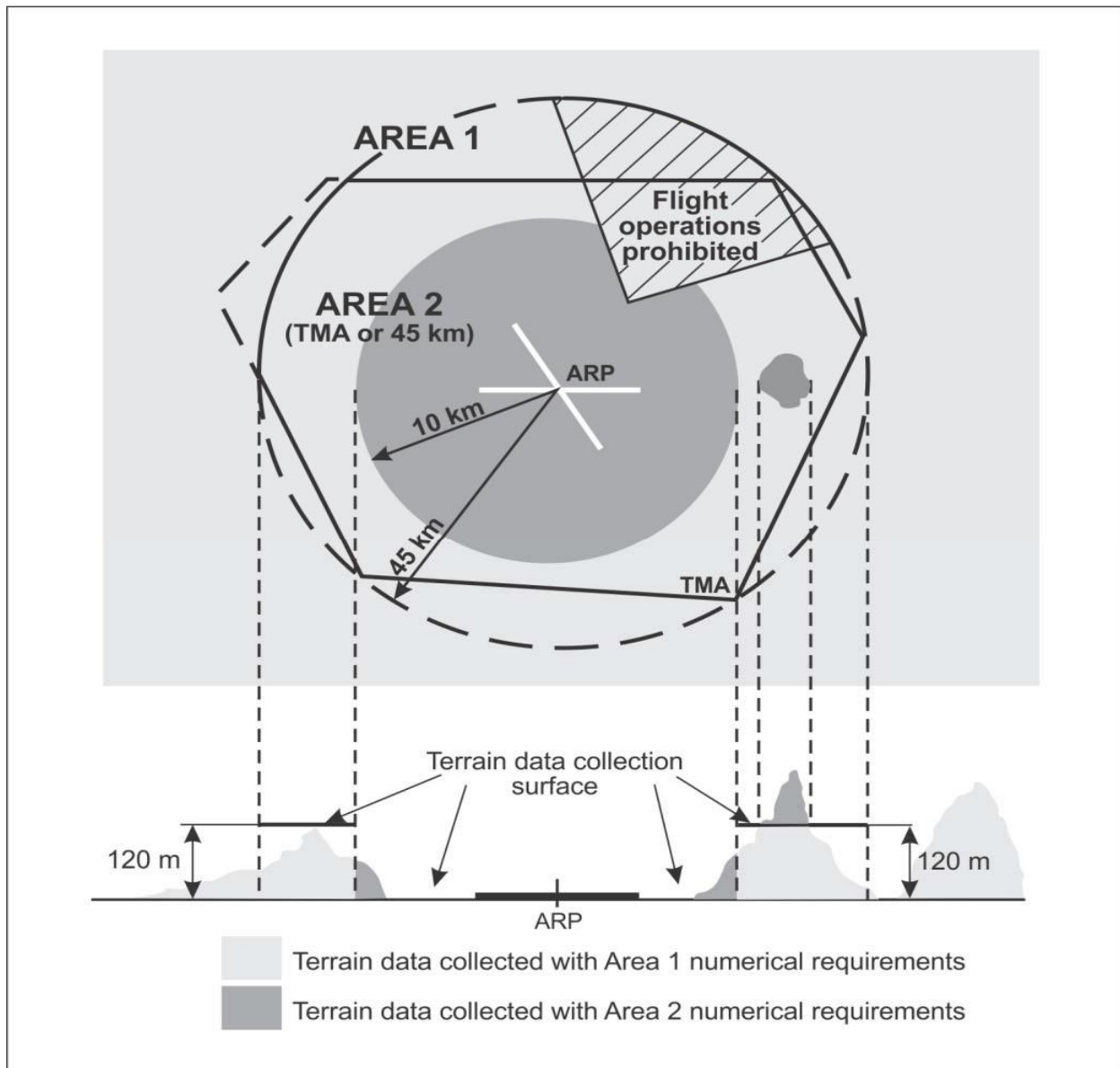
| Obstacle attribute          | Mandatory/Optional |
|-----------------------------|--------------------|
| Area of coverage            | Mandatory          |
| Data originator identifier  | Mandatory          |
| Data source identifier      | Mandatory          |
| Obstacle identifier         | Mandatory          |
| 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          |

## **Appendix7. PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM**

(See Chapter 5, 5.4.2.4, and Annex 10, Volume II, Chapter 4, 4.4.14)

1. The predetermined distribution system provides for incoming NOTAM (including ASHTAM) to be channelled through the aeronautical fixed service (AFS) direct to designated addressees predetermined by the receiving State concerned while concurrently being routed to the international NOTAM office for checking and control purposes.
2. The addressee indicators for those designated addressees are constituted as follows:
  - i. First and second letters:  
The first two letters of the location indicator for the AFS communication centre associated with the relevant international NOTAM office of the receiving State.
  - ii. Third and fourth letters:  
The letters “ZZ” indicating a requirement for special distribution.
  - iii. Fifth letter:  
The fifth letter differentiating between NOTAM (letter “N”), SNOWTAM (letter “S”), and ASHTAM (letter “V”).
  - iv. Sixth and seventh letters:  
The sixth and seventh letters, each taken from the series A to Z and denoting the national and/or international distribution list(s) to be used by the receiving AFS centre.  
  
Note. — The fifth, sixth and seventh letters replace the three-letter designator YNY which, in the normal distribution system, denotes an international NOTAM office.
  - v. Eighth letter:  
The eighth position letter shall be the filler letter “X” to complete the eight-letter addressee indicator.
3. States are to inform the States from which they receive NOTAM of the sixth and seventh letters to be used under different circumstances to ensure proper routing.

## Appendix8. TERRAIN AND OBSTACLE DATA REQUIREMENTS (See Chapter 5)



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

1. Within the area covered by a 10-km radius from the aerodrome reference point (ARP), terrain data shall comply with the Area 2 numerical requirements.

2. In the area between 10 km and the terminal control area (TMA) boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 2 numerical requirements.
3. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that does not penetrate the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 1 numerical requirements.
4. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data shall comply with the Area 1 numerical requirements.

Note. — Terrain data numerical requirements for Areas 1 and 2 are specified in Appendix 1.

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

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in Appendix 1.
2. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data shall be collected and recorded in accordance with the Area 1 requirements.
3. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher shall be collected and recorded in the database in accordance with the Area 1 numerical requirements specified in Appendix 1.

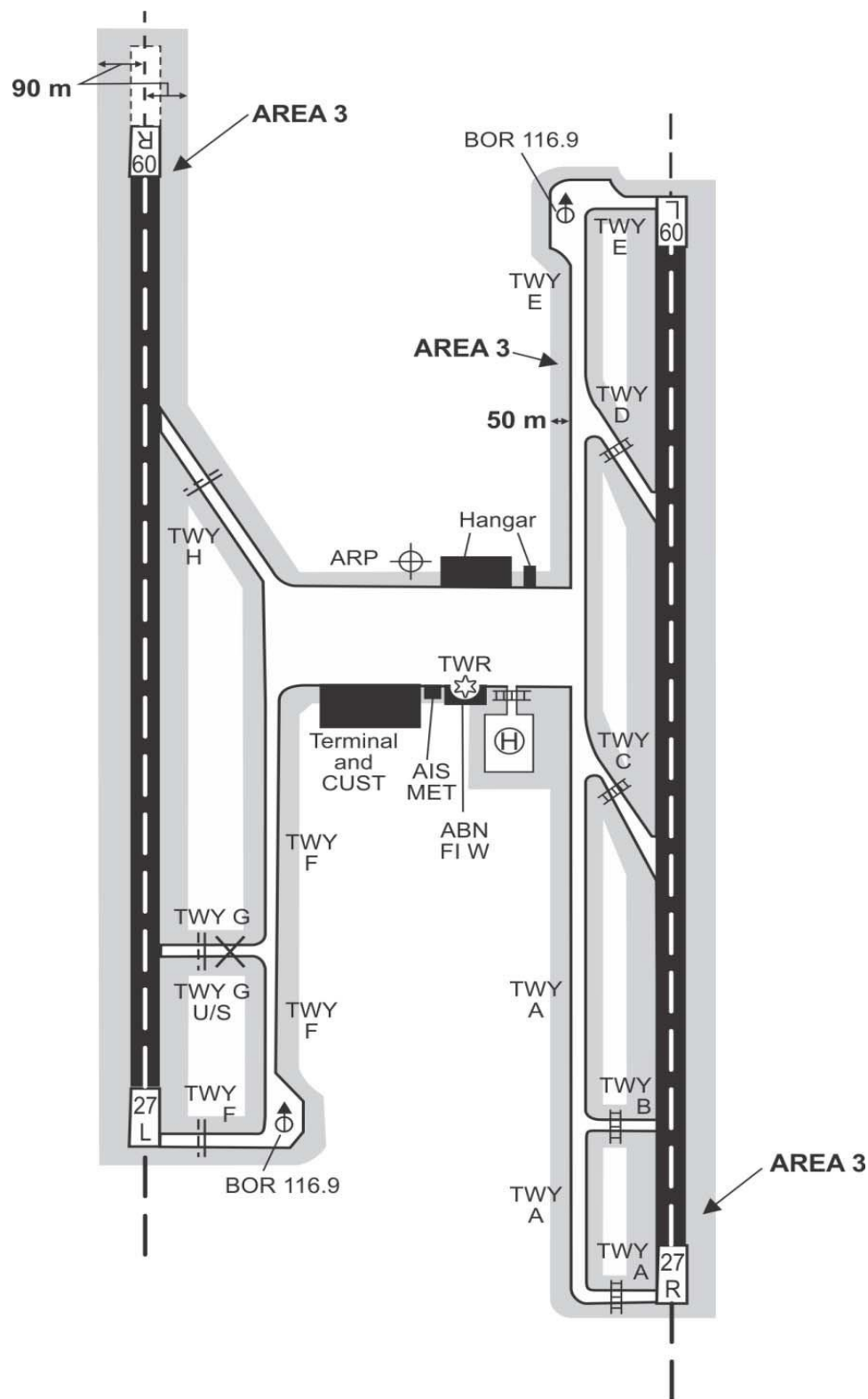
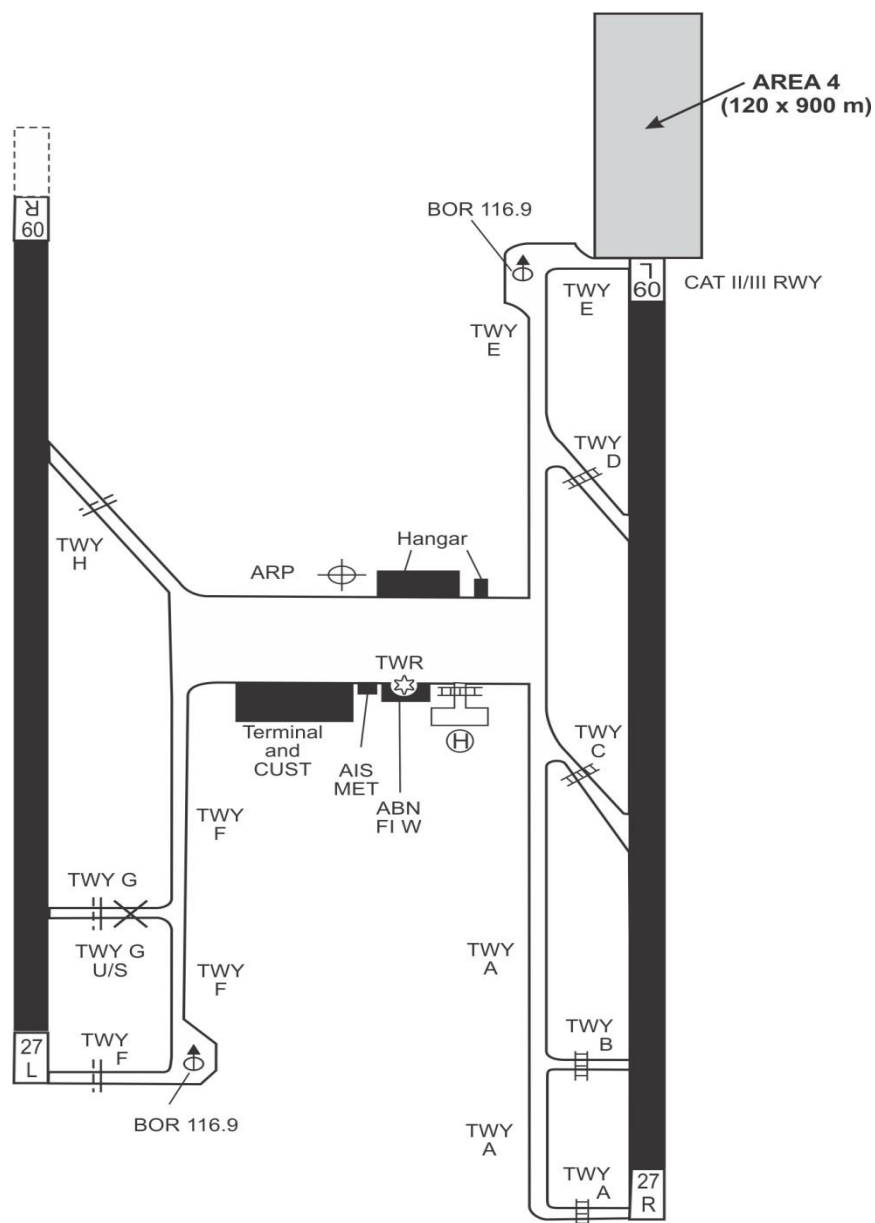


Figure A8-3. Terrain and obstacle data collection surface — Area 3

Terrain and obstacle data in Area 3 shall comply with the numerical requirements specified in Appendix 1.



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

Terrain and obstacle data in Area 4 shall comply with the numerical requirements specified in Appendix 1.

## **Appendix9. COORDINATED UNIVERSAL TIME**

1. Coordinated Universal Time (UTC) has now replaced Greenwich Mean Time (GMT) as the accepted international standard for clock time. It is the basis for civil time in many States and is also the time used in the worldwide time signal broadcasts used in aviation. The use of UTC is recommended by such bodies as the General Conference on Weights and Measures (CGPM), the International Radio Consultative Committee (CCIR) and the World Administration Radio Conference (WARC).

2. The basis for all clock time is the time of apparent rotation of the sun. This is, however, a variable quantity which depends, among other things, on where it is measured on earth. A mean value of this time, based upon measurements in a number of places on the earth, is known as Universal Time. A different time scale, based upon the definition of the second, is known as International Atomic Time (TAI). A combination of these two scales results in Coordinated Universal Time. This consists of TAI adjusted as necessary by the use of leap seconds to obtain a close approximation (always within 0.5 seconds) of Universal Time.