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**Air Navigation Order (ANO)  
For  
Aeronautical Information Services**

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**ANO (AIS) A.1**

**First Edition – February, 2009**

**CIVIL AVIATION AUTHORITY  
BANGLADESH**

**Amendments**

Amendments and Corrigenda to these “ANO (AIS) A.1 FOR AERONAUTICAL INFORMATION SERVICES BANGLADESH” is issued by Chairman CAAB. The space below is provided to keep a record of such amendments.

**Record of amendments and corrigenda**

AMENDMENT			
No.	DATE APPLICABLE	DATE ENTERED	ENTERED BY

CORRIGENDA			
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## **TERMS OF REFERENCE**

### **1. Word meanings**

- 1.1 "shall" means a procedure is mandatory.
- 1.2 "should" means a procedure is recommended
- 1.3 "may" means a procedure is optional
- 1.4 "will" means futurity, not a requirement for the application of a procedure.
- 1.5 "Bangladesh" means The People's Republic of Bangladesh.

### **2. Amendment Procedure**

- 2.1 The change number and effective date are printed on each revised (replacement) or additional page.

## FOREWORD

Article 28 (Air navigation facilities and standard systems) of the Convention on International Civil Aviation requires each contracting State to provide, in its territory, airports, radio services, meteorological services and other air navigation services to facilitate international air navigation, in accordance with the standards and recommended practices established from time to time, pursuant to this Convention. Under Article 37 (Adoption of international Standards and Procedures) of the Convention, each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation. To this end the International Civil Aviation Organization adopts and amends from time to time, as may be necessary, international standards and recommended practices and procedures dealing with Aeronautical Information Services practices.

In above respect, ICAO Annex 15 provides the Standards pertaining to the Aeronautical Information Services which are required to be adopted by the Bangladesh (CAAB).

This Air Navigation Order for Aeronautical Information Services "ANO (AIS) A.1" has been enacted by Civil Aviation Authority of Bangladesh under Rule 4 & Rule 273 of CAR-84 to give effect to the Standard and Recommended Practices of Annex-15 "Aeronautical Information Services" to the Convention of International Civil Aviation for safety, regularity and efficiency of Civil Aviation Authority of Bangladesh.

.....  
(Chairman)  
Civil Aviation Authority, Bangladesh.

## CHAPTER 1 INTRODUCTION

The object of the aeronautical information service is to ensure the flow of information/data necessary for the safety, regularity and efficiency of international air navigation. The role

importance of aeronautical information/data changed significantly with the implementation of area navigation (RNAV), based navigation required navigation performance (RNP), airborne computer based navigation system and data link system. Corrupt or erroneous aeronautical information/data can potentially affect the safety of air navigation.

To satisfy the uniformity and consistency in the provision of aeronautical information/data that is required for the operational use by computer-based navigation system, Bangladesh shall ensure use of International Standards and procedures.

Guidance material shall also be issued on the organization and the operation of Aeronautical Information Services in conformity with ICAO AIS Manual (Doc 8126).

## CHAPTER 2. DEFINITIONS

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

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

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

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

**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 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 information/data 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 published by means of special pages.

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

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

**AIS product.** Aeronautical information provided in the form of the elements of the Integrated Aeronautical Information Package (except NOTAM and PIB), including aeronautical charts, or in the form of suitable electronic media.

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

**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 ADSC reports would be initiated, and what data would be contained in the reports. Note.— *The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.*

**Automatic terminal information service (ATIS).** The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof: *Data link-automatic terminal information service (D ATIS).* The provision of ATIS via data link. *Voice-automatic terminal information service (Voice-ATIS).* The provision of ATIS by means of continuous and repetitive voice broadcasts.

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



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

**Canopy.** Bare Earth supplemented by vegetation height.

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

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

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

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

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

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

**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 meets the requirements of the data user in terms of accuracy, resolution and integrity.

**Data set.** Identifiable collection of data (ISO 19101\*). Data set series. Collection of data sets sharing the same product specification (ISO 19115\*).

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

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

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

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

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

**Feature.** Abstraction of real world phenomena (ISO 19101\*). Feature attribute. Characteristic of a feature (ISO 19101\*).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Heliport.** An aerodrome or a defined area on a structure intended to be used

wholly or in part for the arrival, departure and surface movement of helicopters.

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

**Integrated Aeronautical Information Package.** A package which consists of the following elements:

- AIP, including amendment service;
- Supplements to the AIP;
- NOTAM and PIB;
- AIC; and
- checklists and lists of valid NOTAM.

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

**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.— Data that describes and documents data.

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

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

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

**NOTAM.** A notice to airmen 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 are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.

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

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

**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 fulfill quality requirements will be fulfilled (ISO 9000\*).

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

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

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

**Requirements.** Need or expression 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.*

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

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

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

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

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

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

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

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

*Note.— When considering product, traceability can relate to:*  
— *the origin of materials and parts;*  
— *the processing history; and*  
— *the distribution and location of the product after delivery.*

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

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

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

*Note 2.— Confirmation can comprise activities such as:*

- performing alternative calculations;*
- comparing a new design specification with a similar proven design specification;*
- undertaking tests and demonstrations; and*
- reviewing documents prior to issue.*

**VOLMET.** Meteorological information for aircraft in flight. *Data link-VOLMET (D-VOLMET).* Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link. *VOLMET broadcast.* Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

## **CHAPTER 3. GENERAL**

### **3.1 Responsibilities and functions**

3.1.1 Civil Aviation Authority of Bangladesh (CAAB) shall provide Aeronautical information service.

3.1.1.1 Bangladesh shall remain responsible for the information published.

3.1.1.2 It shall be ensured that aeronautical information/data relates to the entire territory of Bangladesh, as well as areas in which Bangladesh is responsible for air traffic services outside its territory, is adequate and of required quality and timely. All services associated with aircraft operations shall timely provide the required information/data to aeronautical information service.

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

3.1.2 CAAB shall, in addition, obtain information to enable it to provide pre-flight information service and to meet the need for in-flight information.

- a) from the aeronautical information services of other States;
- b) from other sources that may be available.

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

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

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

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

3.1.6 CAAB shall ensure that aeronautical information/data necessary for the safety, regularity or efficiency of air navigation is made available in a form suitable for the operational requirements of:

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

3.1.7 CAAB shall receive and/or originate, collate or assemble, edit, format, publish/store and distribute aeronautical information/data concerning the entire territory of Bangladesh and for airspace over high seas delegated to Bangladesh for provision of air traffic services. Aeronautical information shall be published as an Integrated Aeronautical Information Package.

### **3.2 Quality system**

3.2.1 CAAB shall take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage as outlined in 3.1.7 above. The execution of such quality management shall be made demonstrable for each function stage, when required.

3.2.2 The quality system established in accordance with

3.2.1 should be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and certified by an approved organization

3.2.3 Within the context of a quality system, the skills and knowledge required for each function shall be identified and personnel assigned to perform those functions shall be appropriately trained. It shall be ensured that the personnel possess the skills and competencies required to perform specific assigned functions, and appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required skills and competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

3.2.4 It shall be ensured that established procedures exist in order that aeronautical data at any moment is traceable to its origin so as to allow any data anomalies or errors, detected during the production/maintenance phases or in operational use, to be corrected.

3.2.5 The established quality system shall provide users with the necessary assurance and confidence that distributed aeronautical information/data satisfy stated requirements for data quality (accuracy, resolution and integrity) and for data traceability by the use of appropriate procedures in every stage of data production or data modification process. The system shall also provide assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.

3.2.6 The order of accuracy for aeronautical data, based upon a 95 per cent confidence level, shall be as specified in ANO (ATS) A.1 Chapter 2, and ANO (AD) A.1 and ANO (AD) A.2 Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical

calculations from the known surveyed points of points in space/fixes) and declared points (flight information region boundary points).

3.2.7 It shall be ensured that the order of publication resolution of aeronautical data shall be that as specified in Appendices 1 and 7.

3.2.8 It shall be ensured that the integrity of aeronautical data is maintained throughout the data process from survey/origin to distribution to the next intended user. Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply:

- a) critical data, integrity level  $1 \times 10^{-8}$ : there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) essential data, integrity level  $1 \times 10^{-5}$ : there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) routine data, integrity level  $1 \times 10^{-3}$ : there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

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

3.2.10 Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the cyclic redundancy check (CRC). To achieve protection of the integrity level of critical and essential aeronautical data as classified in 3.2.8, a 32- or 24-bit CRC algorithm shall apply respectively.

3.2.11 To achieve protection of the integrity level of routine aeronautical data as classified in 3.2.8, a 16-bit CRC algorithm should apply.

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

3.2.13 Demonstration of compliance of the quality system applied shall be by audit. If nonconformity is identified, initiating action to correct its cause shall be determined and taken. All audit observations and remedial actions shall be evidenced and properly documented.

### **3.3 Exchange of aeronautical information/data**



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

3.3.2 Where more than one international NOTAM office have been designated, the extent of responsibility and the territory covered by each office shall be defined.

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

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

3.3.5 One copy of each of the elements of the Integrated Aeronautical Information Package, in paper or electronic form or both, that have been requested by the aeronautical information service of an ICAO Contracting State shall be made available by CAAB in the mutually-agreed form(s), without charge.

3.3.6 Intentionally left blank

3.3.7 Intentionally left blank

#### **3.4 Copyright**

If any product of AIS has been granted copyright protection and is provided to another State in accordance with 3.3, it shall only be made available to a third party on the condition that the third party is made aware that the product is copyright protected and provided that it is appropriately annotated that the product is subject to copyright.

3.5 Intentionally left blank

#### **3.6 General specifications**

3.6.1 Each element of the Integrated Aeronautical Information Package for distribution shall be in English.

3.6.2 Intentionally left blank.

3.6.3 Units of measurement used in the distribution of aeronautical information/data should be consistent with the tables contained in Part V CAR 84 Units of Measurement to be Used in Air and Ground Operations.

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

3.6.5 Use of automation

Automation in AIS should be introduced with the objective of improving the speed, accuracy, efficiency and cost-effectiveness of aeronautical information services.

3.6.6 Identification and delineation of prohibited, restricted and danger areas

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

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

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

- a) nationality letters for location indicators assigned to Bangladesh ;
- b) a letter P for prohibited area, R for restricted area and D for danger area as appropriate;
- c) a number, unduplicated within Bangladesh.

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

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

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

### 3.6.7 Human Factors considerations

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

## 3.7 Common reference systems for air navigation

### 3.7.1 Horizontal reference system

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

3.7.1.2 In precise geodetic applications and some air navigation applications, temporal changes in the tectonic plate motion and tidal effects on the Earth's crust should be modeled and estimated. To reflect the temporal effect, an epoch should be included with any set of absolute station coordinates.

3.7.1.3 Geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in ANO (ATS) A.1 Chapter 2, and ANO (AD) A.1 and ANO (AD) A.2 Chapter 2, shall be identified by an asterisk.

3.7.1.4 The order of publication resolution of geographical coordinates shall be that specified in Appendix 1 and Table A7-1 of Appendix 7 while the order of chart resolution of geographical coordinates shall be that specified in ANO (Aeronautical Charts) A.1

### 3.7.2 Vertical reference system

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

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

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

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

3.7.2.3 At those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation specified in ANO (AD) A.1 and ANO (AD) A.2 on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used. When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, shall be provided in the Aeronautical Information Publication (AIP).

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

3.7.2.5 The order of publication resolution of elevation and geoid undulation shall be that specified in Appendix 1 and Table A7-2 of Appendix 7 while the order of chart resolution of elevation and geoid undulation shall be that specified in ANO (Aeronautical Charts) A.1

### 3.7.3 Temporal reference system

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

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

## **CHAPTER 4. AERONAUTICAL INFORMATION PUBLICATIONS (AIP)**

Note 1.— AIP are intended primarily to satisfy international requirements for the exchange of aeronautical information of a lasting character essential to air navigation. When practicable, the form of presentation is designed to facilitate their use in flight.

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

## 4.1 Contents

4.1.1 An Aeronautical Information Publication shall contain, in three parts, sections and subsections uniformly referenced to allow for standardized electronic data storage and retrieval, current information relating to, and arranged under, those subjects enumerated in Appendix 1 that appear in Roman type. To facilitate operational use in flight, the format and the arrangement of the AIP, or volume of the AIP may be redesigned provided an adequate table of contents is included.

4.1.1.1 Aeronautical Information Publications should, in addition, contain current information relating to those subjects enumerated in Appendix 1 that appear in italic type.

4.1.2 Aeronautical Information Publications shall include in Part 1 — General (GEN):

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

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

- a) Aerodrome/Heliport Chart — ICAO;
- b) Aerodrome Ground Movement Chart — ICAO;
- c) Aerodrome Obstacle Chart — ICAO Type A;
- d) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- e) Aircraft Parking/Docking Chart — ICAO;
- f) Area Chart — ICAO;
- g) ATC Surveillance Minimum Altitude Chart — ICAO;
- h) Instrument Approach Chart — ICAO;
- i) Precision Approach Terrain Chart — ICAO;
- j) Standard Arrival Chart — Instrument (STAR) — ICAO;
- k) Standard Departure Chart — Instrument (SID) — ICAO;
- l) Visual Approach Chart — ICAO.

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

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

## 4.2 General specifications

4.2.1 Each Aeronautical Information Publication 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).

4.2.1.1 Each AIP shall not duplicate information within itself or from other sources.

4.2.1.2 Intentionally left blank.

4.2.2 AIP shall be published in loose-leaf form.

4.2.3 Each page of Aeronautical Information Publication shall be dated. The date, consisting of the day, month (by name) and year, shall be the publication date or the effective date of the information.

4.2.4 A checklist giving the current date of each page in the Aeronautical Information Publication series shall be reissued frequently to assist the user in maintaining a current publication. The page number/chart title and date of the checklist shall appear on the checklist itself.

4.2.5 Each Aeronautical Information Publication issued in loose-leaf form shall be so annotated as to indicate clearly:

- a) the identity of the Aeronautical Information Publication;
- b) the territory covered and subdivisions when necessary;
- c) the identification of the issuing State i.e. Bangladesh and producing organization (CAAB);
- d) page numbers/chart titles;
- e) the degree of reliability if the information is doubtful.

4.2.6 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.

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

4.2.8 Operationally significant changes to the AIP shall be published in accordance with AIRAC procedures and shall be clearly identified by the acronym — AIRAC.

4.2.9 AIP shall be amended or reissued at such regular intervals as may be necessary to keep them up to date. Recourse to hand amendments or annotations shall be kept to the minimum. The normal method of amendment shall be by means of replacement sheets.

4.2.9.1 The regular interval referred to in 4.2.9 shall be specified in the AIP, Part 1— General (GEN).

### **4.3 Specifications for AIP Amendments**

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

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

4.3.3 Each AIP Amendment page, including the cover sheet, shall display a publication date.

4.3.4 Each AIRAC AIP Amendment page, including the cover sheet, shall display an effective date.

4.3.5 When an AIP Amendment is issued, it shall include references to the serial number of those elements, if any, of the Integrated Aeronautical Information Package which have been incorporated into the amendment.

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

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

#### **4.4 Specifications for AIP Supplements**

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

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

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

4.4.4 When an AIP Supplement is sent in replacement of a NOTAM, it shall include a reference to the serial number of the NOTAM.

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

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

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

#### **4.5 Distribution**

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

## **CHAPTER 5. NOTAM**

### **5.1 Origination**

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

Note — Operationally significant changes concerning circumstances listed in Appendix 4, Part 1, are issued under the Aeronautical Information Regulation and Control (AIRAC) system specified in Chapter 6.

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

- a) establishment, closure or significant changes in operation of aerodrome(s)/heliport(s) or runways;
- b) establishment, withdrawal and significant changes in operation of aeronautical services (AGA, AIS, ATS, COM, MET, SAR, etc.);
- c) establishment or withdrawal of electronic and other aids to air navigation and aerodromes/heliports. This includes: interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any electronic aid to air navigation, and air-ground communication services;
- d) establishment, withdrawal or significant changes made to visual aids;
- e) interruption of or return to operation of major components of aerodrome lighting systems;
- f) establishment, withdrawal or significant changes made to procedures for air navigation services;
- g) occurrence or correction of major defects or impediments in the manoeuvring area;
- h) changes to and limitations on availability of fuel, oil and oxygen;
- i) major changes to search and rescue facilities and services available;
- j) establishment, withdrawal or return to operation of hazard beacons marking obstacles to air navigation;
- k) changes in regulations requiring immediate action, e.g. prohibited areas for SAR action;
- l) presence of hazards which affect air navigation (including obstacles, military exercises, displays, races and major parachuting events outside promulgated sites);
- m) erecting or removal of, or changes to, obstacles to air navigation in the takeoff/climb, missed approach, approach areas and runway strip;
- n) establishment or discontinuance (including activation or deactivation) as applicable, or changes in the status of prohibited, restricted or danger areas;

- o) establishment or discontinuance of areas or routes or portions thereof where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;
- p) allocation, cancellation or change of location indicators;
- q) significant changes in the level of protection normally available at an aerodrome for rescue and firefighting purposes. NOTAM shall be originated only when a change of category is involved and such change of category shall be clearly stated;
- r) presence or removal of, or significant changes in, hazardous conditions due to snow, slush, ice or water on the movement area;
- s) outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;
- t) forecasts of solar cosmic radiation, where provided;
- u) an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions and/or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;
- v) release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions thereof which could be affected and the direction of movement;
- w) establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of United Nations, together with procedures and/or limitations which affect air navigation; and
- x) implementation of short-term contingency measures in cases of disruption, or partial disruption, of air traffic services and related supporting services.

5.1.1.2 The need for origination of a NOTAM should be considered in any other circumstance which may affect the operations of aircraft.

5.1.1.3 The following information shall not be notified by NOTAM:

- a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- c) temporary obstructions in the vicinity of aerodromes/ heliports that do not affect the safe operation of aircraft;
- d) partial failure of aerodrome/heliport lighting facilities where such failure does not directly affect aircraft operations;
- e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative;
- f) the lack of apron marshalling services and road traffic control;
- g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;
- h) parachuting when in uncontrolled airspace under VFR, when controlled, at promulgated sites or within danger or prohibited areas;
- i) other information of a similar temporary nature.

5.1.1.4 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.



5.1.1.4.1 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.

5.1.1.5 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.

5.1.1.6 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, NOTAM shall be originated giving a brief description of the contents, the effective date and the reference number to the amendment or supplement. This NOTAM shall come into force on the same effective date as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.

## **5.2 General specifications**

5.2.1 Except as otherwise provided in 5.2.3 and 5.2.4, each NOTAM shall contain the information in the order shown in the NOTAM Format in Appendix 6.

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

5.2.2.1 When NOTAM is selected for international distribution, English text shall be included for those parts expressed in plain language.

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

5.2.3 Information concerning snow, slush, ice and standing water on aerodrome/heliport pavements shall, when reported by means of a SNOWTAM, contain the information in the order shown in the SNOWTAM Format in Appendix 2.

5.2.4 Information concerning an operationally significant change in volcanic activity, a volcanic eruption and/or volcanic ash cloud shall, when reported by means of an ASHTAM, contain the information in the order shown in the ASHTAM Format in Appendix 3.

5.2.5 The NOTAM originator 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.

Note.— Letters A to Z, with the exception of S and T, may be used to identify a NOTAM series.

5.2.6 When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued.

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

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

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

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

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

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

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

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

5.2.12.2 Where no ICAO location indicator is assigned to the location, its place name spelt in accordance with 3.6.2 shall be entered in plain language.

5.2.13 A checklist of valid NOTAM shall be issued as a NOTAM over the Aeronautical Fixed Service (AFS) at intervals of not more than one month using the NOTAM Format specified in Appendix 6. One NOTAM shall be issued for each series.

5.2.13.1 A checklist of NOTAM shall refer to the latest AIP Amendments, AIP Supplements and at least the internationally distributed AIC.

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

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

### **5.3 Distribution**

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

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

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

5.3.2.2 When a NOTAM exchanged as specified in 5.3.4 is sent by means other than the AFS, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator shall be used, preceding the text.

5.3.3 The originator shall select the NOTAM that are to be given international distribution.

5.3.3.1 Selective distribution lists should be used when practicable.

5.3.4 International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices concerned. The international exchange of ASHTAM, and NOTAM is used for distribution of information on volcanic activity it shall include volcanic ash advisory centres and the centres designated by regional air navigation agreement for the operation of AFS satellite distribution systems (satellite distribution system for information relating to air navigation (SADIS) and international satellite communications system (ISCS)), and shall take account of the requirements of long-range operations.

Note.— Arrangements may be made for direct exchange of SNOWTAM (see Appendix 2) between aerodromes/heliports.

5.3.4.1 These exchanges of NOTAM between international NOTAM offices shall, as far as practicable, be limited to the requirements of the receiving States concerned by means of separate series providing for at least international and domestic flights.

5.3.4.2 A predetermined distribution system for NOTAM transmitted on the AFS in accordance with Appendix 5 shall be used whenever possible, subject to the requirements of 5.3.4.

## **CHAPTR 6. AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)**

### **6.1 General specifications**

6.1.1 Information concerning the circumstances listed in Appendix 4, Part 1, shall be distributed under the regulated system (AIRAC), i.e. basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of 28 days, including 29 January 1998. The information notified therein shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

6.1.2 The regulated system (AIRAC) should also be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the circumstances listed in Appendix 4, Part 2.

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

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

6.1.5 The use of the date in the AIRAC cycle which occurs between 21 December and 17 January inclusive should be avoided as an effective date for the introduction of significant changes under the AIRAC system.

## **6.2 Provision of information in paper copy form**

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

6.2.2 Whenever major changes are planned and where advance notice is desirable and practicable, information published in paper copy form should be distributed by the AIS unit at least 56 days in advance of the effective date.

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

## **6.3 Provision of information in electronic form**

6.3.1 Where an aeronautical database has been established in electronic form while updating its contents concerning the circumstances listed in Appendix 4, Part 1, it shall be ensured that the effective dates of data coincide with the established AIRAC effective dates used for the provision of information in paper copy form.

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

6.3.3 It is recommended that whenever major changes are planned and where advance notice is desirable and practicable, information provided in electronic form should be distributed/made available at least 56 days in advance of the effective date.

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

# **CHAPTER 7. AERONAUTICAL INFORMATION CIRCULARS (AIC)**

## **7.1 Origination**

7.1.1 An AIC shall be originated whenever it is necessary to promulgate aeronautical information which does not qualify:

- a) for inclusion in an AIP; or
- b) for the origination of a NOTAM.

7.1.1.1 An AIC shall be originated whenever it is desirable to promulgate:

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

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

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

7.1.1.2 The snow plan published under AD 1.2.2 of Appendix 1 shall be supplemented by seasonal information, to be issued well in advance of the beginning of each winter — not less than one month before the normal onset of winter conditions— and shall contain information such as that listed below:

- a) a list of aerodromes/heliports where snow clearance is expected to be performed during the coming winter:
  - \*1) in accordance with the runway and taxiway systems; or
  - \*2) planned snow clearing, deviating from the runway system (length, width and number of runways, affected taxiways and aprons or portions thereof);

\* This information, or any part of it, may be included in the AIP.
- \*b) information concerning any centre designated to coordinate information on the current state of progress of clearance and on the current state of runways, taxiways and aprons;
- c) a division of the aerodromes/heliports into SNOWTAM distribution lists in order to avoid excessive NOTAM distribution;
- \*d) an indication, as necessary, of minor changes to the standing snow plan;
- \*e) a descriptive list of clearance equipment;
- \*f) a listing of what will be considered as the minimum critical snow bank to be reported at each aerodrome/ heliport at which reporting will commence.

*\* This information, or any part of it, may be included in the AIP, if so desired.*

## 7.2 General specifications

7.2.1 AIC shall be issued in printed form.

Note.— Both text and diagrams may be included.

7.2.1.1 Originator (CAAB) shall select the AIC that are to be given international distribution.

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

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

7.2.1.4 Intentionally left blank.

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

## 7.3 Distribution

AIC selected for international distribution shall be the same as for the AIP.

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

### 8.1 Pre-flight information

8.1.1 At any aerodrome/heliport normally used for international air operations, aeronautical information essential for the safety, regularity and efficiency of air navigation and relative to the route stages originating at the aerodrome/heliport shall be made available to flight operations personnel, including flight crews and services responsible for pre-flight information.

8.1.2 Aeronautical information provided for pre-flight planning purposes at the aerodromes/heliports referred to in 8.1.1 shall include relevant:

- a) elements of the Integrated Aeronautical Information Package;
- b) maps and charts.

Note.— The documentation listed in a) and b) may be limited to national publications and when practicable, those of immediately adjacent States, provided a complete library of aeronautical information is available at a central location and means of direct communications are available between the aerodrome AIS unit and that library.

8.1.2.1 Additional current information relating to the aerodrome of departure shall be provided concerning the following:

- a) construction or maintenance work on or immediately adjacent to the manoeuvring area;
- b) rough portions of any part of the manoeuvring area, whether marked or not, e.g. broken parts of the surface of runways and taxiways;
- c) presence and depth of snow, ice or water on runways and taxiways, including

- their effect on surface friction;
- d) snow drifted or piled on or adjacent to runways or taxiways;
- e) parked aircraft or other objects on or immediately adjacent to taxiways;
- f) procedures and/or limitations applied thereof.

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

## **8.2 Automated aeronautical information systems**

8.2.1 Where automated pre-flight information systems is used to make aeronautical information/data available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes, the information/data made available shall comply with the provisions of 8.1.2 and 8.1.3.

8.2.2 Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with 8.2.1 and meteorological information in accordance with 9.5.1 of ICAO Annex 3 — Meteorological Service for Air Navigation, should be established by an agreement between the AIS service provider and the meteorological authority.

8.2.3 Where automated pre-flight information systems are used to provide the harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information/ data and meteorological information, the AIS service provider shall remain responsible for the quality and timeliness of the aeronautical information/ data provided by means of such a system.

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

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

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

- a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical information 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 information/data accessed, as required;
- d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate, or based on a menu driven user

interface or other appropriate mechanism as agreed between the AIS service provider and operator concerned; and  
e) provide for rapid response to a user request for information.

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

### **8.3 Post-flight information**

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

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

## **CHAPTER 9. TELECOMMUNICATION REQUIREMENTS**

9.1 NOTAM offices shall be connected to the aeronautical fixed service (AFS).

9.1.1 The connections shall provide for printed communications.

9.2 Each NOTAM office shall be connected, through the aeronautical fixed service (AFS), to the following points within the territory for which it provides service:

- a) area control centres and flight information centres;
- b) aerodromes/heliports at which an information service is established in accordance with Para 8.

## **CHAPTER 10. ELECTRONIC TERRAIN AND OBSTACLE DATA**

### **10.1 Function**

Sets of electronic terrain and obstacle data used in combination with aeronautical data, as appropriate, shall satisfy user requirements necessary to support 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);
- g) aeronautical chart production and on-board databases;
- h) flight simulator;
- i) synthetic vision; and
- j) aerodrome/heliport obstacle restriction and removal.



## 10.2 Coverage and terrain and obstacle data numerical requirements

10.2.1 To satisfy requirements necessary to accommodate air navigation systems or functions specified in 10.1, sets of electronic terrain and obstacle data shall be collected and recorded in databases in accordance with the following coverage areas:

- Area 1: entire territory of Bangladesh;
- Area 2: terminal control area;
- Area 3: aerodrome/heliport area; and
- Area 4: Category II or III operations area.

Note.— See Appendix 8 for graphical illustrations of the defined coverage areas.

10.2.2 Area 1 shall cover the entire territory of Bangladesh, including aerodromes/heliports. Area 2 shall be the terminal control area as published in aeronautical information publication (AIP-India) or limited to a 45-km radius from the aerodrome/ heliport reference point (whichever is smaller). At IFR aerodromes/heliports where a terminal control area has not been established, Area 2 shall be the area within a 45-km radius of the aerodrome/heliport reference point.

10.2.3 At IFR aerodromes/heliports, Area 3 shall cover the area that extends from the edge(s) of the runway(s) to 90 m from the runway centre line(s) and for all other parts of aerodrome/ heliport movement area(s), 50 m from the edge(s) of the defined area(s).

10.2.4 Area 4 shall be restricted to those runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess, by use of radio altimeters, the effect of terrain on decision height determination. The width of the area shall be 60 m on either side of the extended runway centre line while the length shall be 900 m from the runway threshold measured along the extended runway centre line.

10.2.5 According to the air navigation applications listed in 10.1 and areas of coverage, sets of electronic terrain data shall satisfy the numerical requirements specified in Appendix 8, Table A8-1 while obstacle data shall satisfy the numerical requirements specified in Appendix 8, Table A8-2.

## 10.3 Terrain database — content and structure

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

10.3.2 Sets of electronic terrain data shall include spatial (position and elevation), thematic and temporal aspects for the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles. In practical terms, depending on the acquisition method used, this

shall represent the continuous surface that exists at the bare Earth, the top of the canopy or something in between, also known as “first reflective surface”.

10.3.3 Terrain data shall be collected according to the areas specified in 10.2, terrain data collection surfaces and criteria specified in Appendix 8, Figure A8-1, and in accordance with the terrain data numerical requirements provided in Table A8-1 of Appendix 8. In terrain databases, only one feature type, i.e. terrain, shall be recorded. Feature attributes describing terrain shall be those listed in Appendix 8, Table A8-3. The terrain feature attributes listed in Table A8-3 represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain database.

#### **10.4 Obstacle database — content and structure**

10.4.1 One obstacle database shall contain a digital set of obstacle data and shall include those features having vertical significance in relation to adjacent and surrounding features that are considered hazardous to air navigation. Obstacle data shall comprise the digital representation of the vertical and horizontal extent of man-made objects. Obstacles shall not be included in terrain databases. Obstacle data elements are features that shall be represented in the database by points, lines or polygons.

10.4.2 Obstacles, which in accordance with the definition, can be fixed (permanent or temporary) or mobile shall be identified within the areas defined in 10.2, on the basis of the obstacle data collection surfaces and criteria specified in Appendix 8, Figure A8-2, and collected in accordance with obstacle data numerical requirements provided in Table A8-2 of Appendix 8. In an obstacle database, all defined obstacle feature types shall be recorded and each of them shall be described according to the list of mandatory attributes provided in Table A8-4 of Appendix 8.

#### **10.5 Terrain and obstacle data product specifications**

10.5.1 To allow and support the interchange and use of sets of electronic terrain and obstacle data among different data providers and data users, the ISO 19100 series of standards for geographic information shall be used as a general data modeling framework.

10.5.2 A comprehensive statement of available electronic terrain and obstacle data sets shall be provided in the form of terrain data product specifications as well as obstacle data product specifications on which basis air navigation users will be able to evaluate the products and determine whether they fulfill the requirements for their intended use (application).

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

10.5.3 Each terrain data product specification shall include an overview, a 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.

10.5.4 The overview of terrain data product specification or obstacle data product specification shall provide an informal description of the product and shall contain general information about the data product. Specification of terrain data may not be homogenous

across the whole data product but may vary for different parts of the data sets. For each such subset of data, a specification scope shall be identified. Identification information concerning both terrain and obstacle data products shall include the title of the product; a brief narrative summary of the content, purpose, and spatial resolution if appropriate (a general statement about the density of spatial data); the geographic area covered by the data product; and supplemental information.

10.5.5 Content information of feature-based terrain data sets or of feature-based obstacle data sets shall each be described in terms of an application schema and a feature catalogue. Application schema shall provide a formal description of the data structure and content of data sets while the feature catalogue shall provide the semantics of all feature types together with their attributes and attribute value domains, association types between feature types and feature operations, inheritance relations and constraints. Coverage is considered a subtype of a feature and can be derived from a collection of features that have common attributes. Both terrain and obstacle data product specifications shall identify clearly the coverage and/or imagery they include and shall provide a narrative description of each of them.

Note 1. — ISO Standard 19109 contains rules for application schema while ISO Standard 19110 describes feature cataloguing methodology for geographic information.

Note 2.— ISO Standard 19123 contains schema for coverage geometry and functions.

10.5.6 Both terrain data product specifications and obstacle data product specifications shall include information that identifies the reference system used in the data product. This shall include the spatial reference system and temporal reference system. Additionally, both data product specifications shall identify the data quality requirements for each data product. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures. This statement shall cover all the data quality elements and data quality sub-elements, even if only to state that a specific data quality element or sub-element is not applicable.

Note.— ISO Standard 19113 contains quality principles for geographic information while ISO Standard 19114 covers quality evaluation procedures.

10.5.7 Terrain data product specifications shall include a data capture statement, which shall be a general description of the sources and of processes applied for the capture of terrain data. The principles and criteria applied in the maintenance of terrain data sets and obstacle data sets shall also be provided with the data specifications, including the frequency with which data products are updated. Of particular importance shall be the maintenance information of obstacle data sets and an indication of the principles, methods and criteria applied for obstacle data maintenance.

10.5.8 Terrain data product specifications shall contain information on how data held with data sets is presented, i.e. as a graphic output, as a plot or as an image. The product specifications for both terrain and obstacles shall also contain data product delivery information, which shall include delivery formats, and delivery medium information.

Note.— ISO Standard 19117 contains a definition of the schema describing the portrayal of geographic information including the methodology for describing symbols and mapping of the schema to an application schema.

10.5.9 The core terrain and obstacle metadata elements shall be included in the data product specifications. Any additional metadata items required to be supplied shall be stated in each product specification together with the format and encoding of the metadata.

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

## **10.6 Availability**

10.6.1 It shall be ensured that electronic terrain and obstacle data related to their entire territory are made available in the manner specified in 10.2, 10.3 and 10.4 for use by civil aviation.

10.6.1.1 It shall be ensured that electronic terrain and obstacle data are made available in accordance with Area 1 specifications and terrain data in accordance with Area 4 specifications.

10.6.1.2 It shall be ensured that as of 18 November 2010, electronic terrain and obstacle data are made available in accordance with Area 2 and Area 3 specifications.

10.6.1.3 Electronic terrain and obstacle data should be made available in accordance with Area 1, Area 2 and Area 3 specifications and terrain data in accordance with Area 4 specifications.

10.6.2 Intentionally left blank.

**APPENDIX 1. CONTENTS OF AERONAUTICAL INFORMATION PUBLICATION (AIP)****PART 1 — GENERAL (GEN)**

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

**GEN 0.1 Preface**

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

- 1) name of the publishing authority;
- 2) applicable ICAO documents;
- 3) the AIP structure and established regular amendment interval; and
- 4) 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) telex number; and
- 7) aeronautical fixed service (AFS) address.

#### 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 nonimmigrant 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), signaling devices and life-saving equipment as presented in Annex 6, Part I, 6.6 and Part II, 6.4 where so determined by regional air navigation meetings, for flights over designated land areas.

#### GEN 1.6 Summary of national regulations and international agreements/conventions

A list of titles and references and, where applicable, summaries of national regulations affecting air navigation, together with a list of international agreements/conventions ratified by State.

#### GEN 1.7 Differences from ICAO Standards, Recommended Practices and Procedures

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

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

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

## GEN 2. TABLES AND CODES

### GEN 2.1 Measuring system, aircraft markings, holidays

#### GEN 2.1.1 Units of measurement

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

#### GEN 2.1.2 Temporal reference system

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

#### GEN 2.1.3 Horizontal reference system

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

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

#### GEN 2.1.4 Vertical reference system

Brief description of the vertical reference system used, including:

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

#### GEN 2.1.5 Aircraft nationality and registration marks

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

#### GEN 2.1.6 Public holidays

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

### GEN 2.2 Abbreviations used in AIS publications

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

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

### GEN 2.3 Chart symbols

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

#### GEN 2.4 Location indicators

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

#### GEN 2.5 List of radio navigation aids

A list of radio navigation aids arranged alphabetically, containing:

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

#### GEN 2.6 Conversion tables

Tables for conversion 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 conversion tables, as appropriate.

#### GEN 2.7 Sunrise/sunset tables

Brief description of criteria used for determination of the times given in the sunrise/sunset tables, together with an alphabetical list of locations for which the times are given 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) telex number;
- 6) AFS address;
- 7) 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
- 8) an indication if service is not H24.

##### GEN 3.1.2 Area of responsibility



The area of responsibility for the aeronautical information service.

#### GEN 3.1.3 Aeronautical publications

Description of the elements of the Integrated Aeronautical Information Package, including:

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

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

#### GEN 3.1.4 AIRAC system

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

#### GEN 3.1.5 Pre-flight information service at aerodromes/heliports

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

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

#### GEN 3.1.6 Electronic terrain and obstacle data

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

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

### GEN 3.2 Aeronautical charts

#### GEN 3.2.1 Responsible service(s)

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

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) telex number;
- 6) AFS address;
- 7) 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
- 8) 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) telex number; and
- 6) AFS address.

#### GEN 3.2.4 Aeronautical chart series available

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

#### GEN 3.2.5 List of aeronautical charts available

A list of aeronautical charts available, including:

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

GEN 3.2.6 Index to the World Aeronautical Chart (WAC) — ICAO 1:1 000 000 An index chart showing coverage and sheet layout for the WAC 1:1 000 000 produced by a State. If Aeronautical Chart — ICAO 1:500 000 is produced instead of WAC 1:1 000 000, index charts must be used to indicate coverage and sheet layout for the Aeronautical Chart — ICAO 1:500 000.

#### GEN 3.2.7 Topographical charts

Details of how topographical charts may be obtained, containing:

- 1) name of service/agency(ies);
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) telex number; and
- 6) AFS address.

GEN 3.2.8 Corrections to charts not contained in the AIP A list of corrections to aeronautical charts not contained in the AIP, or an indication where such information can be obtained.

### GEN 3.3 Air traffic services

#### GEN 3.3.1 Responsible service:

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

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;

- 5) telex number;
- 6) AFS address;
- 7) 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
- 8) an indication if service is not H24.

#### GEN 3.3.2 Area of responsibility

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

#### GEN 3.3.3 Types of services

Brief description of main types of air traffic services provided.

GEN 3.3.4 Coordination between the operator and ATS General conditions under which coordination between the operator and air traffic services is effected.

#### GEN 3.3.5 Minimum flight altitude

The criteria used to determine minimum flight altitudes.

#### GEN 3.3.6 ATS units address list

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

- 1) unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) telex number; and
- 6) AFS address.

### GEN 3.4 Communication services

#### GEN 3.4.1 Responsible service

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

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) telex number;
- 6) AFS address;
- 7) 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
- 8) 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 3.5 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) telex number;
- 6) AFS address;
- 7) 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
- 8) an indication if service is not H24.

##### GEN 3.5.2 Area of responsibility

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

##### GEN 3.5.3 Meteorological observations and reports

Detailed description of the meteorological observations and reports provided for international air navigation, including:

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

##### GEN 3.5.4 Types of services

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

##### GEN 3.5.5 Notification required from operators

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

##### GEN 3.5.6 Aircraft reports

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

#### GEN 3.5.7 VOLMET service

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

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

#### GEN 3.5.8 SIGMET and AIRMET service

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

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

#### GEN 3.5.9 Other automated meteorological services

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

- 1) service name;
- 2) information available;
- 3) areas, routes and aerodromes covered; and
- 4) telephone, telex and telefax number(s).

### 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) telex number;
- 6) AFS address; and
- 7) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

**GEN 3.6.2 Area of responsibility**

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

**GEN 3.6.3 Types of service**

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

**GEN 3.6.4 SAR agreements**

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

**GEN 3.6.5 Conditions of availability**

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

**GEN 3.6.6 Procedures and signals used**

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

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

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

**GEN 4.1 Aerodrome/heliport charges**

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

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

**GEN 4.2 Air navigation services charges**

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

- 1) approach control;
- 2) route air navigation services;
- 3) cost basis for air navigation services and exemptions/ reductions; and

4) methods of payment.

## **PART 2 — EN-ROUTE (ENR)**

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments must be included in each volume. In the case of an AIP being published as one volume, the annotation “not applicable” must be entered against each of the above subsections. Reference must be made in the appropriate subsection to indicate that differences between national regulations and ICAO SARPs and procedures exist and that they are detailed in GEN 1.7. ENR 0.6 Table of contents to Part 2 A list of sections and subsections contained in Part 2 — En-route.

Note.— Subsections may be listed alphabetically.

### **ENR 1. GENERAL RULES AND PROCEDURES**

#### **ENR 1.1 General rules**

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

#### **ENR 1.2 Visual flight rules**

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

#### **ENR 1.3 Instrument flight rules**

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

#### **ENR 1.4 ATS airspace classification**

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

#### **ENR 1.5 Holding, approach and departure procedures**

##### **ENR 1.5.1 General**

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

##### **ENR 1.5.2 Arriving flights**

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

##### **ENR 1.5.3 Departing flights**

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

## ENR 1.6 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 1.7 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, with properly annotated national differences, if any.

## ENR 1.9 Air traffic flow management

Brief description of air traffic flow management (ATFM) system, 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.

#### ENR 1.10 Flight planning

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

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

#### ENR 1.11 Addressing of flight plan messages

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

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

#### ENR 1.12 Interception of civil aircraft

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

#### 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.

## ENR 2. AIR TRAFFIC SERVICES AIRSPACE

### ENR 2.1 FIR, UIR, TMA

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

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

Control zones around military air bases not otherwise described in the AIP must be included in this subsection. Where the requirements of Annex 2 concerning flight plans, two-way communications and position reporting apply to all flights in order to eliminate or

reduce the need for interceptions and/or where the possibility of interception exists and the maintenance of guard on the VHF emergency channel 121.5 MHz is required, a statement to this effect must be included for the relevant area(s) or portion(s) thereof. A description of designated areas over which the carriage of an emergency locator transmitter (ELT) is required and where aircraft shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

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

#### ENR 2.2 Other regulated airspace

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

### ENR 3. ATS ROUTES

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

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

#### ENR 3.1 Lower ATS routes

Detailed description of lower ATS routes, including:

- 1) route designator, required navigation performance (RNP) type(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.

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

#### ENR 3.2 Upper ATS routes

Detailed description of upper ATS routes, including:

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

- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits and airspace classification;
- 4) lateral limits;
- 5) direction of cruising levels; and
- 6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address.

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

#### ENR 3.3 Area navigation routes

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

- 1) route designator, required navigation performance (RNP) type(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 a VOR/DME area navigation route, additionally:
  - a) station identification of the reference VOR/DME;
  - b) bearing to the nearest degree and the distance to the nearest tenth of a kilometre or tenth of a nautical mile from the reference VOR/DME, if the waypoint is not collocated with it; and
  - c) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft);
- 3) geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between defined end-points and distance between each successive designated significant point;
- 4) upper and lower limits and airspace classification;
- 5) direction of cruising levels; and
- 6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address.

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

#### ENR 3.4 Helicopter routes

Detailed description of helicopter routes, including:

- 1) route designator, required navigation performance (RNP) type(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits and airspace classification;
- 4) minimum flight altitudes to the nearest higher 50 m or 100 ft; and
- 5) remarks, including an indication of the controlling unit and its operating frequency.

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

#### ENR 3.5 Other routes

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

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

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

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

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

#### ENR 4.2 Special navigation systems

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

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

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

**ENR 4.3 Global navigation satellite system (GNSS)**

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

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

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

**ENR 4.4 Name-code designators for significant points** An alphabetically arranged list of name-code designators (five-letter pronounceable “name-code”) established for significant points at positions not marked by the site of radio navigation aids, including:

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

**ENR 4.5 Aeronautical ground lights — en-route**

A list of aeronautical ground lights and other light beacons designating geographical positions which are selected by CAAB 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**

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.

shall remain valid in the pre-flight information bulletin for a period of fourteen days.

- 2) upper and lower limits; and
- 3) remarks, including time of activity.

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

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

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 Description, supplemented by charts where appropriate, of activities that could affect flights including:

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

#### ENR 5.3.2 Other potential hazards

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

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

#### ENR 5.4 Air navigation obstacles

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

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

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

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

ENR 5.5 Aerial sporting and recreational activities Brief description, supplemented by graphic portrayal where appropriate, of intensive aerial sporting and recreational activities together with conditions under which they are carried out, including:

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

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

#### ENR 5.6 Bird migration and areas with sensitive fauna

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

#### ENR 6. EN-ROUTE CHARTS

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

### **PART 3 — AERODROMES (AD)**

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

#### AD 0.6 Table of contents to Part 3

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

Note.— Subsections may be listed alphabetically.

#### AD 1. AERODROMES/HELIPORTS — INTRODUCTION

##### AD 1.1 Aerodrome/heliport availability

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;
- 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;
- 3) regulations, if any, concerning civil use of military air bases;
- 4) the general conditions under which the low visibility procedures applicable to Cat II/III operations at aerodromes, if any, are applied;
- 5) friction measuring device used and the runway friction level below which the State will declare the runway to be slippery when wet; and
- 6) other information of a similar nature.

##### AD 1.2 Rescue and firefighting services and snow plan

###### AD 1.2.1 Rescue and firefighting services

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

###### AD 1.2.2 Snow plan

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

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

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

#### AD 1.3 Index to aerodromes and heliports

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

- 1) aerodrome/heliport name and ICAO location indicator;
- 2) type of traffic permitted to use the aerodrome/heliport (international/national, IFR/VFR, scheduled/non-scheduled, private); 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 CAAB in grouping aerodromes/heliports for the production/distribution/ provision of information purposes (e.g. international/national; primary/secondary; major/other; civil/military; etc.).

### AD 2. AERODROMES

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

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

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

The requirement is for aerodrome geographical and administrative data including:

- 1) aerodrome reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of aerodrome reference point from centre of the city or town which the aerodrome serves;
- 3) aerodrome elevation to the nearest metre or foot, and reference temperature;
- 4) 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 administration, address, telephone, telefax and telex numbers and AFS 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 administration;
- 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

Brief description of passenger facilities available at the aerodrome, including:

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

- 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) surface and strength of aprons;
- 2) width, surface and strength of taxiways;
- 3) location and elevation to the nearest metre or foot of altimeter checkpoints;

- 4) location of VOR checkpoints;
- 5) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- 6) remarks.

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

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

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

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

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

Detailed description of obstacles, including:

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

Note 1.— Chapter 10, 10.2.2, provides a description of Area 2 while Appendix 8, Figure A8-2, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.

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

- 2) obstacles in Area 3:
  - a) obstacle identification or designation;
  - b) type of obstacle;
  - c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
  - d) obstacle elevation and height to the nearest metre or foot;
  - e) obstacle marking, and type and colour of obstacle lighting (if any);
  - f) if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6; and
  - g) NIL indication, if appropriate.

Note 1.— Chapter 10, 10.2.3, provides a description of Area 3 while Appendix 8, Figure A8-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

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

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

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

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

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

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

- 1) designations;
- 2) true bearings to one-hundredth of a degree;
- 3) dimensions of runways to the nearest metre or foot;
- 4) strength of pavement (PCN and associated data) and surface of each runway and associated stopways;
- 5) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end, and geoid undulation to the nearest one-half metre or foot for each threshold;
- 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 one-half metre or foot;
- 7) slope of each runway and associated stopways;
- 8) dimensions of stopway (if any) to the nearest metre or foot;
- 9) dimensions of clearway (if any) to the nearest metre or foot;
- 10) dimensions of strips;
- 11) the existence of an obstacle-free zone; and
- 12) remarks.

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

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

- 1) runway designator;
- 2) take-off run available;
- 3) take-off distance available;
- 4) accelerate-stop distance available;
- 5) landing distance available; and

## 6) remarks.

If a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this must be declared and the words “not usable” or the abbreviation “NU” entered (ANO (AD) A.1, Volume I, Attachment A, Section 3).

## \*\*\*\* AD 2.14 Approach and runway lighting

Detailed description of approach and runway lighting, including:

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

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

Description of other lighting and secondary power supply, including:

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

## \*\*\*\* AD 2.16 Helicopter landing area

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

- 1) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation to the nearest one-half metre or foot of the geometric centre of touchdown and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area (where appropriate);
- 2) TLOF and/or FATO area elevation:
  - for non-precision approaches, to the nearest metre or foot; and
  - for precision approaches, to the nearest one-half metre or foot;
- 3) TLOF and FATO area dimensions to the nearest metre or foot, surface type, bearing strength and marking;
- 4) true bearings to one-hundredth of a degree of FATO;
- 5) declared distances available, to the nearest metre or foot;
- 6) approach and FATO lighting; and
- 7) remarks.

## \*\*\*\* AD 2.17 Air traffic services airspace

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

- 1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- 2) vertical limits;
- 3) airspace classification;
- 4) call sign and language(s) of the ATS unit providing service;

- 5) transition altitude; and
- 6) remarks.

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

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

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

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

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

- 1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS, basic GNSS, SBAS, and GBAS and for VOR/ILS also station declination to the nearest degree used for technical line-up of the aid;
- 2) identification, if required;
- 3) frequency(ies), as appropriate;
- 4) hours of operation, as appropriate;
- 5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft); and
- 7) remarks.

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

\*\*\*\* AD 2.20 Local traffic regulations

Detailed description of regulations applicable to the traffic at the aerodrome including standard routes for taxiing aircraft, parking regulations, school and training flights and similar 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; and

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

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

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

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

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

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

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

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

### AD 3. HELIPORTS

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

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

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

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

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

- 1) heliport reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of heliport reference point from centre of the city or town which the heliport serves;
- 3) heliport elevation to the nearest metre or foot, and reference temperature;
- 4) 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 administration, address, telephone, telefax and telex numbers and AFS 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 administration;
- 2) customs and immigration;
- 3) health and sanitation;
- 4) AIS briefing office;
- 5) ATS reporting office (ARO);
- 6) MET briefing office;
- 7) air traffic service;
- 8) fuelling;
- 9) handling;
- 10) security;
- 11) de-icing; and
- 12) remarks.

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

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

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

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

Brief description of passenger facilities available at the heliport, 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;

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

- 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 helicopter; and
- 4) remarks.

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

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

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

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

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

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

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

**\*\*\*\* AD 3.9 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**

Detailed description of obstacles, including:

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

Note 1.— Chapter 10, 10.2.2, provides a description of Area 2 while Appendix 8, Figure A8-2, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.

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



## 2) obstacles in Area 3:

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

Note 1.— Chapter 10, 10.2.3, provides a description of Area 3 while Appendix 8, Figure A8-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

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

## \*\*\*\* AD 3.11 Meteorological information provided

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

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

## \*\*\*\* AD 3.12 Heliport data

Detailed description of heliport dimensions and related information, including:

- 1) heliport type — surface-level, elevated or helideck;
- 2) touchdown and lift-off (TLOF) area dimensions to the nearest metre or foot;
- 3) true bearings to one-hundredth of a degree of final approach and take-off (FATO) area;
- 4) dimensions to the nearest metre or foot of FATO, and surface type;
- 5) surface and bearing strength in tonnes (1 000 kg) of TLOF;
- 6) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation to the nearest one-half metre or foot of the geometric centre of TLOF or of each threshold of FATO (where appropriate);
- 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 one-half metre or 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;
- 2) rejected take-off distance available;
- 3) landing distance available; and
- 4) remarks.

## \*\*\*\* AD 3.14 Approach and FATO lighting

Detailed description of approach and FATO lighting, including:

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

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

Description of other lighting and secondary power supply, including:

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

## \*\*\*\* AD 3.16 Air traffic services airspace

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

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

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

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

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

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

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

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

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

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

\*\*\*\* AD 3.19 Local traffic regulations

Detailed description of regulations applicable to traffic at the heliport, including standard routes for taxiing helicopters, parking regulations, school and training flights and similar 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; and
- 3) description of ground marking/lighting for use under low visibility procedures.

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

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

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

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

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

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

**APPENDIX 2. SNOWTAM FORMAT**

(see Chapter 5, 5.2.3)

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

SNOWTAM	(Serial number) →	
(AERODROME LOCATION INDICATOR)	A)	→
(DATE/TIME OF OBSERVATION (Time of completion of measurement in UTC))	B)	→
(RUNWAY DESIGNATORS)	C)	→
(CLEARED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))	D)	→
(CLEARED RUNWAY WIDTH, IF LESS THAN PUBLISHED WIDTH (m; if offset left or right of centre line add "L" or "R"))	E)	→
(DEPOSITS OVER TOTAL RUNWAY LENGTH (Observed on each third of the runway, starting from threshold having the lower runway designation number))	F)	
NIL — CLEAR AND DRY 1 — DAMP 2 — WET or water patches 3 — RIME OR FROST COVERED (depth normally less than 1 mm) 4 — DRY SNOW 5 — WET SNOW 6 — SLUSH 7 — ICE 8 — COMPACTED OR ROLLED SNOW 9 — FROZEN RUTS OR RIDGES)		→
(MEAN DEPTH (mm) FOR EACH THIRD OF TOTAL RUNWAY LENGTH)	G)	→
(FRICTION MEASUREMENTS ON EACH THIRD OF RUNWAY AND FRICTION MEASURING DEVICE)	H)	
MEASURED OR CALCULATED COEFFICIENT or ESTIMATED SURFACE FRICTION 0.40 and above GOOD — 5 0.39 to 0.38 MEDIUM/GOOD — 4 0.35 to 0.30 MEDIUM — 3 0.29 to 0.28 MEDIUM/POOR — 2 0.25 and below POOR — 1 9 — unreliable UNRELIABLE — 9 (When quoting a measured coefficient, use the observed two figures, followed by the abbreviation of the friction measuring device used. When quoting an estimate, use single digit)		→
(CRITICAL SNOWBANKS (If present, insert height (cm)/distance from the edge of runway (m) followed by "L", "R" or "LR" if applicable))	J)	→
(RUNWAY LIGHTS (If obscured, insert "YES" followed by "L", "R" or both "LR" if applicable))	K)	→
(FURTHER CLEARANCE (If planned, insert length (m)/width (m) to be cleared or if to full dimensions, insert "TOTAL"))	L)	→
(FURTHER CLEARANCE EXPECTED TO BE COMPLETED BY . . . (UTC))	M)	→
(TAXIWAY (If no appropriate taxiway is available, insert "NO"))	N)	→
(TAXIWAY SNOWBANKS (If more than 60 cm, insert "YES" followed by distance apart, m))	P)	→
(APRON (If unusable insert "NO"))	R)	→
(NEXT PLANNED OBSERVATION/MEASUREMENT IS FOR) (month/day/hour in UTC)	S)	→
(PLAIN-LANGUAGE REMARKS (Including contaminant coverage and other operationally significant information, e.g. sanding, de-icing))	T)	)≡≡≡
NOTES: 1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2. 2. Information on other runways, repeat from C to P. 3. Words in brackets ( ) not to be transmitted.		

SIGNATURE OF ORIGINATOR (not for transmission)

### INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

#### 1. General

- a) When reporting on two or three runways, repeat Items C to P inclusive.
- b) Items together with their indicator must be dropped completely, where no information is to be included.
- c) Metric units must be used and the unit of measurement not reported.
- d) The maximum validity of SNOWTAM is 24 hours. New SNOWTAM must be issued whenever there is a significant change in conditions. The following changes relating to runway conditions are considered as significant:
  - 1) a change in the coefficient of friction of about 0.05;
  - 2) changes in depth of deposit greater than the following: 20 mm for dry snow, 10 mm for wet snow, 3 mm for slush;
  - 3) a change in the available length or width of a runway of 10 per cent or more;
  - 4) any change in the type of deposit or extent of coverage which requires reclassification in Items F or T of the SNOWTAM;
  - 5) when critical snow banks exist on one or both sides of the runway, any change in the height or distance from centre line;
  - 6) any change in the conspicuity of runway lighting caused by obscuring of the lights;
  - 7) any other conditions known to be significant according to experience or local circumstances.
- e) The abbreviated heading “TTAAiiii CCCC MMYYGg (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-figure group;

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

MMYYGg = date/time of observation/measurement, whereby: MM = month, e.g. January = 01, December = 12

YY = day of the month

GGg = time in hours (GG) and minutes (g) UTC;

(BBB) = optional group for: Correction to SNOWTAM 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 SNOWTAM No. 149 from Zurich, measurement/observation of 7 November at 0620 UTC:

SWLS0149 LSZH 11070620

2. *Item A* — Aerodrome location indicator (four-letter location indicator).
3. *Item B* — Eight-figure date/time group — giving time of observation as month, day, hour and minute in UTC; this item must always be completed.
4. *Item C* — Lower runway designator number.
5. *Item D* — Cleared runway length in metres, if less than published length (see Item T on reporting on part of runway not cleared).

6. *Item E* — Cleared runway width in metres, if less than published width; if offset left or right of centre line, add “L” or “R”, as viewed from the threshold having the lower runway designation number.

7. *Item F* — Deposit over total runway length as explained in SNOWTAM Format. Suitable combinations of these numbers may be used to indicate varying conditions over runway segments. If more than one deposit is present on the same portion of the runway, they should be reported in sequence from the top to the bottom. Drifts, depths of deposit appreciably greater than the average values or other significant characteristics of the deposits may be reported under Item T in plain language.

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

8. *Item G* — Mean depth in millimetres deposit for each third of total runway length, or “XX” if not measurable or operationally not significant; the assessment to be made to an accuracy of 20 mm for dry snow, 10 mm for wet snow and 3 mm for slush.

9. *Item H* — Friction measurements on each third of the runway and friction measuring device. Measured or calculated coefficient (two digits) or, if not available, estimated surface friction (single digit) in the order from the threshold having the lower runway designation number. Insert a code 9 when surface conditions or available friction measuring device do not permit a reliable surface friction measurement to be made. Use the following abbreviations to indicate the type of friction measuring device used:

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

If other equipment is used, specify in plain language.

10. *Item J* — Critical snowbanks. If present insert height in centimetres and distance from edge of runway in metres, followed by left (“L”) or right (“R”) side or both sides (“LR”), as viewed from the threshold having the lower runway designation number.

11. *Item K* — If runway lights are obscured, insert “YES” followed by “L”, “R” or both “LR”, as viewed from the threshold having the lower runway designation number.

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

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

14. *Item N* — The code for Item F may be used to describe taxiway conditions; enter “NO” if no taxiways serving the associated runway are available.

15. *Item P* — If applicable, enter “YES” followed by the lateral distance in metres.

16. *Item R* — The code for Item F may be used to describe apron conditions; enter “NO” if the apron is unusable.

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

18. *Item T* — Describe in plain language any operationally significant information but always report on length of uncleared runway (Item D) and extent of runway

contamination (Item F) for each third of the runway (if appropriate) in accordance with the following scale:

- Runway contamination — 10% — if less than 10% of runway contaminated
- Runway contamination — 25% — if 11–25% of runway contaminated
- Runway contamination — 50% — if 26–50% of runway contaminated
- Runway contamination — 100% — if 51–100% of runway contaminated.

#### EXAMPLE OF COMPLETED SNOWTAM FORMAT

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

#### Definitions of the various types of snow

**Slush.** Water-saturated snow which with a heel-and-toe slapdown motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

*Note.— Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.*

#### **Snow (on the ground).**

- a) *Dry snow.* Snow which can be blown if loose or, if compacted by hand, will fall apart again upon release; specific gravity: up to but not including 0.35.
- b) *Wet snow.* Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.
- c) *Compacted snow.* Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.

**APPENDIX 3. ASHTAM FORMAT**

*(see Chapter 5, 5.2.4)*

(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><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>See also Appendix 5 regarding addressee indicators used in predetermined distribution systems.</li> <li>Enter ICAO nationality letter as given in ICAO Doc 7910, Part 2.</li> <li>See paragraph 3.5 below.</li> <li>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>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 section 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 must be issued whenever there is a change in the level of alert.

### 2. *Abbreviated heading*

2.1 Following the usual 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 ICAO *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691), Appendix H, 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 the ICAO *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691), Appendix H, 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
RED ALERT	Volcanic eruption in progress. Ash plume/cloud reported above FL 250.
	<i>or</i>
ORANGE ALERT	Volcano dangerous, eruption likely, with ash plume/cloud expected to rise above FL 250.
	Volcanic eruption in progress but ash plume/cloud not reaching nor expected to reach FL 250.
	<i>or</i>
YELLOW ALERT	Volcano dangerous, eruption likely but ash plume/cloud not expected to reach FL 250.
	Volcano known to be active from time to time and volcanic activity has recently increased significantly, volcano not currently considered dangerous but caution should be exercised.
	<i>or</i>
GREEN ALERT	(After an eruption, i.e. change in alert to yellow from red or orange.) Volcanic activity has decreased significantly, volcano not currently considered dangerous but caution should be exercised.
	Volcanic activity considered to have ceased and volcano reverted to its normal state.

*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* — Source of the information, e.g. “special air-report” or “vulcanological agency”, etc. The source of information 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.

## APPENDIX 4. INFORMATION TO BE NOTIFIED BY AIRAC

### PART 1

1. The establishment, withdrawal of, and premeditated significant changes (including operational trials) to:

1.1 Limits (horizontal and vertical), regulations and procedures applicable to:

- a) flight information regions;
- b) control areas;
- c) control zones;
- d) advisory areas;
- e) ATS routes;
- f) permanent danger, prohibited and restricted areas (including type and periods of activity when known) and ADIZ;
- g) permanent areas or routes or portions thereof where the possibility of interception exists.

1.2 Positions, frequencies, call signs, known irregularities and maintenance periods of radio navigation aids and communication facilities.

1.3 Holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures.

1.4 Meteorological facilities (including broadcasts) and procedures.

1.5 Runways and stopways.

### PART 2

2. The establishment and withdrawal of, and premeditated significant changes to:

2.1 Position, height and lighting of navigational obstacles.

2.2 Taxiways and aprons.

2.3 Hours of service: aerodromes, facilities and services.

2.4 Customs, immigration and health services.

2.5 Temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft.

2.6 Temporary areas or routes or portions thereof where the possibility of interception exists.

#### **APPENDIX 5. PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM**

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

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

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

1) *First and second letters:*

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

2) *Third and fourth letters:*

The letters “ZZ” indicating a requirement for special distribution.

3) *Fifth letter:*

The fifth letter differentiating between NOTAM (letter “N”), SNOWTAM (letter “S”), and ASHTAM (letter “V”).

4) *Sixth and seventh letters:*

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

*Note.— The fifth, sixth and seventh letters replace the threeletter designator YNY which, in the normal distribution system, denotes an international NOTAM office.*

5) *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.

**APPENDIX 6. NOTAM FORMAT**

(see Chapter 5, 5.2.1)

Priority Indicator												→
Address												
												≡
Date and time of filing												→
Originator's Indicator												≡ (
<b>Message Series, Number and Identifier</b>												
NOTAM containing new information			.....		NOTAMN							
			(series and number/year)									
NOTAM replacing a previous NOTAM			.....		NOTAMR.....		(series and number/year of NOTAM to be replaced)					
			(series and number/year)									
NOTAM cancelling a previous NOTAM			.....		NOTAMC.....		(series and number/year of NOTAM to be cancelled)					≡
			(series and number/year)									
<b>Qualifiers</b>												
	FIR	NOTAM Code	Traffic	Purpose	Scope	Lower Limit	Upper Limit	Coordinates, Radius				
Q)		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* 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****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 two-digit number for the year (e.g. A0023/03).

**3. Qualifiers (Item Q)**

Item Q) is divided in eight fields, each separated by a stroke. If no entry is to be made in a field, it is not necessary to transmit blanks between the strokes. Examples of how fields are to be filled are shown in the *Aeronautical Information Services Manual* (Doc 8126). The definition of the field is as follows:

## 1) FIR

- a) ICAO location indicator of affected FIR or, if applicable to more than one FIR within a State, the first two letters of the ICAO location indicator of a State plus “XX”. 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 of the subject reported upon. For combinations of second and third and fourth and fifth letters, insert the ICAO NOTAM codes listed in the PANS-ABC (Doc 8400) or in the NOTAM Selection Criteria contained in the *Aeronautical Information Services Manual* (Doc 8126) or insert one of the following combinations, as appropriate:

- a) If the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the second and third letters (e.g. QXXAK);
- 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 Appendix 4 and Chapter 6 and when it is used to announce 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-OPERATIVE) SUBJECT TO PREVIOUSLY PUBLISHED LIMITATIONS/CONDITIONS
- AO : OPERATIONAL
- CC : COMPLETED
- XX : PLAIN LANGUAGE

### 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. For possible combinations refer to the NOTAM Selection Criteria in the Aeronautical Information Services Manual (Doc 8126).*

### 4) PURPOSE

N = NOTAM selected for the immediate attention of aircraft operators

B = NOTAM selected for PIB entry

O = NOTAM concerning flight operations

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

K = NOTAM is a checklist

*Note.— Depending on the NOTAM subject and content, the qualifier field PURPOSE may contain combined qualifiers. For possible combinations refer to the NOTAM Selection Criteria in the Aeronautical Information Services Manual (Doc 8126).*

### 5) SCOPE

A = Aerodrome

E = En-route

W = Nav Warning

K = NOTAM is a checklist

*Note.— Depending on the NOTAM subject and content, the qualifier field SCOPE may contain combined qualifiers. For possible combinations refer to the NOTAM Selection Criteria in the Aeronautical Information Services Manual (Doc 8126). If the subject is qualified AE, the aerodrome location indicator must be reported in Item A).*

### 6) and 7) LOWER/UPPER

LOWER and UPPER limits shall always be filled and shall only be expressed in flight levels (FL). 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 location indicator as contained in ICAO 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 date-time 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.

**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. 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 reference datum and units of measurement.

*Note.— For NOTAM examples see Doc 8126 and the PANS-ABC (Doc 8400).*

**APPENDIX 7. AERONAUTICAL DATA QUALITY REQUIREMENTS****Table A7-1. Latitude and longitude**

Latitude and longitude	Publication resolution	Integrity Classification
Flight information region boundary points . . . . .	1 min	$1 \times 10^{-3}$ routine
P, R, D area boundary points (outside CTA/CTZ boundaries) . . . . .	1 min	$1 \times 10^{-3}$ routine
P, R, D area boundary points (inside CTA/CTZ boundaries) . . . . .	1 sec	$1 \times 10^{-5}$ essential
CTA/CTZ boundary points . . . . .	1 sec	$1 \times 10^{-5}$ essential
En-route NAVAIDS and fixes, holding, STAR/SID points . . . . .	1 sec	$1 \times 10^{-5}$ essential
Obstacles in Area 1 (the entire State territory) . . . . .	1 sec	$1 \times 10^{-3}$ routine
Aerodrome/heliport reference point . . . . .	1 sec	$1 \times 10^{-3}$ routine
NAVAIDS located at the aerodrome/heliport . . . . .	1/10 sec	$1 \times 10^{-5}$ essential
Obstacles in Area 3 . . . . .	1/10 sec	$1 \times 10^{-5}$ essential
Obstacles in Area 2 . . . . .	1/10 sec	$1 \times 10^{-5}$ essential
Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure . . . . .	1/10 sec	$1 \times 10^{-5}$ essential
Runway threshold . . . . .	1/100 sec	$1 \times 10^{-8}$ critical
Runway end (flight path alignment point) . . . . .	1/100 sec	$1 \times 10^{-8}$ critical
Runway holding position . . . . .	1/100 sec	$1 \times 10^{-8}$ critical
Taxiway centre line/parking guidance line points . . . . .	1/100 sec	$1 \times 10^{-5}$ essential
Taxiway intersection marking line . . . . .	1/100 sec	$1 \times 10^{-5}$ essential
Exit guidance line . . . . .	1/100 sec	$1 \times 10^{-5}$ essential
Aircraft stand points/INS checkpoints . . . . .	1/100 sec	$1 \times 10^{-3}$ routine
Geometric centre of TLOF or FATO thresholds, heliports . . . . .	1/100 sec	$1 \times 10^{-8}$ critical
Apron boundaries (polygon) . . . . .	1/10 sec	$1 \times 10^{-3}$ routine
De-icing/anti-icing facility (polygon) . . . . .	1/10 sec	$1 \times 10^{-3}$ routine

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

Table A7-2. Elevation/altitude/height

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

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

**Table A7-3. Declination and magnetic variation**

Declination/variation	Publication resolution	Integrity Classification
VHF NAVAID station declination used for technical line-up . . . . .	1 degree	$1 \times 10^{-5}$ essential
NDB NAVAID magnetic variation . . . . .	1 degree	$1 \times 10^{-3}$ routine
Aerodrome/heliport magnetic variation . . . . .	1 degree	$1 \times 10^{-5}$ essential
ILS localizer antenna magnetic variation . . . . .	1 degree	$1 \times 10^{-5}$ essential
MLS azimuth antenna magnetic variation . . . . .	1 degree	$1 \times 10^{-5}$ essential

**Table A7-4. Bearing**

Bearing	Publication resolution	Integrity Classification
Airway segments . . . . .	1 degree	$1 \times 10^{-3}$ routine
En-route and terminal fix formations . . . . .	1/10 degree	$1 \times 10^{-3}$ routine
Terminal arrival/departure route segments . . . . .	1 degree	$1 \times 10^{-3}$ routine
Instrument approach procedure fix formations . . . . .	1/100 degree	$1 \times 10^{-5}$ essential
ILS localizer alignment (True) . . . . .	1/100 degree	$1 \times 10^{-5}$ essential
MLS zero azimuth alignment (True) . . . . .	1/100 degree	$1 \times 10^{-5}$ essential
Runway and FATO bearing (True) . . . . .	1/100 degree	$1 \times 10^{-3}$ routine

Table A7-5. Length/distance/dimension

Length/distance/dimension	Publication resolution	Integrity Classification
Airway segment length	1/10 km or 1/10 NM	$1 \times 10^{-3}$ routine
En-route fix formation distance	1/10 km or 1/10 NM	$1 \times 10^{-3}$ routine
Terminal arrival/departure route segment length	1/100 km or 1/100 NM	$1 \times 10^{-5}$ essential
Terminal and instrument approach procedure fix formation distance	1/100 km or 1/100 NM	$1 \times 10^{-5}$ essential
Runway and FATO length, TLOF dimensions	1 m or 1 ft	$1 \times 10^{-8}$ critical
Runway width	1 m or 1 ft	$1 \times 10^{-5}$ essential
Displaced threshold distance	1 m or 1 ft	$1 \times 10^{-3}$ routine
Clearway length and width	1 m or 1 ft	$1 \times 10^{-5}$ essential
Stopway length and width	1 m or 1 ft	$1 \times 10^{-8}$ critical
Landing distance available	1 m or 1 ft	$1 \times 10^{-8}$ critical
Take-off run available	1 m or 1 ft	$1 \times 10^{-8}$ critical
Take-off distance available	1 m or 1 ft	$1 \times 10^{-8}$ critical
Accelerate-stop distance available	1 m or 1 ft	$1 \times 10^{-8}$ critical
Runway shoulder width	1 m or 1 ft	$1 \times 10^{-5}$ essential
Taxiway width	1 m or 1 ft	$1 \times 10^{-5}$ essential
Taxiway shoulder width	1 m or 1 ft	$1 \times 10^{-5}$ essential
ILS localizer antenna-runway end, distance	1 m or 1 ft	$1 \times 10^{-3}$ routine
ILS glide slope antenna-threshold, distance along centre line	1 m or 1 ft	$1 \times 10^{-3}$ routine
ILS marker-threshold distance	1 m or 1 ft	$1 \times 10^{-5}$ essential
ILS DME antenna-threshold, distance along centre line	1 m or 1 ft	$1 \times 10^{-5}$ essential
MLS azimuth antenna-runway end, distance	1 m or 1 ft	$1 \times 10^{-3}$ routine
MLS elevation antenna-threshold, distance along centre line	1 m or 1 ft	$1 \times 10^{-3}$ routine
MLS DME/P antenna-threshold, distance along centre line	1 m or 1 ft	$1 \times 10^{-5}$ essential

## APPENDIX 8. TERRAIN AND OBSTACLE DATA REQUIREMENTS

(see Chapter 10)

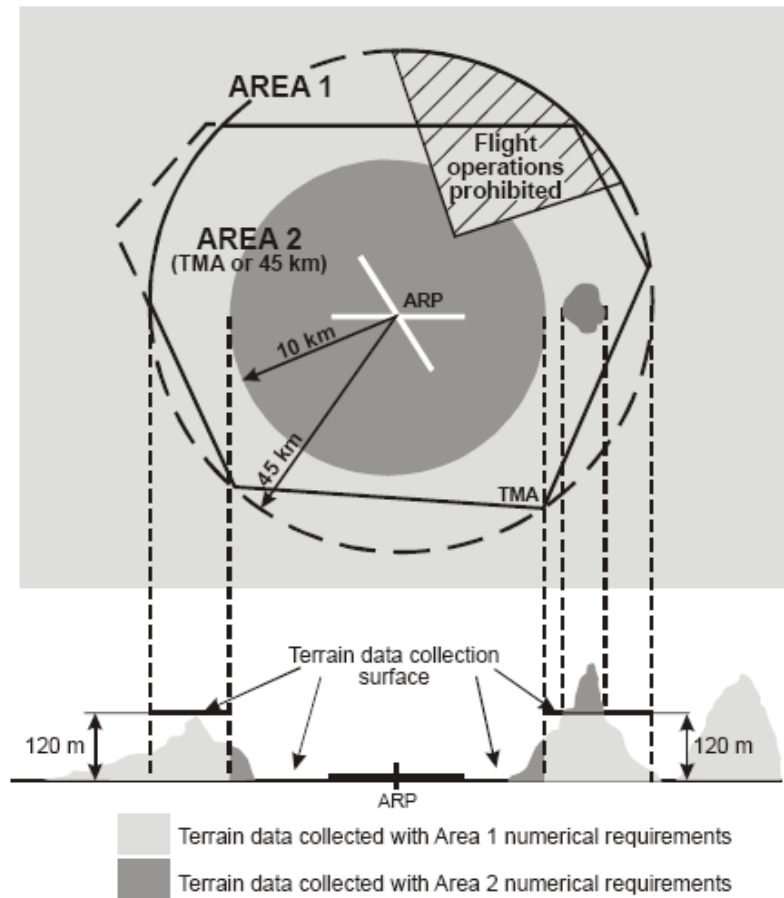
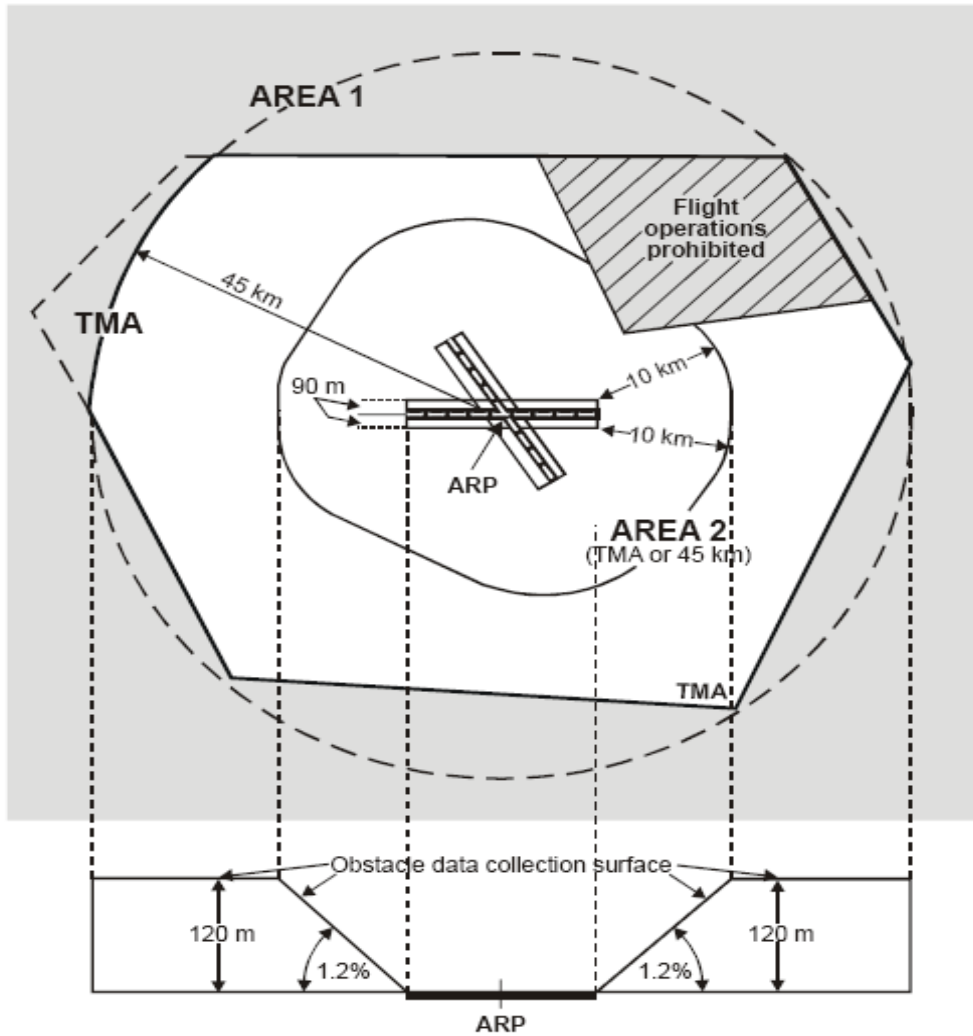


Figure A8-1. Terrain data collection surfaces — Area 1 and Area 2

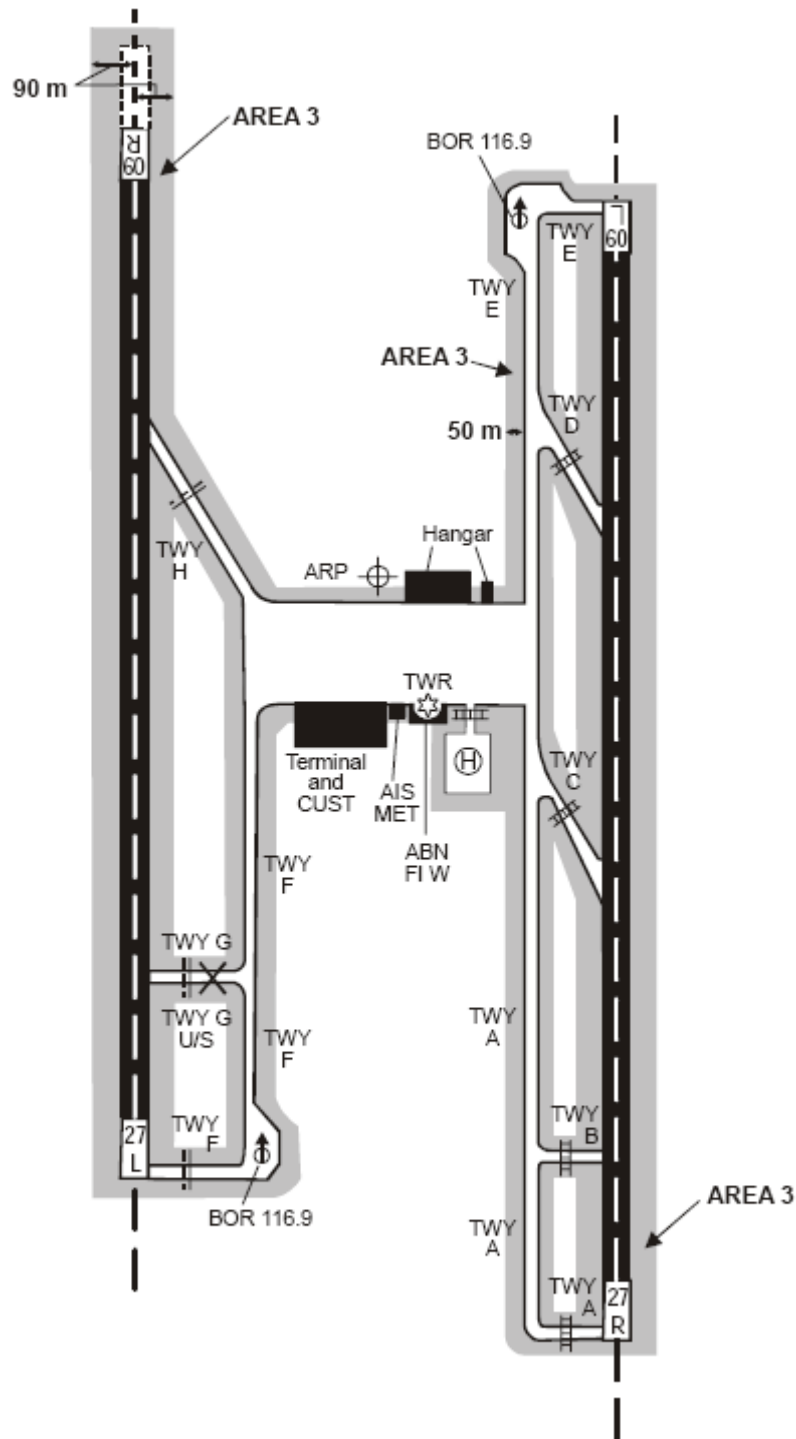
1. Within the area covered by a 10-km radius from the ARP, terrain data shall be collected and recorded in accordance with the Area 2 numerical requirements.
2. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plane 120 m above the lowest runway elevation shall be collected and recorded in accordance 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 be collected and recorded in accordance 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 only be collected and recorded in accordance with the Area 1 numerical requirements.

*Note.*— Terrain data numerical requirements for Areas 1 and 2 are specified in Table A8-1.



**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 Table A8-2:
  - a) any obstacle that penetrates the conical surface whose origin is at the edges of the 180-m wide rectangular area and at the nearest runway elevation measured along the runway centre line, extending at 1.2 per cent slope until it reaches 120 m above the lowest runway elevation of all operational runways at the aerodrome (1.2 per cent slope reaches 120 m at 10 km); in the remainder of Area 2 (between 10 km and the TMA boundary or 45-km radius, whichever is smaller), the horizontal surface 120 m above the lowest runway elevation; and
  - b) 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.
2. 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 Table A8-2.



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

1. Data on terrain and obstacles that extend more than a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome/heliport movement area shall be collected and recorded.
2. Terrain and obstacle data in Area 3 shall be collected and recorded in accordance with numerical requirements specified in Table A8-1 and Table A8-2, respectively.

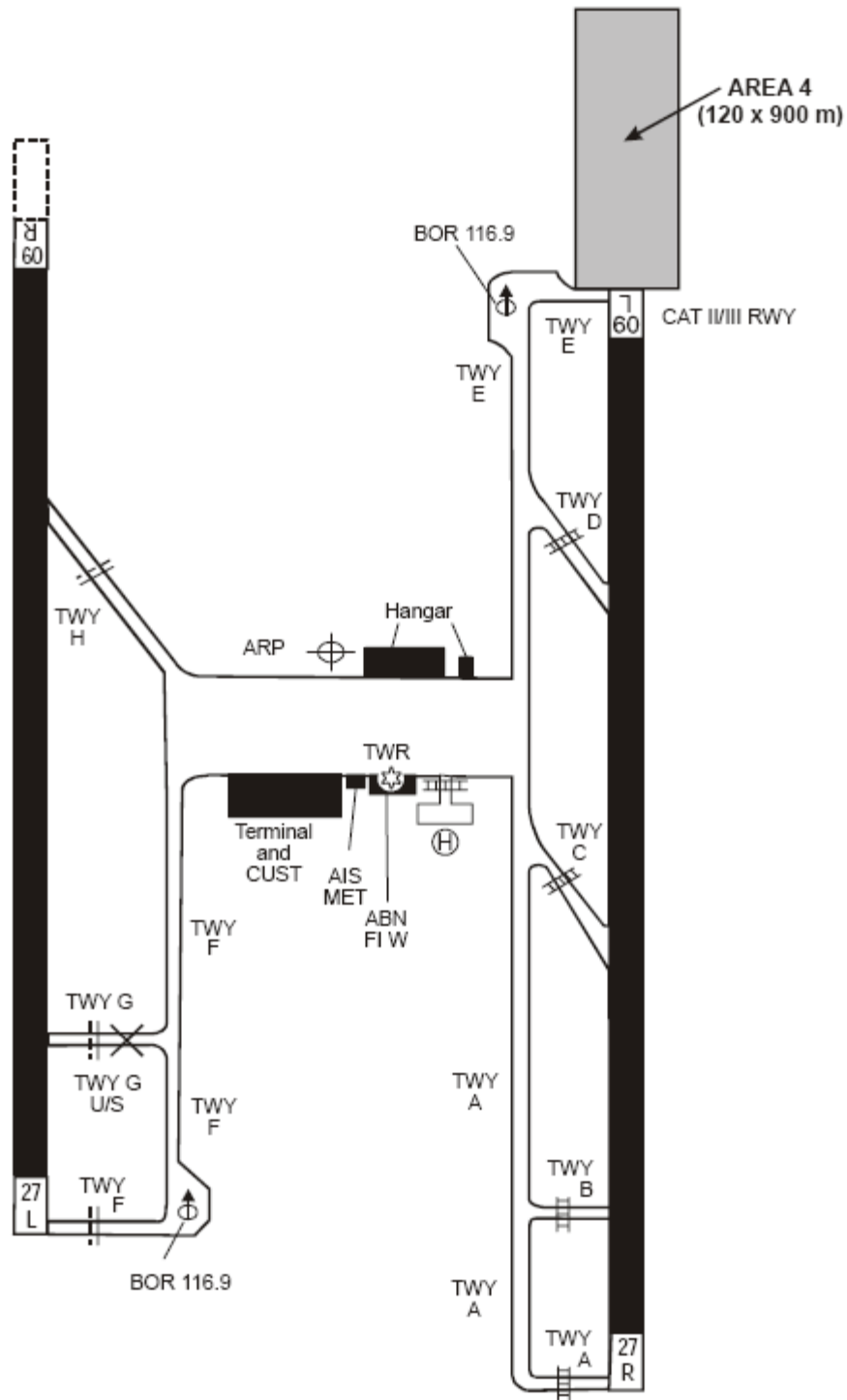


Figure A8-4. Terrain data collection surface — Area 4

Only terrain data shall be collected and recorded in Area 4 in accordance with the numerical requirements specified in Table A8-1.



**Table A8-1. Terrain data numerical requirements**

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

**Table A8-2. Obstacle data numerical requirements**

	Area 1	Area 2	Area 3
Vertical accuracy	30 m	3 m	0.5 m
Vertical resolution	1 m	0.1 m	0.01 m
Horizontal accuracy	50 m	5 m	0.5 m
Confidence level ( $1\sigma$ )	90%	90%	90%
Data classification	routine	essential	essential
Integrity level	$1 \times 10^{-3}$	$1 \times 10^{-5}$	$1 \times 10^{-5}$
Maintenance period	as required	as required	as required

**Table A8-3. Terrain attributes**

Terrain attribute	Mandatory/Optional
Area of coverage	Mandatory
Data originator 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	Mandatory
Recorded surface	Mandatory
Penetration level	Optional
Known variations	Optional
Integrity	Mandatory
Date and time stamp	Mandatory
Unit of measurement used	Mandatory

**Table A8-4. Obstacle attributes**

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

END