GHANA CIVIL AVIATION
(AIR NAVIGATION SERVICES)
DIRECTIVES

PART 15 – AERONAUTICAL INFORMATION SERVICES

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15.1 GENERAL

15.1.1 INTRODUCTION

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

15.1.2 DEFINITIONS

When the following terms are used in this Part, they shall have the following meanings:

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

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

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

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

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

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

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

Aeronautical information management (AIM). The dynamic, integrated management of aeronautical information through the provision and exchange

of quality-assured digital aeronautical data in collaboration with all parties.

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

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

AIS Section. The Section under the Directorate of the Air Navigation Services of the Authority responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

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

AIP Supplement. Temporary changes to the information contained in the AIP which are 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).

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

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*).

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

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

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

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

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

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

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

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

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

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

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

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

Canopy. Bare Earth supplemented by vegetation height.

Confidence level. The probability that the true value of a parameter is within a certain interval around the estimate of its value.

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

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

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

alteration of data.

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

Data 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*).

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.

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*).

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

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*).

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.

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

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*).

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.

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

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

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

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

International airport. Any airport designated by Ghana 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). The NOTAM office of the Authority 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*).

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 them manoeuvring area and the apron(s).

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

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

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

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

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

a) are located on an area intended for the surface movement of aircraft;

or

b) extend above a defined surface intended to protect aircraft in flight; or

c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

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

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

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

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

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

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.

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*).

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

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

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

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

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

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

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

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.

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

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

Traceability. Ability to trace the history, application or location of an entity by means of recorded identifications (ISO 8402*).

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*).

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.

15.1.2 COMMON REFERENCE SYSTEMS FOR AIR NAVIGATION

15.1.2.1 HORIZONTAL REFERENCE SYSTEM

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

(2) In precise geodetic applications and some air navigation applications, the AIS Section shall ensure that temporal changes in the tectonic plate motion and tidal effects on the Earth's crust are modeled and estimated. To reflect the temporal effect, an epoch shall be included with any set of absolute station coordinates.

(3) The AIS Section shall ensure that Geographical coordinates that have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements of Section 2 of Part 24 and Section 2 of Part 14 are identified by an asterisk.

(4) The AIS Section shall ensure that the order of publication resolution of geographical coordinates shall be that specified in Table A7-1 of IS: 15.3.3.2 while the order of chart resolution of geographical coordinates shall be that specified in Table 1 of IS: 21.2.17.2 in Part 21.

15.1.2.2 VERTICAL REFERENCE SYSTEM

(1) The AIS Section shall use Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, as the vertical reference system for international air navigation.

(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 global gravity model.

(3) The AIS Section shall ensure that at those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation specified in Parts 14 and 30 on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data are 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).

(4) The AIS Section shall ensure that 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 IS: 15.4 are also published.

(5) The AIS Section shall ensure that the order of publication resolution of elevation and geoid undulation shall be that specified in IS: 15.4 and Table A7-2 of IS: 15.3.3.2 while the order of chart resolution of elevation and geoid undulation shall be that specified in Part 21, IS: 21.2.18.3, Table 2.

15.1.2.3 TEMPORAL REFERENCE SYSTEM

(1) The AIS Section shall use the Gregorian calendar and Coordinated Universal Time (UTC) as the temporal reference system for domestic and international air navigation.

(2) Where 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, the AIS Section shall include either a description of that system or a citation for a document that describes that temporal reference system.

15.1.2.4 MISCELLANEOUS SPECIFICATIONS

(1) The AIS Section shall ensure that each element of the Integrated Aeronautical Information Package for international distribution includes English text for those parts expressed in plain language.

(2) The AIS Section shall ensure that place names are spelt in conformity with local usage, transliterated, when necessary, into the Latin alphabet.

(3) The AIS Section shall use ICAO abbreviations whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information.

15.2 RESPONSIBILITIES AND FUNCTIONS

15.2.1 STATE RESPONSIBILITIES

(1) Under the Ghana Civil Aviation Act, as amended, the Authority shall provide information necessary for the safety, regularity and efficiency of international air navigation by means of publications issued by the Authority or by any other means.

(2) The Authority shall take all necessary measures to ensure that the aeronautical data and aeronautical information it provides, covers the territory of the Republic of Ghana, as well as the Accra Flight Information Region.

(3) The Authority shall remain responsible for the aeronautical data and aeronautical information published under the authority vested by the Ghana Civil Aviation Act.

(4) The AIS Section shall ensure that the aeronautical data and aeronautical information provided are complete, timely and of required quality in accordance with 15.3.3.

(5) The Authority shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information and the AIS in relation to the timely and complete provision of aeronautical data and aeronautical information.

15.2.2 AIS RESPONSIBILITIES AND FUNCTIONS

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

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

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

(2) The AIS Section shall receive, collate or assemble, edit, format, publish/store and distribute aeronautical data and aeronautical information concerning the entire territory of the Republic of Ghana as well as areas within the Accra Flight Information Region. Aeronautical data and aeronautical information shall be provided as an Integrated Aeronautical Information Package.

(3) Where 24-hour service is not provided, the AIS Section shall ensure that service shall be available during the whole period an aircraft is in flight within the Accra Flight Information Region, plus a period of at least two hours before and after such a period. Service shall also be available at such other time as may be requested by an appropriate ground organization.

(4) The AIS Section shall, in addition, obtain information to enable it provide pre-flight information services and to meet the need for in-flight information:

(a) from the AIS of other States;

(b) from other sources that may be available.

(5) The AIS Section shall ensure that aeronautical data and aeronautical information obtained under 15.2.2(4)(a) are, when distributed, clearly identified as having the authority of the Republic of Ghana.

(6) The AIS Section shall ensure that Aeronautical data and aeronautical information obtained under 15.2.2(4)(b) shall, if possible, be verified before distribution and if not verified shall, when distributed, be clearly identified as such.

(7) The AIS Section shall promptly make available to the AIS of other States any aeronautical data and aeronautical information necessary for the safety, regularity or efficiency of air navigation required by them, to enable them to comply with 15.2.2(1).

15.2.3 EXCHANGE OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

(1) All elements of the Integrated Aeronautical Information Package originated by other States shall be addressed to the AIS Section. The AIS Section shall respond to requests for aeronautical information and aeronautical data originated by other States.

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

(3) The Authority shall, wherever practicable, establish direct contact between aeronautical information services in order to facilitate the international exchange of aeronautical data and aeronautical information.

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

(5) The exchange of more than one copy of the elements of the Integrated Aeronautical Information Package and other air navigation documents, including those containing air navigation legislation and regulations/Directives, shall be subject to bilateral agreement between the Authority and other ICAO Contracting States.

(6) The procurement of aeronautical data and aeronautical information, including the elements of the Integrated Aeronautical Information Package, and other air navigation documents, including those containing air navigation legislation and regulations, by States other than ICAO Contracting States and by other entities shall be subject to separate agreement with the Authority.

15.2.4 COPYRIGHT

Any product of the AIS Section of the Authority which has been granted copyright protection by Ghana and provided to another State in accordance with 15.2.3 shall only be made available to a third party on the condition that the third party is made aware that the product is copyright protected and provided that it is appropriately annotated that the product is subject to copyright by the Authority.

15.2.5 COST RECOVERY

The overhead cost of collecting and compiling aeronautical data and aeronautical information shall be included in the cost basis for airport and air navigation services charges.

15.3 AERONAUTICAL INFORMATION MANAGEMENT

15.3.1 INFORMATION MANAGEMENT REQUIREMENT

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

15.3.2 AERONAUTICAL DATA AND AERONAUTICAL INFORMATION VALIDATION AND VERIFICATION

(1) Material to be issued as part of the Integrated Aeronautical Information Package shall be thoroughly checked before it is submitted to the AIS, in order to make certain that all necessary information has been included and that it is correct in detail prior to distribution.

(2) The AIS Section shall establish verification and validation procedures, which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements (accuracy, resolution, integrity and traceability) are met.

15.3.3 DATA QUALITY SPECIFICATION

15.3.3.1 ACCURACY

The AIS Section shall ensure that the order of accuracy for aeronautical data shall be as specified in Part 24, Subpart 2, and Subpart 2 of Parts 14 and 30. 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 (e.g. flight information region boundary points).

Note.— The accuracy requirements for electronic terrain and obstacle data are specified in IS: 15.10.2.

15.3.3.2 RESOLUTION

(1) The AIS Section shall ensure that the order of publication resolution of aeronautical data shall be as specified in I.S.15.3.3.2.

(2) The resolution of the data features contained in the database shall be commensurate with the data accuracy requirements.

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

15.3.3.3 INTEGRITY

(1) The AIS Section shall ensure that the integrity classification for aeronautical data shall be as specified in Tables A7-1 to A7-5 of IS: 15.3.3.2

(2) The AIS Section shall ensure that the integrity of aeronautical data shall be maintained throughout the data process from survey or origin to distribution to the next intended user (the entity that receives the aeronautical information from the AIS provider). Based on the applicable integrity classification, the validation and verification procedures shall:

(a) **for routine data**: avoid corruption throughout the processing of the data;

(b) **for essential data**: assure corruption does not occur at any stage of the entire process and include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

(c) **for critical data**: assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note 1.— Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and EUROCAE Document ED-76 — Standards for Processing Aeronautical Data.

Note 2.— Error-producing faults in the entire process may be mitigated by additional data quality assurance techniques as may be required. These could include application tests for critical data (for example, by flight check); the use of security, logic, semantic, comparison, and redundancy checks; digital error detection; and the qualification of human resources and process tools such as hardware and software.

Note 3.— Distribution to the next intended user will differ in the delivery method applied which may either be:

Physical distribution. The means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package, such as postal services; or

Direct electronic distribution. The means by which aeronautical data and aeronautical information distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.

Note 4.— Different delivery methods and data media may require different procedures to ensure the required data quality.

15.3.4 METADATA

(1) The AIS Section shall collect and retain Metadata for aeronautical data processes and

exchange points. This metadata collection shall be applied throughout the aeronautical information data chain, from survey or origin to distribution to the next intended user.

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

(a) the name of the organizations or entities performing any action of originating, transmitting or manipulating the data;

(b) the action performed; and

(c) the date and time the action was performed.

15.3.5 DATA PROTECTION

(1) The AIS Section shall protect aeronautical data and data sets in accordance with data error detection, security, and authentication techniques as approved by the Authority.

Note.— Doc 8126 contains guidance material on data error detection, security and authentication techniques.

(2) The AIS Section shall protect electronic aeronautical data by the inclusion in the data sets of a 32-bit Cyclic Redundancy Check (CRC) implemented by the application dealing with the data sets. This shall apply to the protection of the integrity classification of data sets as specified in 15.3.3.3.

Note 1.— This requirement does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in Doc 8126.

15.3.6 USE OF AUTOMATION

(1) The Authority shall introduce automation with the objective of improving the timeliness, quality, efficiency and cost- effectiveness of aeronautical information services.

Note.— Guidance material on the development of databases and the establishment of data exchange services may be found in Doc 8126.

(2) Where aeronautical data and aeronautical information are provided in multiple formats, the AIS Section shall implement processes to ensure data and information consistency between formats.

(3) The AIS Section shall submit these processes for approval by the Authority.

(4) In order to meet the data quality requirements, automation shall:

(a) enable digital aeronautical data exchange between the parties involved in the data

processing chain; and

(b) use aeronautical information exchange models and data exchange models designed to be globally interoperable.

Note.— Guidance material on the aeronautical information and data exchange models may be found in Doc 8126.

(5) The AIS Section shall ensure that the aeronautical information model used shall encompass the aeronautical data and aeronautical information to be exchanged.

(6) The aeronautical information model used by the AIS Section shall:

(a) use the Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations and data types;

(b) include data value constraints and data verification rules;

(c) include provisions for metadata as specified in 15.3.4(2); and

(d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.

(7) The aeronautical data exchange model used by the AIS Section shall:

(a) apply a commonly used data encoding format;

(b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in 15.3.6(5); and

(c) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.

15.3.7 QUALITY MANAGEMENT SYSTEM

(1) The AIS Section shall implement and maintain quality management systems encompassing all functions of AIS, as outlined in 15.2.2. The execution of such quality management systems shall be made demonstrable for each function stage.

(2) The AIS Section shall ensure that Quality management shall be applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.

(3) The AIS Section shall ensure that the quality management system established in accordance with 15.3.7(1) shall follow the ISO 9000 series of quality assurance standards, and be certified by an approved organization.

(4) The AIS Section shall ensure that within the context of the established quality management system, the competencies and the associated knowledge, skills and abilities required for each function shall be identified, and AIS personnel assigned to perform those functions shall be appropriately trained. The AIS Section shall have processes in place to ensure that AIS personnel possess the competencies required to perform specific assigned functions. Appropriate records shall be maintained by the AIS Section so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

(5) The AIS Section shall ensure that the quality management system includes the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data are traceable throughout the aeronautical information data chain so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.

(6) The AIS Section shall ensure that the established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements for accuracy, resolution and integrity as specified in 15.3.2 and 15.3.3 and that the data traceability requirements are met through the provision of appropriate metadata as specified in 15.3.4. The system shall also provide assurance of the applicability period of intended use of aeronautical data and aeronautical information as well as that the agreed distribution dates will be met.

(7) The Authority shall take all necessary measures to monitor compliance with the quality management system in place.

(8) Demonstration of compliance of the quality management system applied shall be by audit. If a nonconformity is identified, initiating action to correct its cause shall be determined and taken without undue delay. All audit observations and remedial actions shall be evidenced and properly documented.

15.3.8 HUMAN FACTORS CONSIDERATIONS

(1) The AIS Section shall take into consideration human factors principles in its organization as well as the design, contents, processing and distribution of aeronautical data and aeronautical information to facilitate their optimum utilization.

(2) The AIS Section shall give due consideration to the integrity of information where human interaction is required and ensure mitigating steps are taken where risks are identified.

15.4 AERONAUTICAL INFORMATION PUBLICATION (AIP)

15.4.1 CONTENTS

(1) The AIS Section shall publish the GHANA AIP which 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 IS: 15.4 that appear in Roman type, except that when the AIP, or volume of the AIP, is designed basically to facilitate operational use in flight, the precise format and arrangement may be left to the discretion of the Authority, provided that an adequate table of contents is included.

(2) The GHANA AIP shall, in addition, contain current information relating to those subjects enumerated in IS: 15.4 that appear in italic type.

(3) The GHANA AIP 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 Directives and practices of the Authority and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to differentiate readily between the requirements of the Authority and the related ICAO provisions;

(d) the choice made by the Authority in each significant case where an alternative course of action is provided for in ICAO Standards, Recommended Practices and Procedures.

(4) The aeronautical charts listed alphabetically below shall, when available for designated international aerodromes/ heliports, form part of the GHANA 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.

(5) Charts, maps or diagrams shall be used, when appropriate, to complement or as a substitute for the tabulations or text of GHANA AIP.

15.4.2 GENERAL SPECIFICATIONS

(1) The GHANA AIP shall be self-contained and shall include a table of contents.

(2) The GHANA AIP shall not duplicate information within itself or from other sources.

(3) The Ghana AIP shall be published in loose-leaf form unless the complete publication is reissued at frequent intervals.

(4) The Ghana AIP shall be dated. In the case of AIP issued in loose-leaf form, each page 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.

(5) A checklist giving the current date of each page in the Ghana AIP 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.

(6) The Ghana AIP issued as a bound volume and each page of an Ghana AIP issued in loose-leaf form shall be so annotated as to indicate clearly:

(a) the identity of the Ghana AIP;

(b) the territory covered and subdivisions when necessary;

(c) the identification of the Republic of Ghana and the Ghana Civil Aviation Authority;

(d) page numbers/chart titles;

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

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

(8) The AIS Section shall establish a procedure for Amendment of the Ghana AIP to ensure that the data or information received to be published are deemed significant and meeting specifications in 15.4.

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

(10) GHANA 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.

(11) The regular interval referred to in 15.4.2(9) shall be specified in the GHANA AIP, Part 1 — General (GEN).

15.4.3 SPECIFICATIONS FOR GHANA AIP AMENDMENTS

(1) The AIS Section shall ensure that permanent changes to the GHANA AIP are published as Ghana AIP Amendments.

(2) GHANA AIP Amendment shall be allocated a serial number, which shall be consecutive.

(3) GHANA AIP Amendment page, including the cover sheet, shall display a publication date. When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet.

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

(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.

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

(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 15.5.2.13.3.

15.4.4 SPECIFICATIONS FOR AIP SUPPLEMENTS

(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 Ghana AIP Supplements.

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

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

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

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

(6) 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 15.5.2.13.3.

(7) AIP Supplement pages shall be coloured in order to be conspicuous, preferably in yellow.

(8) AIP Supplement pages shall be kept as the first item in the AIP parts.

15.4.5 DISTRIBUTION

The AIS Section shall make available by the most expeditious means, the Ghana AIP, Ghana AIP Amendments and Ghana AIP Supplements.

15.4.6 ELECTRONIC AIP (eAIP)

(1) The AIS Section shall publish the Ghana AIP, Ghana AIP Amendment, Ghana AIP Supplement and Ghana AIC in a format that allows for displaying on a computer screen and printing on paper.

(2) The AIS Section shall, where it desires to publish an eAIP, ensure that the information content of the eAIP and the structure of chapters, sections and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.

(3) The AIS Section shall pursuant to 15.4.6.2 make available the eAIP on a physical distribution medium (CD, DVD, etc.) or online.

15.5 NOTAM

15.5.1 ORIGINATION

(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 1.— Operationally significant changes concerning circumstances listed in IS: 15.6.1.1, Part 1, are issued under the Aeronautical Information Regulation and Control (AIRAC) system specified in Chapter 6.

Note 2.— Information of short duration containing extensive text and/or graphics is published as an AIP Supplement (see Subpart 15.4).

(2) 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, withdrawal and electronic and significant changes in operational capability of radio navigation and air-ground communication services. This includes: interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation, and air-ground communication services;

(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 Directives 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 take- off/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 21.5 MHz is required;

(p) allocation, cancellation or change of location indicators;

(q) significant changes in the level of protection normally available at an aerodrome or heliport 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 (see Subpart 9 of Part 14).

(r) presence or removal of, or significant changes in, hazardous conditions due to radioactive material, toxic chemicals 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.

Note.— See subpart 24.2.32.1 of Part 24

(3) The AIS Section shall take into consideration any other circumstance which may affect the operations of aircraft in originating a NOTAM.

(4) The AIS Section shall not originate a NOTAM in respect of the following information :

(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 or heliports that do not affect the safe operation of aircraft;

(d) partial failure of aerodrome or heliport lighting facilities where such failure does not directly affect aircraft operations;

(e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative;

(f) the lack of apron marshalling services and road traffic control;

(g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;

(h) parachuting when in uncontrolled airspace under VFR (see 15.5.1(1)), when controlled, at promulgated sites or within danger or prohibited areas;

(i) other information of a similar temporary nature.

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

(6) Notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace shall be given to the AIS Section as soon as possible.

(7) The AIS Section shall ensure that 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.

(8) The AIS Section shall ensure that when an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a 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 and time as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.

15.5.2 GENERAL SPECIFICATIONS

(1) Except as otherwise provided in 15.5.2(3) and 15.5.2(4), the AIS Section shall ensure that each NOTAM shall contain the information in the order shown in the NOTAM Format in IS:15.5.2(1).

(2) The 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.

(3) When NOTAM are selected for international distribution, English text shall be included for those parts expressed in plain language.

(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 IS: 15.5.2(3).

(5) The AIS Section, when originating a NOTAM, 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.

(6) When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued by the AIS Section.

(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.

(8) Each NOTAM shall deal with only one subject and one condition of the subject.

(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.

(10) Each NOTAM shall be transmitted as a single telecommunication message.

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

(12) The AIS Section shall ensure that location indicators included in the text of a NOTAM shall be those contained in *Location Indicators* (Doc 7910).

(13) In no case shall a curtailed form of such indicators be used.

(14) Where no ICAO location indicator is assigned to the location, its place name spelt in accordance with 15.1.3(2) shall be entered in plain language.

(15) The AIS Section shall issue a checklist of valid NOTAM as a NOTAM over the Aeronautical Fixed Service (AFS) at intervals of not more than one month using the NOTAM Format specified in I.S: 15.5.2(1). One NOTAM shall be issued for each series.

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

(17) 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.

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

15.5.3 DISTRIBUTION

(1) NOTAM shall be distributed on the basis of a request.

(2) The AIS Section shall prepare NOTAM in conformity with the relevant provisions of the ICAO communication procedures.

(3) The AIS Section shall employ the AFS for NOTAM distribution, whenever practicable.

(4) The AIS Section shall use, preceding the text, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator, when a NOTAM exchanged as specified in 15.5.3(4) is sent by means other than the AFS, the Authority shall select the NOTAM that are to be given international distribution.

(5) Selective distribution lists shall be used, where practicable.

(6) International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices concerned.

(7) 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.

(8) A predetermined distribution system for NOTAM transmitted on the AFS in accordance with IS: 15.5.3.4.2 shall be used whenever possible, subject to the requirements of 15.5.3.4.

15.6 AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)

15.6.1 GENERAL SPECIFICATIONS

(1) The AIS Section shall ensure that information concerning the circumstances listed in IS: 15.6.1.1, 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. 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.

(2) The regulated system (AIRAC) shall also be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the circumstances listed in IS: 15.6.1.1, Part 2.

(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.

(4) The AIS Section shall ensure that implementation dates other than AIRAC effective dates shall not be used for pre- planned operationally significant changes requiring cartographic work and or for updating of navigation databases.

(5) The AIS Section shall avoid the use of the date in the AIRAC cycle which occurs between 21 December and 17 January inclusive as an effective date for the introduction of significant changes under the AIRAC system.

15.6.2 PROVISION OF INFORMATION IN PAPER COPY FORM

(1) The AIS Section shall publish information provided under the AIRAC system paper copy form and shall distribute them 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.

(2) Whenever major changes are planned and where advance notice is desirable and practicable, information provided in paper copy form shall be distributed by the AIS Section at least 56 days in advance of the effective date. This shall be applied to the establishment of, and premeditated major changes in, the circumstances listed in IS: 15.6.1.1, Part 3, and other major changes if deemed necessary.

15.6.3 PROVISION OF INFORMATION AS ELECTRONIC MEDIA

(1) Where an aeronautical database is established, the Authority shall, when updating its contents concerning the circumstances listed in IS: 15.6.1.1, Part 1, ensure that the effective dates of data coincide with the established AIRAC effective dates.

(2) Information provided as electronic media concerning the circumstances listed in IS: 15.6.1.1, Part 1, shall be distributed/made available by the Authority so as to reach recipients at least 28 days in advance of the AIRAC effective date.

(3) Whenever major changes are planned and where advance notice is desirable and practicable, information provided as electronic media shall be distributed or made available at least 56 days in advance of the effective date. This shall be applied to the establishment of, and premeditated major changes in, the circumstances listed in IS: 15.6.1.1, Part 3, and other major changes if deemed necessary.

15.7 AERONAUTICAL INFORMATION CIRCULARS (AIC)

15.7.1 ORIGINATION

(1) The AIS Section shall ensure that:

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

(a) under the specifications in 15.4.1 for inclusion in an AIP; or

(b) under the specifications in 15.5.1 for the origination of a NOTAM.

(c) An AIC shall be originated whenever it is desirable to promulgate:

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

(d) This shall include:

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

(b) forecasts of implementation of new navigational systems;

(c) significant information arising from aircraft accident or incident investigation which has a bearing on flight safety;

(d) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;

(e) advice on medical matters of special interest to pilots;

(f) warnings to pilots concerning the avoidance of physical hazards;

(g) effect of certain weather phenomena on aircraft operations;

(h) information on new hazards affecting aircraft handling techniques;

(i) Directives relating to the carriage of restricted articles by air;

(j) reference to the requirements of, and publication of changes in, national legislation;

(k) aircrew licensing arrangements;

(l) training of aviation personnel;

(m) application of, or exemption from, requirements in national legislation;

(n) advice on the use and maintenance of specific types of equipment;

(o) actual or planned availability of new or revised editions of aeronautical charts;

(p) carriage of communication equipment;

(q) explanatory information relating to noise abatement;

(r) selected airworthiness directives;

(s) changes in NOTAM series or distribution, new editions of AIP or major changes in their contents, coverage or format;

(t) other information of a similar nature.

(3) The publication of an AIC shall not remove the obligations set forth in Subparts 15.4 and 15.5.

15.7.2 GENERAL SPECIFICATIONS

(1) The Authority shall select the AIC that are to be given international distribution.

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

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

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

15.7.3 DISTRIBUTION

The Authority shall give AIC selected for international distribution the same distribution as for the AIP.

15.8 PRE-FLIGHT AND POST-FLIGHT INFORMATION

15.8.1 PRE-FLIGHT INFORMATION

(1) The AIS Section shall at any aerodrome or heliport normally used for international air operations, make available aeronautical information essential for the safety, regularity and efficiency of air navigation and relative to the route stages originating at the aerodrome or heliport to flight operations personnel, including flight crews and services responsible for pre-flight information.

(2) The AIS Section shall ensure that Aeronautical information provided for pre-flight planning purposes at the aerodromes or heliports referred to in 15.8.1.1 shall include relevant:

(a) elements of the Integrated Aeronautical Information Package;

(b) maps and charts.

(3) 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 water on runways and taxiways, including their effect on surface friction;

(d) parked aircraft or other objects on or immediately adjacent to taxiways;

(e) presence of other temporary hazards;

(f) presence of birds constituting a potential hazard to aircraft operations;

(g) failure or irregular operation of part or all of the aerodrome lighting system including approach, threshold, runway, taxiway, obstruction and manoeuvring area unserviceability lights and aerodrome power supply;

(h) failure, irregular operation and changes in the operational status of

SSR, ADS-B, ADS-C, CPDLC, D-ATIS, D-VOLMET, Radio Navigation Services, VHF aeromobile channels, RVR observing system, and secondary power supply; and

(i) presence and operation of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with any associated procedures and or limitations applied thereof.

(4) The AIS Section shall ensure that a recapitulation of valid NOTAM of operational significance and other information of urgent character shall be made available to flight crews in the form of plain-language pre-flight information bulletins (PIB).

15.8.2 AUTOMATED PRE-FLIGHT INFORMATION SYSTEMS

(1) The Authority shall provide automated pre-flight information systems to the AIS Section which shall ensure that aeronautical data and aeronautical information is made available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes. The aeronautical data and aeronautical information made available shall comply with the provisions of 15.8.1.2 and 15.8.1.3.

(2) The Authority shall ensure that 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 or machine interface of such facilities shall ensure easy access in a guided manner to all relevant information or data.

(3) The Authority shall ensure that Automated pre-flight information systems for the supply of aeronautical information and aeronautical data for self-briefing, flight planning and flight information service shall:

(a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical 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 data and aeronautical information accessed, as required;

(d) use access and interrogation procedures based on abbreviated plain

language and ICAO location indicators, as appropriate, or based on a menu- driven user interface or other appropriate mechanism as agreed between the Authority and operator concerned; and

(e) provide for rapid response to a user request for information.

(4) 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 15.8.2.1 and meteorological information in accordance with 20.9.4.1 of Part 20 of Ghana Civil Aviation (ANS) Directives, shall be established by an agreement between the Authority and the Ghana Meteorological Agency.

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

Note.— The Ghana Meteorological Agency remains responsible for the quality of the meteorological information provided by means of such a system in accordance with 20.9.4.3 of Part 20 of Ghana Civil Aviation (ANS) Directives.

15.8.3 POST-FLIGHT INFORMATION

(1) The Authority shall ensure that arrangements are made to receive at aerodromes or heliports information concerning the state and operation of air navigation facilities noted by aircrews and shall ensure that such information is made available to the AIS Section for such distribution as the circumstances necessitate.

(2) The Authority shall ensure that arrangements are made to receive at aerodromes or heliports information concerning the presence of birds observed by aircrews and shall ensure that such information is made available to the AIS Section for such distribution as the circumstances necessitate.

Note.— See Subpart 14.9.4 of Part 14, of Ghana Civil Aviation (Aerodrome) Directives.

15.9 TELECOMMUNICATION REQUIREMENTS

(1) The Authority shall ensure that the International NOTAM office shall be connected to the aeronautical fixed service (AFS).

(2) The connections shall provide for printed communications.

(3) The international NOTAM office shall be connected, through the AFS, to the following points within the Accra FIR:

(a) area control centres and flight information centres;

(b) aerodromes or heliports at which an information service is established in accordance with 15.8.

(4) Subject to availability, satisfactory operation and bilateral or multilateral and or regional air navigation agreement, the use of the public Internet shall be permitted for exchange of non-time-critical types of aeronautical information.

15.10 ELECTRONIC TERRAIN AND OBSTACLE DATA

15.10.1 FUNCTIONS

(1) Sets of Electronic terrain and obstacle data intended to be 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 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; and

(g) aeronautical chart production and on-board databases.

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

pose a hazard to air navigation.

15.10.2 COVERAGE AREAS AND REQUIREMENTS FOR DATA PROVISION

(1) The coverage areas for sets of electronic terrain and obstacle data shall be specified as:

(a) Area 1: entire territory of Ghana;

(b) Area 2: within the vicinity of an aerodrome, subdivided as follows:

(c) Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists;

Note.— See Subpart 14.3 of Part 14 of the Ghana Civil Aviation (Aerodrome) Directives for dimensions for runway strip.

(d) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;

(e) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and

(f) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing terminal control area (TMA) boundary, whichever is nearest;

(g) Area 3: the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway centre line and 50 m from the edge of all other parts of the aerodrome movement area; and

(h) Area 4: The area extending 900 m prior to the runway threshold and 60 m each side of the extended runway centre line in the direction of the approach on a precision approach runway, Category II or III.

Note.— See IS: 15.10.2 for descriptions and graphical illustrations of the coverage areas.

(2) Electronic terrain data shall be provided for Area 1. The obstacle data shall be provided for obstacles in Area 1 higher than 100 m above ground.

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

(4) At aerodromes regularly used by international civil aviation, electronic terrain data shall be provided for:

(a) Area 2a;

(b) the take-off flight path area; and

(c) an area bounded by the lateral extent of the aerodrome obstacle limitation surfaces.

(5) From 12 November 2015, at aerodromes regularly used by international civil aviation, electronic obstacle data shall be provided for:

(a) Area 2a for those obstacles that penetrate the relevant obstacle data collection surface specified in IS: 15.10.2;

(b) objects in the take-off flight path area which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area; and

(c) penetrations of the aerodrome obstacle limitation surfaces.

Note.— Take-off flight path areas are specified in Subpart 21.3.8.2 of Part 21. Aerodrome obstacle limitation surfaces are specified in Subpart 14.4 of Part 14 of Ghana Civil Aviation (Aerodrome) Directives.

(6) At aerodromes regularly used by international civil aviation, electronic terrain and obstacle data shall be provided for Area 4 for terrain and obstacles that penetrate the relevant obstacle data collection surface specified in IS:15.10.2, for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.

Note.— Area 4 terrain data and Area 2 obstacle data are normally sufficient to support the production of the Precision Approach Terrain Chart — ICAO. When more detailed obstacle data are required for Area 4, these may be provided in accordance with the Area 4 obstacle data requirements specified in IS: 15.10.2, Table A8-2. Guidance material on accordance with the Area 4 obstacle data requirements specified in IS: 15.10.2, Table A8-2

15.10.3 TERRAIN DATA SET — CONTENT, NUMERICAL SPECIFICATION AND STRUCTURE

(1) A terrain data set 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.

(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 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".

(3) In terrain data sets, only one feature type, i.e. terrain, shall be provided. Feature attributes describing terrain shall be those listed in IS: 15.10.2, 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 data set.

(4) Electronic terrain data for each area shall conform to the applicable numerical requirements in 15.10.2, Table A8-1.

15.10.4 OBSTACLE DATA SET— CONTENT, NUMERICAL SPECIFICATION AND STRUCTURE

(1) Obstacles shall not be included in terrain data sets. Obstacle data elements are features that shall be represented in the data sets by points, lines or polygons.

(2) Obstacle data shall comprise the digital representation of the vertical and horizontal extent of the obstacle.

(3) In an obstacle data set, all defined obstacle feature types shall be provided and each of them shall be described according to the list of mandatory attributes provided in IS:15.10.2, Table A8-4.

Note.— By definition, obstacles can be fixed (permanent or temporary) or mobile. Specific attributes associated with mobile (feature operations) and temporary types of obstacles are annotated in IS: 15.10.2, Table A8-4, as optional attributes. If these types of obstacles are to be provided in the data set, appropriate attributes describing such obstacles are also required.

(4) Electronic obstacle data for each area shall conform to the applicable numerical requirements in IS: 15.10.2, Table A8-2.

15.10.5 TERRAIN AND OBSTACLE DATA PRODUCT SPECIFICATIONS

(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.

(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).

(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.

(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.

(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.

(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.

(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.

(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.

(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.

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

(a) Areas 2a, 2b, 2c, 2d;

(b) the take-off flight path area; and

(c) the obstacle limitation surfaces.

15.11 AERODROME MAPPING DATA

15.11.1 FUNCTIONS

(1) Aerodrome mapping data includes aerodrome geographic information that supports applications which improve the user's situational awareness or supplements surface navigation, thereby increasing safety margins and operational efficiency. Aerodrome mapping data sets with appropriate data element

accuracy support requirements for collaborative decision making, common situational awareness, and aerodrome guidance applications are intended to be used, among others, in the following air navigation applications:

(a) position and route awareness including moving maps with own ship position, surface guidance and navigation (such as advanced surface movement guidance and control system);

(b) traffic awareness including surveillance and runway incursion detection and alerting;

(c) facilitation of aerodrome-related aeronautical information, including NOTAM;

(d) resource and aerodrome facility management; and

(e) aeronautical chart production.

(2) The data may also be used in other applications such as flight simulator and synthetic vision systems.

15.11.2 AERODROME MAPPING DATA — REQUIREMENTS FOR PROVISION

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

Note 1.— Accuracy and integrity requirements for aerodrome mapping data are contained in Appendix 5 of Part 14 of the Ghana Civil Aviation (Aerodrome) Directives.

15.11.3 AERODROME MAPPING DATA PRODUCT SPECIFICATION

(1) The ISO 19100 series of standards for geographic information shall be used as a reference framework by the Authority.

(2) Aerodrome mapping data products shall be described following the ISO 19131 data product specification standard.

15.11.4 AERODROME MAPPING DATABASE — DATA SET CONTENT AND STRUCTURE

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

(2) Aerodrome mapping data sets shall contain aerodrome mapping data consisting of aerodrome features.

(3) Aerodrome mapping metadata shall comply with ISO 19115.

15.12 ADDITIONAL REQUIREMENTS FOR AIS

15.12.1 MANAGEMENT

(1) The AIS Section shall have a documented organizational structure clearly defining lines of accountability of personnel with respect to the provision of services in accordance with ICAO requirements.

(2) The AIS Section shall have a documented organizational structure showing the relationship between operational units.

(3) The AIS Section shall have the functions, duties and responsibilities of its management staff clearly defined and documented.

(4) The AIS Section shall ensure that management positions are filled with personnel who are appropriately qualified to perform the required functions.

(5) The AIS Section shall have adequate personnel to plan, perform, supervise and provide the required services to ensure aviation safety at all times.

(6) The AIS Section shall ensure that a system of supervision for all tasks performed shall be established, with clear descriptions of supervisory functions and supervisors adequately trained to effectively perform these functions.

(7) The AIS Section shall ensure procedures for control, analysis and storage of records, documents and safety related data shall be documented.

(8) The AIS Section shall have job descriptions for operations and training personnel clearly defined and documented and a system of personal files containing all relevant information of persons under training, OJT instructors and leave records shall be maintained.

(9) The AIS Section shall have a procedure in place for taking remedial action following an error or offence done by an officer on duty.

(10) The AIS Section shall establish a system of communication in the following form:

(a) Circulars,

(b) Orders and,

(c) Log entries.

(11) The AIS Section shall conduct regular operational meetings. Minutes of the meetings shall be kept and follow up done on matters arising from the meetings.

(12) The AIS Section shall supply monthly serviceability reports and statistics on AFTN/AMHS and other facilities and equipment to the Head of the Department.

15.12.2 PERSONNEL REQUIREMENTS

(1) The Authority shall ensure that the AIS Section is staffed with appropriately skilled personnel to ensure the provision of aeronautical information service in a safe, efficient, continuous and sustainable manner. In this context, they shall establish policies for the recruitment and training of personnel.

(2) The Authority shall employ, contract, or otherwise engage:

(a) a senior person or persons responsible to the head of the AIS Section for ensuring that all activities undertaken by the AIS Section are in compliance with these requirements and those prescribed by the Ghana Civil Aviation Directives, and who shall have unrestricted access to work performed or activities undertaken by all other persons as employees of, and other persons rendering services for and on behalf of the AIS Section.

(b) Sufficient personnel to Promulgate and maintain the facilities listed in the Operations Manual.

(3) The AIS Section shall ensure that its personnel are competent and are of sufficient numbers and have been provided with written evidence of the scope of their authorization to be able to discharge their allocated responsibilities. The job description should depict the job purpose, key responsibilities, and outcome to be achieved of each staff.

(4) The Authority shall have a documented methodology for determining the number of staff required to work efficiently for each unit.

(5) The AIS Section shall establish procedures for personnel, who are authorized to place into operational service any of the facilities listed in their Operations Manual, to:

(a) Assess the competence of those authorized personnel;

(b) Maintain the competence of those authorized personnel; and

(c) Establish a means to provide those personnel with written evidence of the scope of their authorization.

15.12.3 OPERATIONS MANUAL

(1) The AIS Section shall develop and keep up-to-date operations manual relating to the provision of their services for the use and guidance of operations personnel.

(2) The contents of the operations manual shall include but not be limited to the following:

(a) a table of contents based on the items in the manual, indicating the page number on which each item begins;

(b) a description of the organizational structure and a statement setting out the functions that the AIS Section performs, or proposes to perform;

(c) a description of the chain of command established and a statement of the duties and responsibilities of any supervisory positions within the organizational structure;

(d) a statement showing how the AIS Section determines the number of operational staff required including the number of operational supervisory staff;

(e) a statement of the responsibilities and functions for each position;

(f) a description of the AIS Section's record keeping system;

(g) a description of the processes and documentation used to provide operational instructions to staff;

(h) a description of the procedures to be followed to ensure all operational staff are familiar with any operational changes that have been issued since they last performed operational duties;

(i) a description of the procedures to be used in commissioning new facilities, equipment and services;

(j) the procedures to be followed for revising the operations manual.

(3) The AIS Section shall ensure that:

(a) operations manuals contain the instructions and information required by the operations personnel to perform their duties;

(b) relevant parts of the operations manuals are accessible to the personnel concerned;

(c) the operations personnel are expeditiously informed of amendments to the operations manual applying to their duties as well as of their entry into force.

(d) the initial copy of the manual shall be submitted to the Authority both in hard and soft copies for review and approval.

15.12.4 TRAINING

(1) The Authority shall:

(a) Ensure that all its AIS personnel possess the skills and competencies required in the provision of the Aeronautical Information Services.

(b) Develop an AIS Training Manual, which shall contain the overall training policy and program for its AIS personnel, which include the details of the training courses that different levels of technical staff have to undergo to perform their duties. This shall include Basic, Advanced, Specialized, Recurrent training, On-the-job-training and Human factor initial and recurrent training, where applicable in accordance with ICAO Training Manual for AIS or any such training program, which is acceptable to the Authority.

(c) Maintain individual training records for each of its AIS staff, which should include a training plan detailing the courses completed by each staff as well as the time frame for attending future courses as required under this training plan.

(2) The Authority shall ensure that the AIS Section trains personnel dedicated to OJT.

(3) The Authority shall ensure the implementation of its training policy and programme for its technical staff.

(4) Training for AIS technical personnel shall be as prescribed in Doc 7192, Part E-3 (ICAO AIS Training manual).

(5) The head of the AIS Section shall maintain training files for the operational staff.

15.12.5 AERONAUTICAL INFORMATION FACILITY REQUIREMENTS

The AIS Section shall establish a procedure in its Operations Manual to ensure that each Aeronautical Information Service facility:

(a) Is designed, installed, and commissioned to meet the applicable operational specification for that facility

(a) Conforms with the applicable system characteristics and specification standards prescribed in the Ghana Civil Aviation Directives and relevant ICAO Documents;

(b) Is installed with suitable power supplies and means to ensure continuity of services.

15.12.6 DOCUMENTATION

(1) The Aeronautical Information Service Section shall:

(a) Document the format and standards for the aeronautical information published under the authority of the mandate of the Director-General;

(b) Ensure that the format and standards take into account the circumstances under which the information will be used;

(c) Hold copies of relevant reference materials, standards, practices and procedures, and any other documentation that is necessary for the aeronautical information service listed in their Operations Manual.

(2) These documents shall include, but not be limited to:

(a) Applicable Ghana Civil Aviation Directives,

(b) ANNEX 4 – Aeronautical Charts,

(c) ANNEX 15 – Aeronautical Information Services

(d) ICAO Doc 9839 – Manual on the Quality Management System for Aeronautical Information Services

(e) ICAO Doc 7383 – Aeronautical Information Services provided by States

(f) ICAO Doc 7910 – ICAO Location Indicators

(g) ICAO Doc 8126 – Aeronautical Information Services Manual

(h) ICAO Doc 8400 – ICAO Abbreviations and Codes

(i) ICAO Doc 8585 – Designators for Aircraft Operating Agencies

(j) ICAO Doc 8697 – Charting Manual

(k) ICAO Doc 9377 – Manual on Coordination between Air Traffic Service, Aeronautical Information Services and Aeronautical Meteorological Services

(l) ICAO Doc 9674 – World Geodetic System – 1984 (WGS – 84) Manual

(m) ICAO Doc 9683 – Human Factors Training Manual

(3) All documents developed by the AIS Section shall be reviewed and approved by the Authority.

15.12.7 **AIS OPERATIONS LOGBOOK**

(1) The AIS Section shall establish procedures in its Operations Manual to ensure that a logbook, with sequentially numbered pages, is kept at each office and where an office has physically separate operation areas, at each of such location within the office.

(2) The procedure shall ensure that:

(a) The logbook is maintained by the senior person, or the person on duty at a nominated operating position;

(b) the logbook is maintained throughout the operating hours of the office;

(c) all entries include the date, time of entry and signature;

(d) Every page of the logbook must be signed by the Shift manager or a designated senior person;

(e) Logbook entries are:

(i) In chronological sequence and in ink;

(ii) Without erasure, defacement, or obliteration; and

(iii) Corrected by drawing a single line through the erroneous information and initialing the correction.

(f) Actual times of opening and closing of the office are recorded in the logbook, together with the reason for every variation from published hours of service; and

(g) Logbooks are retained for a period of not less than two (2) years from the date of final entry to serve as a source of Archiving for future referencing.

15.12.8 **PREVENTION OF FATIGUE**

(1) The AIS Section shall establish procedures to ensure that AIS Personnel are not subject to fatigue in that:

(a) There is a minimum of 12 consecutive hours rest period between shifts and minimum of 24 hours after night shifts.

(b) At any time a minimum of two (2) personnel shall be present in a shift;

(c) Except in an emergency, AIS Personnel shall refrain from performing any duties for at least 24 consecutive hours at least once during each 7 consecutive days.

(2) The AIS Section shall establish a five (5) Group shift system.

15.12.9 **SHIFT ADMINISTRATION**

The AIS Section shall establish a procedure to ensure that:

(a) Adequate time is provided at the beginning and end of each shift, for the performance of those duties required:

(b) Before start of the shift; and after the end of the shift.

(c) A minimum of 30 minutes is provided for each transfer of duties. This shall be done to ensure all briefings to the incoming team have been done well and all handovers of both documentation and other related things such as cash in the briefing office is well handed over.

15.12.10 USE OF UNAUTHORISED DRUGS

The AIS Section shall establish procedures to ensure that no AIS personnel whose function is critical to the safety of aviation shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired and that they shall not engage in any unauthorized use of such substances.

15.12.11 COORDINATION

The AIS Section shall establish systems and procedures in its Operations Manual to ensure where applicable, co-ordination with the following:

(a) The Air Traffic Control Section
(b) The Search and Rescue Unit;

(c) National Security Agencies;

(d) Agencies responsible for Search And Rescue;

(e) The Aeronautical Telecommunication Service Section;

(f) Airport and aerodrome operators;

(g) Ghana Meteorological Agency.

15.12.12 RECORDS

(1) The AIS Section shall establish procedures to identify, collect, index, store, maintain and dispose of the records that are necessary for the Aeronautical Information Service listed in their Operations Manual.

(2) Procedures shall ensure that:
(a) There are records enabling all incoming and outgoing aeronautical information to be readily identified and that supplementary information can be similarly identified, verified and where necessary, authenticated;

(b) There is a record of each person who is authorized by the AIS Section to check, edit and publish aeronautical information;

(c) There is a record of each occurrence of error correction under the procedure;

(d) There is a record of each internal quality assurance review of the AIS Section carried out under the procedure;

(e) There is a record of all audits and reviews required under the Quality management procedure;

(f) All records are legible and of a permanent nature; and

(g) All records are retained for at least 5 years except NOTAM, AIP Supplements and Aeronautical Information Circulars, which need only to be retained for 31 days after cancellation.

15.12.13 **SAFETY MANAGEMENT SYSTEM (SMS)**

(1) The Aeronautical Information Service Section shall establish a Safety Management System in accordance with Part 36 of Ghana Civil Aviation (SMS) Directives.

(2) The safety management system shall include:

(a) Hazard identification;
(b) Risk management;
(c) Safety assurance;
(d) Safety performance monitoring, auditing and measurement;
(e) Change management; and
(f) Management Reviews.

(3) The AIS Section shall develop procedures for managing safety when introducing new functional systems or changing the existing functional systems.

(4) The AIS Section shall notify the Authority of all planned safety related changes where the changes may impact on the safety of an air traffic service.

15.12.14 **CONTINGENCY PLAN**

(1) The AIS Section shall have in place contingency plans for all the services they provide in the case of events which result in significant degradation or interruption of their operations.

(2) Interruption of operations refers to a major event which impacts on the AIS Section's ability to continue to provide a safe service such as a major ATS equipment failure, serious aircraft incident, terrorist incident, fire, bomb threat, pandemic influenza, major IT failures etc. Such situations would normally be considered as part of a business continuity plan requiring specific contingency plans to be drawn up as mitigation.

(3) Emergency procedures shall detail the responsibilities and accountabilities of all personnel involved.

(4) Procedures shall be established for events that cause operational deficiencies to arise whereby the facilities promulgated in the Ghana AIP are temporarily not available.

15.12.15 **SECURITY MANAGEMENT SYSTEM**

(1) The AIS Section shall establish a security management system to ensure:

(a) the security of their facilities and personnel so as to prevent unlawful interference with the provision of aeronautical information service;

(b) the security of operational data they receive or produce or otherwise employ, so that access to it is restricted only to those authorized.

(2) The security management system shall define:

(a) the procedures relating to security risk assessment and mitigation, security monitoring and improvement, security reviews and lesson dissemination;

(b) the means designed to detect security breaches and to alert personnel with appropriate security warnings;

(c) the means of containing the effects of security breaches and to identify recovery action and mitigation procedures to prevent reoccurrence.

(3) The AIS Section shall ensure the security clearance of their

personnel and coordinate with the relevant civil and military authorities to ensure the security of their facilities, personnel and data.