GUYANA

No. of 2016

REGULATIONS Made Under

CIVIL AVIATION ACT (Cap. 53:01)

IN EXERCISE OF THE POWERS CONFERRED UPON ME BY SECTION 37 OF THE CIVIL AVIATION ACT, CAP. 53:01, I MAKE THE FOLLOWING REGULATIONS:-

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PART I PRELIMINARY

| Citation. | 1. These Regulations may be cited as the Civil Aviation (Air Navigation Services) Regulations 2016. |
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| Interpretation. | 2. (1) In these Regulations – |
| Cap. 53:01 | "Act" means the Civil Aviation Act; |
| | "accepting ATC unit" means an air traffic control unit next to take control of an aircraft; |

"accident" means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which —

- (a) a person is fatally or seriously injured as a result of—
 - (i) being in the aircraft; or
 - (ii) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or
 - (iii) direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted other by persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- (b) the aircraft sustains damage or structural failure which—
 - (i) adversely affects the structural strength, performance or flight characteristics of the aircraft; and
 - (ii) would normally require major repair or replacement of the affected component, except for engine failure

or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or

(c) the aircraft is missing or is completely inaccessible;

"accuracy" means a degree of conformance between the estimated or measured value and the true value;

"ADS" means a surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, fourdimensional position and additional data, as appropriate;

"ADS-C" is a means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports;

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

"ADS-C agreement" means a reporting plan which establishes the conditions of ADS-C data reporting such that data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services; Note: The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

"ADS-B" is a means by which aircraft, aerodrome vehicles and other objects can automatically transmit or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link;

"advisory airspace" means an airspace of defined dimensions, or designated route, within which air traffic advisory service is available;

"advisory route" means a designated route along which air traffic advisory service is available;

"aerodrome" means 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 control service" means an air traffic control service for aerodrome traffic;

"aerodrome elevation" means the elevation of the highest point of the landing area;

"aerodrome control tower" means a unit established to provide air traffic control service to aerodrome traffic;

"aerodrome operating minima" means the limits of usability of an aerodrome for—

(i) take-off, expressed in terms of runway visual range or visibility

and, if necessary, cloud conditions;

- (ii) landing in precision approach and landing operations, expressed in terms of visibility or runway visual range and decision altitude or height as appropriate to the category of the operation;
- (iii) landing in approach and landing operations with vertical guidance, expressed in terms of visibility or runway visual range and decision altitude or height; and
- (iv) landing in non-precision approach and landing operations, expressed in terms of visibility or runway visual range, minimum descent altitude or height and, if necessary, cloud conditions;

"aerodrome reference point" means the designated geographical location of an aerodrome;

"aerodrome traffic" means all traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome;

"aerodrome traffic zone" means an airspace of defined dimension established around an aerodrome for the protection of aerodrome traffic;

"aeronautical chart" means a representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation; "aeronautical data" means a representation of aeronautical facts, concepts or instructions in a formalised manner suitable for communication, interpretation or processing;

"aeronautical fixed service" means a telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services;

"aeronautical information" means information resulting from the assembly, analysis and formatting of aeronautical data;

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

"Aeronautical Information Publication" means 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 publication amendment" means permanent changes to the information contained in the AIP;

"aeronautical information regulation and control" means a system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices;

"Aeronautical Information Service" means a service established within the defined area of coverage responsible for the provision of aeronautical information or data necessary for the safety, regularity and efficiency of air navigation;

"aeronautical information service product" means aeronautical information provided in the form of the elements of the Integrated Aeronautical Information Package except NOTAM and pre-flight information bulletin PIB, including aeronautical charts, or in the form of suitable electronic media;

"aeronautical mobile service" means a mobile communication service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency positionindicating radio beacon stations may also participate in this service on designated distress and emergency frequencies;

"aeronautical station" means a station in the aeronautical mobile service located on land, on board a ship or on a platform at sea;

"aeronautical telecommunication station" means a station in the aeronautical telecommunication service;

"aircraft stand" means a designated area on an apron intended to be used for parking an aircraft;

"AIP Supplement" means temporary changes to the information contained in the AIP which are published by means of special pages;

"air defence identification zone" means special designated airspace of defined dimensions within which aircraft are required to comply with special identification or reporting procedures additional to those related to the provision of ATS;

"airborne collision avoidance system" means an aircraft system based on SSR transponder signals which operates independently of ground based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders;

"aircraft" means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface;

"air-ground communication" means two-way communication between aircraft and stations or locations on the surface of the earth;

"AIRMET information" means information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof;

"air-taxiing" means movement of a helicopter VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than thirty-seven kilometres (37 km) per hour or twenty (20) knots;

"air traffic" means all aircraft in flight or operating on the manoeuvring area of an aerodrome;

"air traffic advisory service" means a service provided within advisory

airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans;

"air traffic control clearance" means authorisation for an aircraft to proceed under conditions specified by an air traffic control unit;

"air traffic control service" means a service provided for the purpose of —

- (a) preventing collisions;
 - (i) between aircraft and
 - (ii) on the manoeuvring area between aircraft and obstructions; and
- (b) expediting and maintaining an orderly flow of air traffic;

"air traffic control unit" includes an area control centre, approach control unit or aerodrome control tower;

"air traffic flow management" means a service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilised to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority;

"air traffic service" includes a flight information service, alerting service, air traffic advisory service, air traffic control service which may include area control service, approach control service or aerodrome control service;

"air traffic services airspaces" means airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which ATS and rules of operation are specified;

"air traffic services reporting office" means a unit established for the purpose of receiving reports concerning ATS and flight plans submitted before departure;

"air traffic service route" means a specified route designed for channelling the flow of traffic as necessary for the provision of ATS;

"air traffic services unit" includes an air traffic control unit, flight information centre or air traffic services reporting office;

"air transit route" means a defined route for the air transiting of helicopters;

"airway" means a control area or portion thereof established in the form of a corridor;

"ALERFA" means the code word used to designate an alert phase;

"alerting service" means a service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required;

"alert phase" means a situation wherein apprehension exists as to the safety of an aircraft and its occupants;

"alternate aerodrome" means an aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing which includes the following:

- (i) "take-off alternate" means an alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure;
- (ii) "en route alternate" means an aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route;
- (iii) "ETOPS en route alternate" means a suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shut down or other abnormal or emergency condition while en route in an ETOPS operation; and
- (iv) "destination alternate" means an alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing;

"altitude" means the vertical distance of a level, a point or an object considered as a point, measured from mean sea level;

"AMA" means the minimum altitude to be used under instrument meteorological conditions IMC that provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians.

"approach control service" means air traffic control service for arriving or departing controlled flights; "approach control unit" means a unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes;

"appropriate authority" means -

- (i) the relevant authority of the State of Registry in relation to flight over the high seas;
- (ii) the relevant authority of the State having sovereignty over the territory being overflown in relation to flight other than over the high seas;

"appropriate air traffic services authority" means the relevant authority designated by the State responsible for providing ATS in the airspace concerned;

"apron" means a defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance;

"apron management service" means a service provided to regulate the activities and the movement of aircraft and vehicles on an apron;

"area control centre" means a unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction;

"area control service" means air traffic control service for controlled flights in control areas;

"area minimum altitude" means the lowest altitude to be used under IMC that will provide a minimum vertical clearance of three thousand metres (3,000 m) or one thousand feet (1,000 ft) or in designated mountainous terrain six hundred metres (600 m) or two thousand feet (2,000 ft) above all obstacles located in the area specified, rounded up to the nearest next higher thirty metres (30 m) or one hundred feet (100 ft);

"area navigation" means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground – or spacebased navigation aids or within the limits of the capability of self-contained aids, or a combination of these;

"area navigation route" means an ATS established for the use of aircraft capable of employing area navigation;

"arrival routes" means routes identified in an instrument approach procedure by which aircraft may proceed from the *en route* phase of flight to an initial approach fix;

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

"assemble" means a process of merging data from multiple sources into a database and establishing a baseline for subsequent processing;

"ATS surveillance service" means the service provided directly by means of an ATS surveillance system;

"ATS surveillance system" includes an ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft; Note: A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

"Authority" means the Guyana Civil Aviation Authority (GCAA) established under the Act;

"automatic terminal information service" means the automatic provision of current, routine information to arriving and departing aircraft throughout twenty-four hours or a specified portion thereof;

"bare earth" means a surface of the earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects;

"base turn" means a turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track where the tracks are not reciprocal;

"calendar" means a discrete temporal reference system that provides the basis for defining temporal position to a resolution of one (1) day (ISO 19108*);

"canopy" means bare earth supplemented by vegetation height;

"change-over point" means the point at which an aircraft navigating on an ATS route segment defined by reference to VOR is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft; "Chicago Convention" means the Chicago Convention on International Civil Aviation concluded at Chicago on 7th December, 1944 and includes any Protocol amending the Convention and any Annex to the Convention relating to international standards and recommended practices, being an Annex adopted in aerodrome with that Convention;

"ceiling" means the height above the ground or water of the base of the lowest layer of clouds below 6,000 metres (20 000 feet) covering more than half the sky;

"clearance limit" means the point to which an aircraft is granted an air traffic control clearance;

"clearway" means a defined rectangular area on the ground or water under the control of the appropriate authority selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height;

"conference communications" means communication facilities whereby direct speech conversation may be conducted between three or more locations simultaneously;

"contour line" means a line on a map or chart connecting points of equal elevation;

"Contracting State" means a party to the Chicago Convention;

"control area" means a controlled airspace extending upwards from a specified limit above the earth; "controlled aerodrome" means an aerodrome at which air traffic control service is provided to aerodrome traffic;

"controlled airspace" means an airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification;

"controlled flight" means any flight which is subject to an air traffic control clearance;

"controller pilot data link communications" means a means of communication between controller and pilot, using data link for ATC communications;

"control zone" means a controlled airspace extending upwards from the surface of the earth to a specified upper limit;

"cruising level" means a level maintained during a significant portion of a flight;

"culture" means all man-made features constructed on the surface of the Earth, such as cities, railways and canals;

"current flight plan" means the flight plan, including changes, if any, brought about by subsequent clearances;

"cyclic redundancy check" means a mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data;

"danger area" means an airspace of defined dimensions within which

activities dangerous to the flight of aircraft may exist at specified times;

"database" means one (1) or more files of data so structured that appropriate applications may draw from the files and update them;

"data link communications" means a form of communication intended for the exchange of messages via a data link;

"data link-automatic terminal information service" means the provision of ATIS via data link;

"data link-VOLMET" means the 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;

"data product" means a data set or data set series that conforms to a data product specification;

"data product specification" means a 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;

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

"data quality" means 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" means an identifiable collection of data;

"data set series" means a collection of data sets sharing the same product specification;

"datum" means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities;

"declared capacity" means a measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities and it is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace;

"DETRESFA" means the code word used to designate a distress phase;

Note: DTM is sometimes referred to as DEM.

"Digital Elevation Model" means the representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum;

"direct transit arrangements" means 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; "displaced threshold" means a threshold not located at the extremity of a runway;

"distress phase" means a situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance;

"downstream clearance" means a clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft;

"electronic aeronautical chart display" means an electronic device by which flight crews are enabled to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information;

"elevation" means the vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level;

"ellipsoid height or Geodetic height" means the height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question;

"emergency phase" means, as the case may be, an uncertainty phase, alert phase or distress phase;

"estimated time of arrival" means -

(a) for IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome; and

(b) for VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome;

"feature" means abstraction of real world phenomena;

"feature attribute" means characteristic of a feature;

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

"feature operation" means operation that every instance of a feature type may perform;

"feature relationship" means relationship that links instances of one feature type with instances of the same or a different feature type;

"feature type" means class of real world phenomena with common properties;

"final approach" means that part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified —

- (a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
- (b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which—

- (i) a landing can be made; or
- (ii) a missed approach procedure is initiated;

"final approach and take-off area" means a defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected takeoff area available;

"final approach fix or point" means that fix or point of an instrument approach procedure where the final approach segment commences;

"final approach segment" means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished;

"flight crew member" means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period;

"flight information centre" means a unit established to provide flight information service and alerting service;

"flight information region" means an airspace of defined dimensions within which flight information service and alerting service are provided;

"flight information service" means a service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights;

"flight level" means a surface of constant atmospheric pressure which is related to a specific pressure datum, 10 13.2 hectopascals, and is separated from other such surfaces by specific pressure intervals;

"flight plan" means specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft;

"fly-by waypoint" means a waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure;

"flyover waypoint" means a waypoint at which a turn is initiated in order to join the next segment of a route or procedure;

"forecast" means a statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace;

"geodetic datum" means a minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system or frame;

"geodesic distance" means the shortest distance between any two points on a mathematically defined ellipsoidal surface;

"geographical position" means a set of latitude and longitude coordinates referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth;

"geoid" means the equipotential surface in the gravity field of the Earth which coincides with the undisturbed MSL extended continuously through the continents; "geoid undulation" means the distance of the geoid above or below the mathematical reference ellipsoid;

"glide path" means a descent profile determined for vertical guidance during a final approach;

"gregorian calendar" means calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar;

"heading" means the direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North;

"height" means the vertical distance of a level, a point or an object considered as a point, measured from a specified datum;

"helicopter stand" means an aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations;

"heliport" means 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;

"holding procedure" means a predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance;

"hot spot" means a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots or drivers is necessary; "human factors principles" mean principles which apply to aeronautical de-sign, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance;

"human performance" means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations;

"hypsometric tints" means a succession of shades or colour gradations used to depict ranges of elevation;

"Instrument Flight Rules flight" means a flight conducted in accordance with the instrument flight rules;

"INCERFA" means the code word used to designate an uncertainty phase;

"incident" means an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation;

"instrument approach procedure" means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or *en route* obstacle clearance criteria apply;

"initial approach segment" means that segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point;

"instrument meteorological conditions" means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions;

"integrated aeronautical information package" means a package which consists of the following elements:

- (a) AIP, including amendment service;
- (b) supplements to the AIP;
- (c) NOTAM and PIB;
- (d) AIC; and
- (e) checklists and lists of valid NOTAM;

"integrity of aeronautical data" means a degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorised amendment;

"intermediate approach segment" means that segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, racetrack or dead reckoning track procedure and the final approach fix or point, as appropriate;

"intermediate holding position" means a designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower; "international airport" means any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out;

"international NOTAM office" means an office designated by a State for the exchange of NOTAM internationally;

"isogonal" means a line on a map or chart on which all points have the same magnetic variation for a specified epoch;

"isogriv" means a line on a map or chart which joins points of equal angular difference between the North of the navigation grid and Magnetic North;

"landing area" means that part of a movement area intended for the landing or take-off of aircraft;

"landing direction indicator" means a device to indicate visually the direction currently designated for landing and for take-off;

"level" means a generic term relates to the vertical position of an aircraft in flight and includes , height, altitude or flight level;

"logon address" means a specified code used for data link logon to an ATS unit;

"magnetic variation" means the angular difference between True North and Magnetic North;

"manoeuvring area" means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons;

"marking" means a symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information;

"MEA" means 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;

"metadata" means data about data;

"meteorological office" means an office designated to provide meteorological service for international air navigation;

"minimum sector altitude" means the lowest altitude which may be used which will provide a minimum clearance of three hundred metres (300 m) or one thousand feet (1,000 ft) above all objects located in an area contained within a sector of a circle of forty-five kilometres (45 km) or twenty-five (25) nautical miles radius centred on a radio aid to navigation;

"missed approach point" means that point in an instrument approach procedure at or before which the specified missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed;

"missed approach procedure" means the procedure to be followed where the approach cannot be continued;

"MOCA" means the minimum altitude for a defined segment of flight that provides the required obstacle clearance; "movement area" means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron;

"navigation specification" means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace and is of two kinds as follows:

- (a) required navigation performance specification which is a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP such as RNP 4, RNP APCH; and
- (b) area navigation (RNAV) specification which is a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV such as RNAV 5, RNAV 1;

"neat line" means a border line commonly drawn around the extent of a map or chart and separates the data from the rest of the surrounding area;

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

"obstacle" means all temporary or permanent fixed and mobile objects, or parts thereof, that—

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

"obstacle clearance altitude or obstacle clearance height" means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

"obstacle free zone" means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes;

"operator" means a person, organisation or enterprise engaged in or offering to engage in an aircraft operation;

"orthometric height" means height of a point related to the geoid, generally presented as a MSL elevation;

"performance-based navigation" means area navigation based on performance requirements for aircraft operating along
an ATS route on an instrument approach procedure or in a designated airspace

"pilot-in-command" means the pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight;

"point light" means a luminous signal appearing without perceptible length;

"portrayal" means presentation of information to humans;

"post spacing" means angular or linear distance between two adjacent elevation points;

"procedure turn" means a manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track;

"precision" means the smallest difference that can be reliably distinguished by a measurement process;

"precision approach procedure" means an instrument approach procedure utilising azimuth and glide path information provided by ILS or PAR;

"pre-flight information bulletin" means a presentation of current NOTAM information of operational significance, pre-pared prior to flight;

"pressure-altitude" means an atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere; "printed communications" means communications which automatically pro-vide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit;

"procedure altitude or height" means a specified altitude or height flown operationally at or above the minimum altitude or height and established to accommodate a stabilised descent at a determined descent gradient or angle in the intermediate or final approach segment;

"prohibited area" means an airspace of defined dimensions, above the land areas or territorial waters of a State, in which the flight of aircraft is prohibited;

"quality" means the degree to which a set of inherent characteristics fulfils requirements;

Note 1: The term "quality" can be used with adjectives such as poor, good or excellent.

Note 2: "Inherent", as opposed to "assigned", means existing in something, especially as a permanent characteristic.

"quality assurance" means the part of quality management focused on providing confidence that quality requirements will be fulfilled;

"quality control" means the part of quality management focused on fulfilling quality requirements;

"quality management" means the coordinated activities to direct and control an organisation with regard to quality;

"RCP" means a statement of the performance requirements for

operational communication in support of specific ATM functions;

"RCP type" is a label such as RCP 240 that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity;

"radar vectoring" means provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar;

"radio navigation service" means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more navigation aids;

"radiotelephony" means a form of radio communication primarily intended for the exchange of information in the form of speech;

"relief" means the inequalities in elevation of the surface of the Earth represented on aeronautical charts by contours, hypsometric tints, shading or spot elevations;

"repetitive flight plan" means a flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units;

"reporting point" means a specified geographical location in relation to which the position of an aircraft can be reported; "requirement" means the need or expectation that is stated, generally implied or obligatory;

Note 1: "Generally implied" means that it is custom or common practice for the organisation, its customers and other interested parties, that the need or expectation under consideration is implied.

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

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

Note 4: Requirement can be generated by different interested parties.

"rescue coordination centre" means a unit responsible for promoting efficient organisation of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region;

"resolution" means a number of units or digits to which a measured or calculated value is expressed and used;

"restricted area" means 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;

"reversal procedure" means a procedure designed to enable aircraft to reverse direction during the initial approach segment of an instrument approach procedure and the sequence may include procedure turns or base turns; "RNAV specification" means a navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV such as RNAV 5 and RNAV 1;

"RNP specification" means a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP such as RNP 4 and RNP APCH;

"route stage" means a route or portion of a route flown without an intermediate landing;

"runway" means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft;

"runway-holding position" means a designated position intended to protect a runway, an obstacle limitation surface, or an ILS or MLS critical or sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorised by the aerodrome control tower;

Note: In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.

"runway strip" means a defined area including the runway and stopway, provided, intended —

- (a) to reduce the risk of damage to aircraft running off a runway; and
- (b) to protect aircraft flying over it during take-off or landing operations;

"runway visual range" means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line;

"shoulder" means an area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface;

"SIGMET information" means information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified *en route* weather phenomena which may affect the safety of aircraft operations;

"significant point" means a specified geographical location used in defining an air traffic service route or the flight path of an aircraft and for other navigation and air traffic service purposes;

"special Visual Flight Rules flight" means a flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC;

"State safety programme" means an integrated set of regulations and activities aimed at improving safety;

"station declination" means an alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated;

"stopway" means a defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off; "taxiing" means movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing;

"taxi route" means a defined path established for the movement of helicopters from one part of a heliport to another and includes a helicopter air or ground taxiway which is centred on the taxi-route;

"taxiway" means a defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one (1) part of the aerodrome and another, including—

- (a) aircraft stand taxilane which is a portion of an apron designated as a taxiway and intended to provide access to aircraft stands only;
- (b) apron taxiway which is a portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron;
- (c) rapid exit taxiway which is a taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxi-ways thereby minimising runway occupancy times;

"terminal arrival altitude" means the lowest altitude that will provide a minimum clearance of three hundred metres (300 m) or one thousand feet (1,000 ft) above all objects located in an arc of a circle defined by a forty-six kilometres (46 km) or twenty-five (25) nautical metres radius centred on the IAF, or where there is no IAF on the IF, delimited by straight lines joining the extremity of the arc to the IF; and the combined TAAs associated with an approach procedure shall account for an area of three hundred and sixty (360) degrees around the IF;

"terminal control area" means a control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes;

"terrain" means 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;

"threshold" means the beginning of that portion of the runway usable for landing;

"touchdown and lift-off area" means a load bearing area on which a helicopter may touch down or lift-off;

"touchdown zone" means the portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway;

"traceability" means the ability to trace the history, application or location of that which is under consideration;

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

"track" means the projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from True North, Magnetic North or Grid North; "traffic avoidance advice" means advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision;

"traffic information" means information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision;

"transfer of control point" means a defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next;

"transferring unit" means air traffic control unit in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit along the route of flight;

"transition altitude" means the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes;

"uncertainty phase" means a situation where uncertainty exists as to the safety of an aircraft and its occupants;

"validation" means confirmation through the provision of objective evidence that the requirements for a specific intended use or application have been fulfilled;

"vectoring" means the provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system;

"verification" means confirmation through the provision of objective evidence, that specified requirements have been fulfilled;

Note 1: The term "verified" is used to designate the corresponding status.

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

"visual flight rules flight" means a flight conducted in accordance with the visual flight rules;

"visual approach procedure" means a series of predetermined manoeuvres by visual reference, from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, where a landing is not completed, a go-around procedure can be carried out;

"visual meteorological conditions" means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima;

"voice-automatic terminal information service" means the provision of ATIS by means of continuous and repetitive voice broadcasts;

"VOLMET broadcast" means the provision, as appropriate, of current ME-TAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts;

"waypoint" means a specified geographic location used to define an area navigation route or the flight path of an aircraft employing area navigation and is identified either as—

(a) fly-by waypoint; or

(b) flyover waypoint.

(2) In these Regulations –

"ACAS" means Airborne Collision Avoidance System;

"ADS" means Automatic Dependent Surveillance;

"ADS-B" means Automatic Dependent Surveillance – Broadcast;

"ADS-C" means Automatic Dependent Surveillance - Contract;

"ADIZ" means Air Defence Identified Zone;

"AFS" means Aeronautical Fixed Service;

"AFTN" means Aeronautical Fixed Telecommunication Network;

"AGA" means Aerodrome, Air routes and Ground Aids;

"AIC" means Aeronautical Information Circular;

"AIP" means Aeronautical Information Publication;

"AIRAC" means Aeronautical Information Regulation and Control;

"AIRMET" means Airmen's Meteorological Information;

"AIS" means Aeronautical Information Services;

"AME" means area minimum altitude;

"ATFM" means Air Traffic Flow Management;

"ATM" means Air Traffic Management

"ATIS" means Automatic Terminal Information Service;

"ATS" means Air Traffic Services;

"COM" means Communications;

"CPDLC" means Controller-Pilot Data Link Communications;

"CRC" means Cyclic Redundancy Check;

"D-ATIS" means Data link-Automatic Terminal Information Service;

"DEM" means Digital Elevation Model;

"DME/P" means Precision Distance Measuring Equipment;

"DTM" means Digital Terrain Model;

"D-VOLMET" means Data link-VOLMET;

"EGM" means Earth Gravitational Model;

"EGNOS" means European Geostationary Navigation Overlay Service;

"ELT" means Emergency Location Transmitter;

"FATO" means Final Approach and Take-Off Area;

"FIR" means Flight Information Region;

"FL" means Flight Level;

"GBAS" means Ground Based Augmentation System;

"GLONASS" means Global Orbiting Navigation Satellite System;

"GNSS" means Global Navigation Satellite System;

"GPS" means Global Positioning System;

"H24" means Continuous day and night service;

"ICAO" means International Civil Aviation Organisation;

"IFR" means Instrument Flight Rules;

"ILS" means Instrument Landing System;

"IMC" means Instrument Meteorological Conditions;

"INS" means Inertial Navigation System;

"ISO" means International Organisation for Standardisation;

"MEA" means minimum *en route* altitude

"MET" means Meteorology;

"METAR" means aerodrome routine meteorological reports;

"MLS" means Microwave Landing System;

"MOCA" means Minimum Obstacle Clearance Altitude;

"MSAS" means Multi-functional transport Satellite-based Augmentation System;

"MSL" means Mean Sea Level;

"NM" means Nautical Miles;

"NOTAM" means Notices to Airmen;

"NDB" means Non-Directional Radio Beacon;

"OIS" means Obstacle Identified Surface;

"PAN-OPS" means Procedures for Air Navigation Services Operations;

"PAR" means Precision Approach Radar;

"PIB" means Pre-flight Information Bulletin;

"PCN" means Pavement Classification Number;

"PSR" means Primary Surveillance Radar;

"RCP" means Required Communication Performance;

"RNAV" means Area Navigation;

"RNP" means Required Navigation Performance;

"RVR" means Runway Visual Range;

"SAR" means Search and Rescue;

"SARPS means Standards and Recommended Practices;

"SBAS" means Satellite-Based Augmentation System;

"SPECI" means aerodrome special meteorological reports;

"SIGMET" means information concerning *en route* weather phenomena which may affect the safety of aircraft operations;

"SRE" means Surveillance Radar Element of Precision Approach Radar System;

"SSR" means Secondary Surveillance Radar;

"SUPPS" means Regional Supplementary Procedures;

"TAF" means aerodrome meteorological forecast;

"TLOF" means Touchdown and Lift Off Area;

"TMA" means Terminal Control Area;

"UIR" means Upper Flight Information Region;

"UTC" means Coordinated Universal Time;

"VFR" means Visual Flight Rules;

"VHF" means Very High Frequency;

"Voice-ATIS" means Voice-Automatic Terminal Information Service;

"VOLMET" means Meteorological Information for Aircraft in Flight;

"VOR" means VHF Omni Range;

"WAC" means World Aeronautical Chart-ICAO;

"WAAS" means Wide Area Augmentation System;

"WDI" means Wind Direction Indicator;

"WGS" means World Geodetic System.

PART II **PROVISION OF AIR NAVIGATION** SERVICES

Requirements **3.** A person shall not provide air navigation services unless-(a) he is designated to so do or is approved

- by the Authority issued under these Regulations; and
- (b) the services are provided in accordance with-
 - (i) the requirements specified by the Authority in the applicable schedules to these regulations or any other publication of the Authority; and
 - (ii) the procedures specified in the Manual of Air Navigation Service Operations (MANSOPs).

Application to 4. A person or company wishing to provide air provide air navigation services shall make an application in a form navigation specified by the Authority and such application shall be services. accompanied by -

> (a) the applicant's Manual of Air Navigation Service Operations (MANSOPs)

for the provision of air navigation services.

provided under Regulation 10 (1), for approval;

- (b) a written statement setting out the services and locations at which they shall be provided;
- (c) the safety management system manual;
- (d) the quality management system manual;
- (e) the procedures to meet the requirements of the *Civil Aviation (Security) Regulations,* 2013 made under the Act;
- (f) a written statement on financial capability to provide the service;
- (g) the insurance policy in force in relation to the services provided; and.
- (h) fees as specified by the Authority.

^{ff} 5. (1) The Authority shall, before issuing an approval, or designating an Air Navigation Service Provider (ANSP), be satisfied that—

- (a) the personnel of the applicant are adequate in number and have the necessary competency to provide the service;
- (b) the MANSOPs prepared and submitted with the application contains all the relevant information;
- (c) the facilities, services and equipment are established in accordance with these Regulations;
- (d) the operating procedures make satisfactory provision for the safety of aircraft;
- (e) an approved safety management system is in place;

Designation of Air Navigation Service Provider and issuance of approval.

- (f) an approved quality management system is in place;
- (g) the applicant has approved procedures to meet the requirements of the Civil Aviation (Security) Regulations made under the Act;
- (h) the applicant has financial capability to provide the service; and
- (i) the applicant has insurance policy in force in relation to the services provided.

(2) Subject to sub-regulation (1), the Authority may set any other conditions as may be deemed necessary.

(3) The provision of air navigation services shall be subject to compliance with these Regulations and any other condition as may be specified or notified by the Authority.

(4) The Authority may refuse to permit any person or company or grant approval to an applicant, and where the Authority refuses, it shall notify the person, company or applicant in writing, of the reasons for the refusal, not later than fourteen days after making that decision.

Format of 6. Any approval shall be in written format and shall include the following information -

- (a) the ANSP's name and physical and mailing address of its principal place of business;
- (b) the type of services to be provided;
- (c) the location of services to be provided;
- (d) for air traffic service the service to be provided within a particular airspace or controlled aerodrome designated to the provider by the Authority;
- (e) conditions of approval; and
- (f) effective and expiry dates of the approval.

approval.

Transfer of designation or approval to provide air navigation services issued under these Regulations shall not be transferable.

Suspension, variation and cancellation of approvals.

providers.

8. (1) The Authority may, suspend provisionally, pending further investigation, any approval issued under these Regulations, if it considers that —

- (a) a relevant provision of the Act or these Regulations, or a condition in the certificate, has not been or is not being complied with;
- (b) false or materially incorrect information was given to the Authority in the application for the approval; or
- (c) it is in the public interest to do so.

(2) The Authority may, upon the completion of an investigation which has shown sufficient ground to the Authority's satisfaction suspend, vary or cancel any approval issued under these Regulations.

Register of Air
Navigation
Services9. (1) The Authority shall keep and maintain a register
showing—

- (a) name of the ANSP;
- (b) date of issue or renewal of the approval;
- (c) type of service offered by the ANSP;
- (d) expiry date of the approval;
- (e) date of variation, suspension or cancellation of the approval, if applicable;
- (f) physical and postal address of the holder of the ANSP; and
- (g) any other particulars as may be determined by the Authority.

(2) Any changes in the particulars recorded under sub-regulation (1) shall be entered in the register by the Authority.

(3)The register shall be a public document and any particular entered may be obtained upon payment of such a fee as may be specified by the Authority.

PART III MANUAL OF AIR NAVIGATION SERVICES OPERATIONS

Manual of Air Navigation Services Operations (MANSOPS). **10.** (1) The Manual of Air Navigation Services Operations (MANSOPS) submitted under these Regulations shall be—

- (a) type written;
- (b) signed by the service provider;
- (c) in a format that is easy to revise and includes a list of effective pages; and
- (d) organised in a manner that facilitates evaluation and approval processes.

(2) An ANSP shall keep at least one approved copy of the manual at the principal place of business.

Contents of MANSOPS **11.** A Manual of Air Navigation Service Operations (MANSOPS) shall contain all information and instructions necessary to enable the personnel of an air navigation service provider to perform their duties and in particular shall include—

- (a) introduction;
- (b) management organisation;
- (c) services to be provided;
- (d) personnel requirements and their

responsibilities;

- (e) training and performance assessment of staff and how that information is tracked;
- (f) Safety Management System and Quality Management System;
- (g) contingency plans developed for part or total system failure;
- (h) compliance with the *Civil Aviation* (*Security*) *Regulations* as required;
- (i) facilities and equipment and how they are installed and maintained;
- (j) fault and defect reporting;
- (k) maintenance of documents and records;
- facility operations and maintenance plan and procedures;
- (m) search and rescue responsibilities and coordination, operations, plan and procedures;
- (n) the proposed hours of service;
- (o) systems and procedures in the provision of air navigation services; and
- (p) any other information requested by the Authority.

PS **12.** (1) For the purposes of maintaining the accuracy of the information in the MANSOPs, the –

- (a) ANSP shall whenever necessary, amend the manual; or
- (b) Authority may issue a written directive requiring the holder of a certificate to amend the manual.
- (2) Notwithstanding sub-regulation (1), the ANSP

Accuracy of MANSOPS

shall submit the proposed amendment to the Authority for approval, before the manual is amended.

PART IV AIR NAVIGATION SERVICES

| Air | 13. The Authority shall designate a service provider in | |
|--|---|--|
| Navigation | accordance with these Regulations to provide – | |
| Provider | | |
| | (a) air traffic services; | |
| | (b) communication, navigation and surveillance systems; | |
| | (c) meteorological services for air navigation; | |
| | (d) aeronautical search and rescue coordination; | |
| | (e) aeronautical information services, aeronautical maps and charts; or | |
| | (f) for the construction of visual and instrument flight procedures. | |
| Air Navigation | 14. A designated air navigation service provider shall – | |
| Services facilities and standard systems. | (a) provide in the designated portion of airspace and aerodromes, facilities for the provision of air navigation services; and | |
| | (b) adopt and put into operation the appropriate standard systems, operational practices and rules as specified by the Authority. | |
| Approval of Air Navigation Services | 15. A person shall not install, maintain and operate air navigation service facilities in the designated airspaces and aerodromes without approval of the Authority. | |

facilities.

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air navigation facilities, services, documents and records of the Air air navigation service provider which may be necessary to Navigation determine compliance with these Regulations. Services. (2) The safety inspections shall be carried out in accordance with the requirements specified by the Authority. (3) The Authority may impose operating restrictions or sanctions on the operations of an ANSP in the event of nonconformance with the approval requirements or any unresolved safety concerns. Access to air 17. An inspector of the Authority shall have unrestricted navigation access to the facilities, installations, records and documents of facilities. the air navigation services and the air navigation meteorological service provider to determine compliance with these Regulations. Production of 18. An ANSP shall produce any relevant documents documents. under its possession if requested by an authorised person within seventy-two hours of such request.

16. (1) The Authority shall carry out safety inspections of

19. (1) An ANSP shall develop and maintain contingency plans for implementation in the event of disruption or potential disruption, of air navigation services in the airspace for which the ANSP is responsible.

(2) The ANSP shall liaise with other air navigation service providers in adjacent or contiguous airspaces while developing contingency plans.

(3) The contingency plan shall include –

- (a) the actions to be taken by the ANSP's personnel responsible for providing the service;
- (b) possible alternative arrangements for providing the service; and
- (c) the arrangements for resuming normal operations for the service.

(4) The contingency plan shall be developed in accordance with the requirements specified by the Authority.

Air Navigation Services contingency plan.

Safety

inspections on

Alternative designated service provider. **20.** (1) The Authority may, when considered necessary and in the public interest, designate an alternative service provider for a specified period to provide air navigation services.

Units of **21.** The units of measurement used in air and ground operations shall be as specified by the Authority.

PART V

AIR TRAFFIC SERVICES

Applicability. **22.** This Part is applicable to the requirements for air traffic services including organisation, flight information services and alerting services with respect to ATS operations in Guyana.

Establishment of ATS. Schedule 1 Part A. 23. (1) The Director General shall determine, in accordance with standards prescribed in Part A of Schedule 1 and for the territories over which the Authority has jurisdiction, those portions of the airspace and those aerodromes where air traffic service will be provided.

> (2) The Director General shall make the necessary arrangements for ATS to be established and provided in accordance with Schedule 1, except by mutual agreement, the Authority may delegate to another State the responsibility for establishing and providing ATS in flight information regions, control areas or control zones extending over the territories for which the Authority has control.

> (3) Those portions of airspace over the high seas or in airspace of undetermined sovereignty where ATS will be provided, shall be determined on the basis of regional navigation agreements.

> (4) Where ATS are established, information shall be published as necessary to permit the utilisation of the ATS.

(5) The Guyana Civil Aviation Authority (GCAA) is the statutory authority responsible for providing Air Traffic Services in Guyana and no other agency shall provide Air Traffic Services unless designated or approved by the Director General of Civil Aviation.

| Organisation, control responsibility and service | 24. (1) The Authority shall establish an acceptable level of safety to be achieved in the provision of ATS. | | |
|---|--|--|--|
| and service. | (2) The ATS provider, shall establish an acceptable Safety Management System (SMS) that shall be: | | |
| | | (a) established in accordance with the framework elements contained in Schedule 1 of these regulations; and | |
| | | (b) commensurate with the size of the service provider and the complexity of its services. | |
| Schedule 1 Part A. | (3) The SMS of an AT with sub-regulation (2), | 'S provider established in accordance . shall be – | |
| | (a) | subject to the acceptance of the Director General and | |
| Schedule 1 | (b) | shall ensure that the organisation and designation of airspace and ATS safety management programmes in Guyana are in accordance with the applicable standards by mutual agreement of the associated signatory States to regional air navigation agreement prescribed in Part A of Schedule 1. | |

Contingency plans for distribution or potential distribution for ATS routes. **25.** (1) The Authority shall ensure the development and dissemination of contingency plans for implementation in the event of disruption or potential disruption of ATS and related supporting services in the airspace for which the Authority is responsible.

(2) The contingency plans under sub-regulation (1) shall be developed in close coordination with operators' affected or likely to be affected, with the assistance of ICAO as necessary.

Provision of ATS. **26.** The Director General shall provide air traffic control services to all—

- (a) IFR flights in airspace Classes A, B, C, D, and E as applicable;
- (b) VFR flights in airspace Classes B, C, and D as applicable;
- (c) special VFR flights; and
- (d) aerodrome traffic at controlled aerodromes.

Restriction on 27. (1) A person shall not issue an air traffic control the provision clearance or an air traffic control instruction, in the case of of ATS. international airspace in respect of which Guyana has accepted, by means of a regional air navigation agreement, the responsibility of providing air navigation services, except in accordance with the standards prescribed in Part B of Schedule 1. Schedule 1 (2) Air traffic control services, control responsibilities and control clearances shall be in accordance with the standards Schedule 1 prescribed in Part B of Schedule 1. Part B (3) The applicant for the provision of air traffic Provision of air traffic services shall specify in the application the portions of the services and airspace and the aerodromes within which air traffic services personnel shall be provided. competency requirements. (4) The air traffic services provider shall ensure that the services are provided in accordance with requirements specified by the Authority.

> (5) The air traffic services provider shall ensure that personnel providing air traffic services are competent to provide air traffic services in the designated airspace and at the aerodromes as specified by the Authority.

> (6) A person shall not provide a function related to the provision of air traffic services unless that person –

- (a) has successfully completed training in the performance of that function; and
- (b) has been licenced in accordance with the Civil Aviation (Personnel Licencing) Regulations.

| Prohibition on the performance of duty on air traffic controllers. | 28. A person shall not perform any duty as an air traffic controller — | | |
|--|--|--|--|
| | (a) within eight hours after consumption of alcohol; | | |
| | (b) while under the influence of alcohol; or | | |
| | (c) while under the influence of any drug or other substances that would impair his ability to perform his duties and thereby jeopardise aviation safety. | | |
| RNP for en route operations. | 29. (1) The Authority shall prescribe navigation specification for performance-based navigation (PBN) operations which may be limited by navigational infrastructure constraints or specific navigation functionality requirements. | | |
| | (2) Where applicable, navigation specification for designated areas, tracks or ATS routes shall be determined on the basis of regional air navigation agreements. | | |
| | (3) The navigation specification prescribed under sub-regulation (1), shall be appropriate to the level of communications, navigation and ATS provided in the airspace concerned. | | |
| Control of persons and vehicular traffic at aerodromes. Schedule 1 Part B. | 30. The Authority shall ensure that the movement of persons and vehicular traffic at aerodromes is controlled in accordance with the standards prescribed in Part B of Schedule 1. | | |
| Provision of flight information service. | 31. (1) Flight information service shall be provided to all aircraft which are likely to be affected by the flight information and which are $-$ | | |
| | (a) provided with air traffic control service; or | | |
| | (b) otherwise known to the relevant ATS units. | | |

(2) Where ATS units provide both flight information and air traffic control service, the provision of air traffic control

| | information service where the provision of air traffic control service so requires. |
|---|---|
| Flight information service to aircraft. Schedule 1 Part C. | 32. The Authority shall ensure that the following flight information services are provided in accordance with the applicable standards prescribed in Part C of Schedule 1: |
| | (a) voice-automatic terminal information service (voice-ATIS broadcast); |
| | (b) data link automatic terminal information service (D-ATIS); |
| | (c) automatic terminal information service (voice and/or data link); |
| | (d) ATIS for arriving and departing aircraft; and |
| Alerting service. | (e) ATIS for arriving aircraft.33. The Authority shall ensure that — |
| | (a) alerting service is provided — |
| | (i) for all aircraft provided with an air traffic service; |
| | (ii) where practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic services; and |
| | (iii) to any aircraft known or believed to be the subject to an act of unlawful interference; |
| Schedule 1 Part D. | (b) the following alerting services are provided in accordance with the standards prescribed in Part D of Schedule 1: |
| | (i) the notification of rescue co- ordinating centres; |
| | (ii) the plotting of an aircraft in a state of emergency; |

service shall have precedence over the provision of flight

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- (iii) the use of communication facilities;
- (iv) information to an operator; and
- (v) information to aircraft operating in the vicinity of an aircraft in a state of emergency.

34. (1) The Authority shall ensure communications for the following are provided in accordance with the standards prescribed in Part E of Schedule 1:

- (a) aeronautical mobile service (air-ground communications);
- (b) aeronautical fixed service (groundground communications);
- (c) surface movement control service; and
- (d) aeronautical radio navigation service,

(2) Where air-ground voice communication channels are used for area control service and are worked by air-ground communicators, suitable arrangements shall be made by the Director General to permit direct pilot-controller voice communications, when required.

(3) Where conditions warrant the provision of aerodrome control service, the Authority shall ensure that separate communication channels are provided for the control of traffic operating on the manoeuvring area.

35. (1) The Authority shall ensure that air traffic service requirements for information are in accordance with the standards prescribed in Part F of Schedule 1.

(2) An ANSP shall establish training programmes and procedures to assess and ensure the initial and continuing competence of operational personnel including continued competence in using new equipment, procedures and updated communications.

Communicatio n requirement for Air Traffic Service. Schedule 1 Part E.

Information requirement for Air Traffic Service. Schedule 1 Part F.

Training and assessment

(3)The programmes and procedures in subregulation (a) shall ensure that operational personnel are trained, given regular recurrent training in normal and emergency procedures and are assessed on such.

(4)ATS surveillance service shall be provided in accordance with the standards prescribed in Part B of Schedule Provision of 1. Surveillance

> (5) The air traffic services provider shall establish procedures for the notification, investigation, and reporting of the air traffic incidents which shall be made in a prescribed incident form.

(6) The ATS provider shall establish and implement a Runway Safety Programme required to reduce the number of runway-related accidents and incidents. This programme will mitigate the risks of runway incursions, runway excursions and other events linked to Runway Safety.

(7) The air traffic services provider shall develop policies and procedures for determining the capacity of the ATS System and the need for implementation of and Air Traffic Flow Management in accordance with the standards prescribed in Part B of Schedule 1.

ATS System Capacity and Air Traffic Flow Management

ATS

Services.

Air Traffic Incidents

Runway

Programme

Safety

PART VI **AERONAUTICAL INFORMATION** SERVICES

Definition of Aeronautical Information Services. Schedule 8.

Provision of

Aeronautical

Information Services.

36.

mean the services necessary to meet the standards prescribed in Schedule 8.

(1) In this Part "aeronautical information services"

(1) The Director General shall be responsible for 37. providing aeronautical information services.

(2) The Director General shall take all necessary steps to ensure that -

- (a) the provision, supply, quality assurance, application and usage of aeronautical information services are in accordance with mutual agreement with signatory States to the air navigation regional agreement and in accordance with the standards prescribed in Part A of Schedule 8;
- (b) the aeronautical information and aeronautical data the Authority provides relating to Guyana as well as areas in which the Authority is responsible for providing services outside the territory of Guyana, is adequate, of the required quality and timely;
- (c) the necessary arrangements are made for the timely receipt of the required information and aeronautical data to the aeronautical information services from other services associated with aircraft operation;
- (d) arrangements are made to obtain aeronautical information and aeronautical data from the aeronautical information services of other States or from other sources that may be available to the Authority to provide pre-flight information service and to meet the need for in-flight information;
- (e) aeronautical information published for and on behalf of a Contracting State by the Authority clearly indicates that it is published under the authority of that Contracting State; and
- (f) aeronautical information and aeronautical data obtained from other sources that may be available are verified before distribution and if not verified shall when distributed be clearly identified as not being verified.

Schedule 8 Part A. Schedule 16. (3) A person shall not provide aeronautical information services except in accordance with the standards prescribed in Schedule 8 and Schedule 16.

Establishment of a Quality Management System. Schedule 8 Part A.

38. (1) The Director General shall ensure that quality management systems are implemented and maintained encompassing all functions of an aeronautical information service as specified in clause 8 in Part A of Schedule 8.

(2) The execution of quality management under subregulation (1) shall be made demonstrable for each function stage, where required.

(3) In a quality management system, the skills and knowledge required for each function shall be identified and the personnel assigned to perform those functions shall be appropriately trained.

(4) The Director General shall ensure within the context of the established quality management system, that –

- (a) personnel possess the skills and competencies required to perform specifically assigned functions;
- (b) appropriate records are maintained so that the qualification of personnel can be confirmed;
- (c) initial and periodic assessments shall be established that require personnel to demonstrate the required skills and competencies;
- (d) periodic assessments of personnel shall be used as a means to dictate and correct short falls; and
- (e) each quality management system includes the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify aeronautical data is traceable throughout the aeronautical in-formation 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.

39. The Director General shall ensure that the form, contents, specifications and distribution of aeronautical information publications for the publication and exchange of aeronautical information essential to air navigation, are in accordance with the standards prescribed in Part B of Schedule 8.

40. The Director General shall ensure that the origination, general specifications and distribution of NOTAM are in accordance with the standards specified in Part C of Schedule 2.

41. The Director General shall ensure that the general specifications, form of publication, distribution and control of aeronautical information regulation and control are in accordance with the standards prescribed in Part D of Schedule 8.

42. The Director General shall—

(a) ensure that the general specifications, origination and distribution of aeronautical information circulars are in accordance with the standards prescribed in Part E of Schedule 8; and

(*b*) select the AIC that is to be given international distribution, and give it the same distribution as for AIP.

43. The Director General shall—

(*a*) ensure that pre-flight and post flight information and the application of automated aeronautical information systems are in accordance with the standards prescribed in Part F of Schedule 8; and

(b) make available to flight operations personnel, including flight areas and

Form, contents. specification and distribution of AIP. Schedule 8 Part B. Origination, general specification and distribution of Schedule 8 Part C. General specification, form of publication, distribution and control of AIRAC. Schedule 8 Part D.

General specification, origination and distribution of AIC.

Schedule 8 Part E.

Pre-flight and post-flight information and data.

Schedule 8 Part F. services responsible for pre-flight information, aeronautical, information essential for safety, regularity and efficiency of air navigation and relative to the route stages originating at an aerodrome or heliport normally used for international air operations; and

- *(c)* ensure that arrangements are made to receive at aerodromes and heliports information concerning
 - (i) the state and operation of air navigation facilities noted by flight crews; and
 - the presence of birds observed by flight crews, and shall ensure that such information is made available to the aeronautical service for distribution as the circumstances necessitate.

Telecommunic ations requirements. Schedule 8 Part G.

Electronic

terrain and

Schedule 8 Part H.

obstacle data.

44. The Director General shall ensure that the telecommunication requirements applicable to aeronautical information services are in accordance with the standards prescribed in Part G of Schedule 8.

45. The Director General shall ensure that the electronic terrain and obstacle data related to the area of responsibility for Guyana by mutual agreement with signatory States to the regional air navigation agreement are in accordance with the standards prescribed in Part H of Schedule 8.

PART VII AERONAUTICAL CHARTS

Availability and general specifications of aeronautical charts. Schedule 16 Part A.

46. (1) The Authority shall ensure that the general specification, applicability and availability of aeronautical charts for use in air navigation in the area of responsibility for Guyana are in accordance with the standards prescribed in Part A of Schedule 16.

(2) The Authority shall, where so specified, ensure the availability of charts for a particular chart or single sheet of a chart series —

- (a) entirely contained within Guyana or areas for which the Authority is responsible under the regional arrangement by —
 - (i) producing the chart or sheet itself;
 - (ii) arranging for production by another Contracting State or by an agency; or
 - (iii) providing another Contracting State that is prepared to accept an obligation to produce the chart or sheet with the data necessary for its production; and
- (b) which includes the territory of two or more Contracting States of which the Authority has jurisdiction and under regional air navigation agreements, the Authority shall determine the manner in which the chart or sheet will be made available.

(3) The Authority shall take all reasonable measures to ensure that the information it provides and the aeronautical charts made available are adequate and accurate and that the information and aeronautical charts are maintained up to date by an adequate revision service.

(4) The aeronautical charts under this Part shall be the types recommended by ICAO.

47. The Authority shall on request by another Contracting State, provide all information relating to Guyana that is necessary to enable the standards of Schedule 16 to be met.

Authority's responsibility to provide information to other Contracting States. Schedule 16.

| Quality system for | 48. The Auth | nority shall— |
|--|---|--|
| aeronautical data. Schedule 8 Part A. | (a) | take all necessary measurements to introduce a properly organised quality system that contains procedures, processes and resources necessary to implement quality management at each function stage as outlined in Part A of Schedule 8, for the receipt, origination, collation, assembly, editing, formatting, publication, storage and distribution of aeronautical data for Guyana and other areas of responsibility for air traffic services outside Guyana; |
| | (b) | ensure that the established procedures exist in order that aeronautical data at any moment is traceable to its origin so as to allow any data anomalies or errors, detailed through the production and maintenance phases or in the operational use, to be corrected; |
| Schedule 22. | (c) | ensure that the order of chart resolution of aeronautical data shall be as specified for a particular chart as presented in a tabular form in Schedule 22; and |
| | (d) | ensure that integrity of aeronautical data is maintained through the data process from survey or origin to the next intended user. |
| The Authority to make available Aerodrome | 49. (1) The A Obstacle Chart—ICA made available in the | AUTOR A (Operating Limitations) are manner prescribed in regulation 45 for all word for international aviation except for |

available Aerodrome Obstacle Chart – ICAO Type A (Operating Limitations). **49.** (1) The Authomy shall ensure that Aerodrome Obstacle Chart—ICAO Type A (Operating Limitations) are made available in the manner prescribed in regulation 45 for all aerodromes regularly used for international aviation except for those aerodromes where there are no obstacles in the take-off flight path areas or where the Aerodrome Terrain and Obstacle Chart – ICAO (Electrical) is provided in accordance with regulation 58;

(2) Notwithstanding sub-regulation (1), an aerodrome obstacle chart, shall not be required where no obstacles exist in the take-off flight path area and a notification to that effect shall be published in the AIP.

(3) An aeronautical obstacle chart under subregulation (1), shall meet the standards prescribed in Part B of Schedule 16.

| The Authority to make available En | 50. (1) The Authority shall ensure that <i>en route</i> Charts—ICAO— |
|--|---|
| Route Charts – | |
| ICAO. | (a) are made available in the manner |
| | prescribed in regulation 45 for the |
| | Georgetown Flight Information Region |
| | to provide flight crew with information |
| | to facilitate navigation along ATS routes; |
| | and |
| | |

| Schedule 16 | (b) | meet the requirements of the standards |
|-------------|-----|--|
| Part C. | | prescribed in Part C of Schedule 16. |

(2) The Authority shall provide separate *en route* Charts—ICAO where different ATS routes, position reporting requirement or lateral limit of flight information regions or controlled areas exist in different layers and cannot be shown with sufficient clarity on one (1) chart.

 The Authority to make
 51. The Authority shall ensure —

 available Area
 (a) where air traffic services routes or position reporting requirements are complex and cannot be adequately

- shown on an En route Chart—ICAO an Area Chart—ICAO is made available in the manner prescribed in regulation 45;
- (*b*) that Area Charts—ICAO required to provide flight crew with the required information to facilitate the following phases of instrument flight:
 - (i) the transition between the *en route* phase and approach to an aerodrome;
 - (ii) the transition between take-off and missed approach and *en route* phase of flight; and
Schedule 16 Part D.

The Authority to make available standards departure charts – Instrument (SID) – ICAO. Schedule 16 Part E.

The Authority to make available Standard Arrival Chart – Instrument (STAR) – ICAO.

Schedule 16 Part F.

The Authority54. (1) Theto makeApproaavailableInstrumentApproach(aChart – ICAO.Instrument

- (iii) flight through areas of complex ATS routes or airspace structure, meet the requirements prescribed in Part D of Schedule 16; and
- (c) where ATS routes or position reporting requirements are different for arrivals and departures and cannot be shown with sufficient clarity on one chart, separate charts are provided.
- **52.** (1) The Authority shall ensure that the standard departure charts (Instrument SID)—ICAO—
 - (*a*) required to provide flight crew with information to enable compliance with the designated standard instrument departure route from take-off phase to the *en route* phase, meet the standards prescribed in Part E of Schedule 16; and
 - (*b*) are made available where a standard departure route instrument is established and cannot be shown with sufficient clarity on the Area Chart—ICAO.
- **53.** The Authority shall ensure that the Standard Arrival Chart (Instrument STAR)—ICAO—
 - (*a*) required to provide flight crew with information to enable compliance with the designated standard arrival route instrument from the *en route* phase to the approach phase, meet the standards prescribed in Part F of Schedule 16; and
 - (*b*) are made available where a standard arrival route instrument has been established and cannot be shown with sufficient clarity on the area chart.
- **54.** (1) The Authority shall ensure that Instrument Approach Chart—ICAO—
 - (*a*) required to provide flight crews with information to enable them to perform an

approved instrument procedure to the runway of intended landing including the missed approach procedure and where applicable, associated holding patterns, meet the standards prescribed in Part G of Schedule 16; and

- (*b*) are made available for all aerodromes used for international civil aviation where instrument approach procedures have been established by the Authority.
- (2) The Authority shall—
 - (a) provide a separate Instrument Approach Chart—ICAO for each precision and non-precision approach procedure established by the Authority;
 - (b) provide more than one Instrument Approach Chart—ICAO where the values for track, time or altitude differ between categories of aircraft on other than final approach segment of the instrument approach procedures and the listing of those differences on a single chart could cause clutter or confusion; and
 - (c) ensure that Instrument Approach Chart—ICAO are revised where information essential to safe operation becomes out of date.
- **55.** The Authority shall ensure that Visual App-roach Charts—ICAO—
 - (a) required to provide flight crews with information to enable them to transit from the *en route* and descent to approach phases of flight to the runway of intended landing by means of visual reference, meet the standards prescribed in Part H of Schedule 16; and
 - (*b*) are made available in the manner prescribed in regulation 45 for all

to make available Visual Approach Chart – ICAO.

The Authority

Schedule 16 Part H.

Schedule 16 Part G. aerodromes used for international civil aviation where—

- (i) only limited navigation facilities are available;
- (ii) no adequate aeronautical charts at the aerodrome and its surroundings at 1:500 000 or greater scale are available; or
- (iii) visual approach procedures have been established.
- **56.** The Authority shall ensure that Aerodrome or Heliport Charts—ICAO required to provide flight crews with essential operational information—
 - (a) to facilitate ground movement of aircraft—
 - (i) from the aircraft stand to the runway; and
 - (ii) from the runway to the aircraft stand; meet the standards prescribed in Part I of Schedule 16; and
 - (b) to facilitate helicopter movement
 - (i) from the helicopter stand to the touchdown and lift-off area and to the final approach and takeoff area;
 - (ii) from the final approach and take-off area to the touchdown and lift-off area and to the helicopter stand; and
 - (iii) along air transit routes, meet the standards prescribed in Part I of Schedule 16.

The Authority to make available Aerodrome or Heliport Charts.

Schedule 16 Part I.

Schedule 16 Part I.

| (c) | are | made | av | ailable | in | the | man | ner |
|-----|--|--------|----|---------|------|-----|-----|-----|
| | pres | cribed | in | regula | tion | 45 | for | all |
| | aerodromes or heliports regularly used for international civil aviation. | | | | | | | |
| | | | | | | | | |

- **57.** The Authority shall ensure that Aeronautical Chart ICAO 1: 000 000
 - (*a*) is made available in the manner prescribed in regulation 45 for Guyana; and
 - (b) provides the necessary information to satisfy the requirements of visual air navigation for low speed, short or medium-range operations at low and intermediate altitudes and meet the standards prescribed in Part J of Schedule 16.
- **58.** The Authority shall ensure that Aerodrome Terrain and Obstacle Chart ICAO (Electronic)
 - (a) is made available in the manner prescribed in regulation 45 for all aerodromes regularly used by international civil aviation from 18th November, 2010; and
 - (*b*) portrays the terrain and obstacle data in combination with aeronautical data and meet the standards prescribed in Part K of Schedule 16.

PART VIII AERONAUTICAL METEOROLOGY

Preliminary

| Application. | 59. This Part deals with Civil Aviation (Meteorology Services for Air Navigation). |
|-----------------|---|
| Interpretation. | 60. In this Part unless the context otherwise requires – |
| | (a) "aerodrome climatological summary" |

The Authority to make available Aeronautical Chart – ICAO 1: 000 000. Schedule 21.

Schedule 16 Part J.

The Authority to make available Aerodrome Terrain and Obstacle Chart – ICAO (Electronic).

Schedule 16 Part K. means a concise summary of specified meteorological elements at an aerodrome, based on statistical data;

- (b) "aerodrome climatological table" means a Table providing statistical data on the observed occurrence of one or more meteorological elements at an aerodrome;
- (c) "aerodrome meteorological office" means an office designated to provide meteorological service for aerodromes serving l air navigation;
- (d) "aeronautical fixed telecommunication network (AFTN)" means a worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages or digital data between aeronautical fixed stations having the same or compatible communications characteristics;
- (e) "aeronautical meteorological station" means a station designated to make observations and meteorological reports for use in l air navigation;
- (f) "aircraft" means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface;
- (g) "aircraft observation" means the evaluation of one or more meteorological elements made from an aircraft in flight;
- (h) "air-report" means a report from an aircraft in flight prepared in conformity with requirements for position, and operational or meteorological reporting;
- (i) "briefing" means oral

commentary on existing or expected meteorological conditions;

- (j) "cloud of operational significance" means a cloud with the height of cloud base below 1500 m (5000 ft) or below the highest minimum sector altitude, whichever is greater, or a cumulonimbus cloud or a towering cumulus cloud at any height;
- (k) "consultation" means discussion with a meteorologist or another qualified person of existing or expected meteorological conditions relating to flight operations and a discussion includes answers to questions;
- (l) "extended range operation" means any flight by an aeroplane with two turbine engines where the flight time at the oneengine inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator;
- (m) "flight documentation" means written or printed documents, including charts or forms, containing meteorological information for a flight;
- (n) "GAMET area forecast" means an area forecast in abbreviated plain language for low-level flights for a flight information region or sub-area thereof, prepared by the meteorological office designated by the meteorological service provider concerned and exchanged with meteorological offices in adjacent flight information regions, as agreed between the meteorological authorities concerned;
- (o) "Grid point data in digital form" means Computer processed meteorological

data for a set of regularly spaced points on a chart, for transmission from a meteorological computer to another computer in a code form suitable for automated use;

Note. — In most cases, such data are transmitted on medium- or high- speed telecommunications channels.

 (p) "International Airways Volcano Watch (IAVW)" means International arrangements for monitoring and providing warnings to aircraft of volcanic ash in the atmosphere;

Note.— The IAVW is based on the cooperation of aviation and non- aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organisations.

- (q) "meteorological bulletin" means a text comprising meteorological information preceded by an appropriate heading;
- (r) "meteorological information" means meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions;
- (s) "meteorological report" means a statement of observed meteorological conditions related to a specified time and location;
- (t) "meteorological satellite" means an artificial Earth satellite making meteorological observations and transmitting these observations to Earth;
- (u) "observation (meteorological)" means

the evaluation of one or more meteorological elements;

- (v) "operational control" means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight;
- (w) "operational flight plan" means the operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned;
- (x) "operational planning" means the planning of flight operations by an operator;
- (y) "prevailing visibility" means the greatest visibility value, observed in accordance with the definition of "visibility", which is reached within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors;

Note. — This value may be assessed by human observation and/or instrumented systems. When instruments are installed, they are used to obtain the best estimate of the prevailing visibility.

- (z) "prognostic chart" means a forecast of a specified meteorological element(s) for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart;
- (aa) "Regional Air Navigation Agreement" means an Agreement approved by the Council of ICAO normally on the advice

of a regional air navigation meeting;

- (bb) "Search and rescue services unit" means a generic term meaning, as the case may be, rescue coordination centre, rescue sub centre or alerting post;
- (cc) "service provider" means the meteorological authority providing or arranging for the provision of meteorological service for air navigation;
- (dd) "standard isobaric surface" means an isobaric surface used on a worldwide basis for representing and analysing the conditions in the atmosphere;
- (ee) "tropical cyclone" means generic term for a non-frontal synoptic-scale cyclone originating over tropical or sub-tropical waters with organised convection and definite cyclonic surface wind circulation;
- (ff) "Tropical Cyclone Advisory Centre (TCAC)" means a meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, world area forecast centres and international OPMET databanks regarding the position, forecast direction and speed of movement, central pressure and maximum surface wind of tropical cyclones;
- (gg) "upper-air chart" means a meteorological chart relating to a specified upper- air surface or layer of the atmosphere.;
- (hh) "visibility" means visibility for aeronautical purposes is the greater of:
 - i. the greatest distance at which a black object of suitable

dimensions, situated near the ground, can be seen and recognised when observed against a bright background;

ii. the greatest distance at which lights in the vicinity of 1 000 candelas can be seen and identified against an unlit background;

> Note. — The two distances have different values in air of a given extinction coefficient, and the latter b) varies with the background illumination. The former a) is represented by the meteorological optical range (MOR).

- "Volcanic Ash Advisory (ii) Centre (VAAC)" means a meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, area control centres, flight information centres, world area forecast centres and international OPMET databanks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions;
- (jj) "VOLMET" means meteorological information for aircraft in flight;
- (kk) "Data link-VOLMET(D-VOLMET)" means 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; and
- (ll) "World Area Forecast Centre (WAFC)" means a meteorological centre designated to prepare and issue

significant weather forecasts and upperair forecasts in digital form on a global basis direct to States by appropriate means as part of the aeronautical fixed service.

Application of (1) This Part shall apply to a person providing 61. this Part. meteorological services for air navigation services within designated air spaces and at aerodromes. (2) This Part shall not apply to a person providing air navigation services in the course of his duties for state aircraft. Provision of Meteorology Services for Air Navigation Authority to 62. A person shall not provide Meteorology services for provide air navigation unlessmeteorology services for air (a) such person has been so authorised by navigation. the Government of Guyana; and (b) the services are provided in accordance with the requirements prescribed in these Regulations and any associated standards and procedures Procedures for A person authorised to provide meteorology services 63. provision of for air navigation under regulation 62 shall do so in accordance services. with the procedures described in -(a) the Manual of Operations required under these Regulations; and (b) the quality management system manual required under these Regulations. Obligations of (1) The provider of meteorology services for air **64**. the services navigation shall, before providing the services, be satisfied provider. that-(a) the personnel are adequate in number and have the necessary competency to provide the service;

(b) the Manual of Operations contains all the relevant information;

- (c) the facilities, services and equipment are established in accordance with these Regulations;
- (d) the operating procedures make satisfactory provision for the safety of aircraft;
- (e) an approved quality management system is in place;
- (f) the person has financial capability to provide the service; and
- (g) the applicant has insurance policy in force in relation to the services provided. *Preparation of the Manual of Operations*

Requirements **65.** (1) The Manual of Operations required under these of Operations. Regulations shall be —

- (a) type written;
- (b) signed by the service provider;
- (c) in a format that is easy to revise and includes a list of effective pages; and
- (d) organised in a manner that facilitates evaluation and approval processes.

(2) A service provider shall submit two copies of the Manual of Operations to the Authority for acceptance and approval.

(3) A service provider shall keep at least one approved copy of the manual at the principal place of business.

Contents of the Manual of Operations. **66.** A Manual of Operations, shall contain all information and instructions necessary to enable the personnel of services provider to perform their duties and in particular shall include—

- (a) services to be provided;
- (b) personnel requirements and their responsibilities;
- (c) training and performance assessment of

staff and how that information is tracked;

- (d) Quality Management System;
- (e) contingency plans developed for part or total system failure;
- (f) facilities and equipment and how they are installed and maintained;
- (g) fault and defect reporting;
- (h) maintenance of documents and records;
- search and rescue responsibilities and co-ordination, operations, plan and procedures;
- (j) the proposed hours of service;
- (k) systems and procedures in the provision of Meteorological Services for Air Navigation Service; and
- (l) any other information requested by the Authority.

67. (1) For the purposes of maintaining the accuracy of the information in the Manual of Operations, the service provider shall whenever necessary, amend the manual and keep the manual updated and shall submit the said amendments to the Authority for acceptance.

(2) Notwithstanding the provisions of sub- regulation (1), the holder of a certificate shall submit the proposed amendment to the Authority for approval, before the manual is amended.

General Provisions for Meteorology Services for Air Navigation

Objective, determination and provision of meteorology

68. (1) The objective of meteorological service for air navigation shall be to contribute towards the safety, regularity and efficiency of air navigation.

Amendment of the Manual of Operations. (2) This objective shall be achieved by supplying the following users with the meteorological information necessary for the performance of their respective functions:

- (*a*) operators, flight crew members;
- (*b*) air traffic services units;
- (c) search and rescue services units;
- (d) airport managements; and
- (e) Others concerned with the conduct or development of international air navigation.

(3) The meteorological services provided shall be provided in accordance with these Regulations and associated technical standards to meet the needs of international air navigation.

(4) Notwithstanding sub-regulation (3), the service provider shall determine the meteorological services to be provided in accordance with the provisions of these Regulations and regional air navigation agreements and shall include the determination of the meteorological service to be provided for international air navigation over international waters and other areas which lie outside the territory of Guyana

69. The meteorology services provider shall –

- (a) comply with the requirements of the World Meteorological Organisation in respect of qualifications and training of meteorological personnel providing services for international air navigation and other requirements as may be prescribed by the Authority;
- (b) establish a procedure to assess the competency of personnel authorised to install meteorological facility for operational use and to perform meteorological services;
- (c) maintain the competence of the personnel authorised to provide the services.

Personnel qualification and training.

service.

70. (1) Close liaison shall be maintained between those concerned with the supply and those concerned with the use of meteorological information on matters which affect the meteorological provision of meteorological service for international air navigation.

Supply, use

and quality

of

management

information.

Authority The shall ensure that the (2) Meteorological services provider establishes and implements a properly organised quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to users.

(3) The quality system established in accordance with sub-regulation (2) shall be in conformity with the International Organisation for Standardisation (ISO) 9000 series of quality assurance standards and shall be certified by an approved organisation.

(4) The quality system shall provide the users with assurance that the meteorological information supplied complies with the stated requirements in terms of the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity, as well as the accuracy of measurements, observations and forecasts.

(5) When the quality system indicates that meteorological information to be supplied to the users does not comply with the stated requirements, and automatic error correction procedures are not appropriate, such information shall not be supplied to the users unless it is validated with the originator.

(6) In regard to the exchange of meteorological information for operational purposes, the quality system shall include verification and validation procedures and resources for monitoring adherence to the prescribed transmission schedules for individual messages or bulletins required to be exchanged, and the times of their filing for transmission.

(7) The quality system shall be capable of detecting excessive transit times of messages and bulletins received.

(8) Demonstration of compliance of the quality system applied shall be by audit and if non-conformity of the system is identified, action shall be initiated to determine and correct the cause.

(9) All audit observations shall be evidenced and properly documented.

(10) The meteorological information supplied to the users shall be consistent with Human Factors principles and shall be in forms which require a minimum of interpretation by these users.

Notifications required from operators. 71. (1) An operator requiring meteorological service or changes in existing meteorological service shall notify, sufficiently in advance, the service provider or the aerodrome meteorological office concerned.

> (2) The minimum amount of advance notice required shall be as agreed between the service provider or aerodrome meteorological office and the operator.

> (3) The service provider shall be notified by the operator requiring service when-

- (a) new routes or new types of operations are planned;
- (b) changes of a lasting character are to be made in scheduled operations; and
- (c) other changes, affecting the provision of meteorological service, are planned.

(4) Such information shall contain all details necessary for the planning of appropriate arrangements by the service provider.

(5) The operator or a flight crew member shall ensure that, where required by the service provider in consultation with users, the aerodrome meteorological office concerned is notified-

- (a) of flight schedules;
- (b) when non-scheduled flights are to be operated; and
- (c) when flights are delayed, advanced or cancelled.

(6) The notification to the aerodrome meteorological office of individual flights shall contain the following

information except that, in the case of scheduled flights, the requirement for some or all of this information may be waived by agreement between the aerodrome meteorological office and the operator:

- (a) aerodrome of departure and estimated time of departure;
- (b) destination and estimated time of arrival;
- (c) route to be flown and estimated times of arrival at, and departure from, any intermediate aerodrome;
- (d) alternate aerodromes needed to complete the operational flight plan and taken from the relevant list contained in the regional air navigation plan;
- (e) cruising level;
- (f) type of flight, whether under visual or instrument flight rules;
- (g) type of meteorological information requested for a flight crew member, whether flight documentation or briefing or consultation; and
- (h) time at which briefing, consultation or flight documentation are required.

World Area Forecast System and Meteorological Offices

Objective of the world area forecast system.

World area

forecast

centres.

72. (1) The objective of the world area forecast system shall be to supply meteorological authorities and other users with global aeronautical meteorological en-route forecasts in digital form.

(2) This objective shall be achieved through a comprehensive, integrated, worldwide and, as far as practicable, uniform system, and in a cost effective manner, taking full advantage of evolving technologies.

73. (1) The meteorological service provider shall ensure that the following information from the WAFC is provided to all Air Traffic Services Units-

(a) gridded global forecasts of-

- (i) upper wind;
- (ii) upper-air temperature and humidity;

- (iii) geopotential altitude of flight levels;
- (iv) flight level and temperature of tropopause;
- (v) direction, speed and flight level of maximum wind;
- (vi) cumulonimbus clouds;
- (vii) icing; and
- (viii) turbulence;
- (b) to prepare global forecasts of significant weather (SIGWX) phenomena;
- (c) to issue the forecasts referred to in (a) and (b) in digital form to meteorological services and other users, as approved by the Authority on advice from the service provider;
- (d) to receive information concerning the release of radioactive materials into the atmosphere from its associated WMO regional specialised meteorological centre (RSMC) for the provision of transport model products for radiological environmental emergency response, in order to include the information in SIGWX forecasts: and
- (e) to establish and maintain contact with VAACs for the exchange of information on volcanic activity in order to coordinate the inclusion of information on volcanic eruptions in SIGWX forecasts.

(2) In case of interruption of the operation of a WAFC, its functions shall be carried out by the other WAFC.

Aerodrome (1) The meteorological service provider shall 74. meteorological establish one or more aerodrome and/or other meteorological offices which shall be adequate for the provision of the meteorological service required to satisfy the needs of 1 air navigation.

offices.

(2) An aerodrome meteorological office shall carry out all or some of the following functions as necessary to meet the needs of flight operations at the aerodrome-

- (a) prepare or obtain forecasts and other relevant information for flights with which it is concerned; the extent of its responsibilities to prepare forecasts shall be related to the local availability and use of en-route and aerodrome forecast material received from other offices;
- (b) prepare or obtain forecasts of local meteorological conditions;
- (c) maintain a continuous survey of meteorological conditions over the aerodromes for which it is designated to prepare forecasts;
- (d) provide briefing, consultation and flight documentation to flight crew members or other flight operations personnel;
- (e) supply other meteorological information to aeronautical users;
- (f) display the available meteorological information;
- (g) exchange meteorological information with other aerodrome meteorological offices; and
- (h) supply information received on preeruption volcanic activity, a volcanic eruption or volcanic ash cloud, to its associated air traffic services unit, aeronautical information service unit and meteorological watch office as agreed between the meteorological, aeronautical information service and ATS authorities concerned.

(3) The aerodromes for which landing forecasts are required shall be determined by regional air navigation agreement.

(4) For an aerodrome without an aerodrome meteorological office located at the aerodrome-

 (a) the meteorological service provider shall designate one or more aerodrome meteorological office(s) to supply meteorological information as required; and

(*b*) shall establish means by which such information can be supplied to the aerodromes concerned.

75. (1) The meteorological services provider, having accepted the responsibility for providing meteorological services for air navigation in Guyana shall establish, on the basis of regional air navigation agreement, one or more meteorological watch offices.

(2) A meteorological watch office shall:

- (a) maintain continuous watch over meteorological conditions affecting flight operations within its area of responsibility;
- (b) prepare SIGMET and other information relating to its area of responsibility;
- (c) supply SIGMET information and, as required, other meteorological information to associated air traffic services units;
- (d) disseminate SIGMET information;
- (e) when required by regional air navigation agreement-
 - (i) prepare AIRMET information related to its area of responsibility
 - (ii) supply AIRMET information to associated air traffic services units; and
 - (iii) disseminate AIRMET information;
- (f) supply information received on preeruption volcanic activity, a volcanic eruption and volcanic ash cloud for which a SIGMET has not already been issued, to its associated ACC/FIC, as agreed between the meteorological and ATS authorities concerned, and to its associated VAAC as determined by a Regional Air Navigation Agreement; and
- (g) supply information received

Meteorological watch offices.

concerning the release of radioactive materials into the atmosphere, in the area for which it maintains watch or adjacent areas, to its associated ACC/FIC, as agreed between the meteorological and ATS authorities concerned, and to aeronautical information service units, as agreed between the meteorological and appropriate civil aviation authorities concerned and such information shall comprise location, date and time of the release, and forecast of the radioactive trajectories materials.

(3) The boundaries of the area over which meteorological watch is to be maintained by a meteorological watch office shall be coincident with the boundaries of a flight information region or a control area or a combination of flight information regions or control areas.

Receipt of volcanic information. **76.** Where there are active or potentially active volcances the meteorological service provider shall arrange to receive information from the VAAC as designated by the Regional Air Navigation Agreement.

Meteorological Observations and Reports

77. (1) The meteorological service provider shall establish, at aerodromes, such aeronautical meteorological stations as it determines to be necessary and an aeronautical meteorological station may be a separate station or may be combined with a synoptic station.

(2) The meteorological service provider shall establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of helicopter operations to offshore structures, if required by the Regional Air Navigation Agreement.

(3) Aeronautical meteorological stations shall make routine observations at fixed intervals and at aerodromes, the routine observations shall be supplemented by special observations whenever specified changes occur in respect of

Aeronautical meteorological stations and observations. surface wind, visibility, runway visual range, present weather, clouds or air temperature.

(4) The meteorological service provider shall arrange for its aeronautical meteorological stations to be inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly

(5) At aerodromes with runways intended for ILS approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations.

(6) These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations.

(7) The design of integrated automatic systems shall observe Human Factors principles and include back-up procedures.

(8) Where an integrated semi-automatic system is used for the dissemination or display of meteorological information, it shall be capable of accepting the manual insertion of data covering those meteorological elements which cannot be observed by automatic means.

(9) The observations shall form the basis for the preparation of reports to be disseminated at the aerodrome of origin and of reports to be disseminated beyond the aerodrome of origin.

(10) Owing to the variability of meteorological elements in space and time, to limitations of observing techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a report shall be understood by the recipient to be the best approximation to the actual conditions at the time of observation.

78. An agreement between the meteorological services provider and the appropriate ATS authority shall be traffic services established to cover, amongst other things-

- (a) the provision in air traffic services units of displays related to integrated automatic systems;
- (b) the calibration and maintenance of these displays or instruments;
- (c) the use to be made of these displays or instruments by air traffic services personnel;
- (d) as and where necessary, supplementary visual observations (for example, of meteorological phenomena of operational significance in the climb-out and approach areas) if and when made by air traffic services personnel to update or supplement the information supplied by the meteorological station;
- (e) meteorological information obtained from aircraft taking off or landing (for example, on wind shear); and
- (f) if available, meteorological information obtained from ground weather radar.

Routine observations and reports.

Agreement

between air

provider and meteorological services

provider.

79. (1) At aerodromes, routine observations shall be made throughout the twenty-four hours each day, except as otherwise agreed between the service provider, the appropriate ATS authority and the operator concerned and such observations shall be made at intervals of one hour or, if so determined by regional air navigation agreement, at intervals of one half-hour.

(2) At other aeronautical meteorological stations, such observations shall be made as determined by the service provider taking into account the requirements of air traffic services units and aircraft operations.

(3) Reports of routine observations shall be issued as-

(a) local routine only for reports, dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and

(b) METAR for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET).

(4) At aerodromes that are not operational throughout twenty-four hours, METAR shall be issued prior to the aerodrome resuming operations.

Special observations and reports.

80. (1) A list of criteria for special observations shall be established by the service provider, in consultation with the appropriate ATS authority, operators and others concerned.

(2) Reports of special observations shall be issued as-

- (a) local special reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and
- (b) SPECI for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET) unless METAR are issued at half-hourly intervals.

(3) At aerodromes that are not operational throughout twenty-four hours, following the resumption of the issuance of METAR, SPECI shall be issued, as necessary.

Contents of
reports.81. (1) Local routine and special reports and METAR and
SPECI shall contain the following elements in the order
indicated-

- (a) identification of the type of report;
- (b) location indicator;
- (c) time of the observation;
- (d) identification of an automated or missing report, when applicable;
- (e) surface wind direction and speed;
- (f) visibility;
- (g) runway visual range, when applicable;
- (h) present weather;
- (i) cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or,

where measured, vertical visibility;

- (j) air temperature and dew-point temperature; and
- (k) QNH and, when applicable, QFE (QFE included only in local routine and special reports).

(2) In addition to elements listed under subregulation (1) (a) to (k), local routine and special reports and METAR and SPECI shall contain supplementary information to be placed in paragraph (k).

Observing and reporting meteorological elements. **82.** (1) (a) The mean direction and the mean speed of the surface wind shall be measured, as well as significant variations of the wind direction and speed, and reported in degrees true and metres per second (or knots), respectively.

- (b) When local routine and special reports are used for departing aircraft, the surface wind observations for these reports shall be representative of conditions along the runway and when local routine and special reports are used for arriving aircraft, the surface wind observations for these reports shall be representative of the touchdown zone.
- (c) For METAR and SPECI, the surface wind observations shall be representative of conditions above the whole runway where there is only one runway and the whole runway complex where there is more than one runway.

(2) (a) The visibility as defined in regulation 60 of this Part, shall be measured or observed, and reported in metres or kilometres;

(b) When local routine and special reports are used for departing aircraft, the visibility observations for these reports shall be representative of conditions along the runway and when local routine and special reports are used for arriving aircraft, the visibility observations for these reports shall be representative of the touchdown zone of the runway.

(c) For METAR and SPECI, the visibility

observations shall be representative of the aerodrome.

(3) (a) Runway visual range as defined in Chapter 1 shall be assessed on all runways intended for Category II and III instrument approach and landing operations.

(b) Runway visual range as defined in Chapter 1 shall be assessed on all runways intended for use during periods of reduced visibility, including-

- (i) precision approach runways intended for Category I instrument approach and landing operations; and
- (ii) runways used for take-off and having high-intensity edge lights or centre line lights.

(c) The runway visual range, shall be reported in metres throughout periods when either the visibility or the runway visual range is less than 1500 m.

(d) Runway visual range assessments shall be representative of-

- (i) the touchdown zone of the runway intended for nonprecision or Category I instrument approach and landing operations;
- (ii) the touchdown zone and the mid-point of the runway intended for Category II instrument approach and landing operations; and
- (iii) the touchdown zone, the midpoint and stop-end of the runway intended for Category III instrument approach and landing operations.
- (e) The units providing air traffic service and

aeronautical information service for an aerodrome shall be kept informed without delay of changes in the serviceability status of the automated equipment used for assessing runway visual range.

(4) (a) The present weather occurring at the aerodrome shall be observed and reported as necessary and the following present weather phenomena shall be identified as a minimum: rain, drizzle, haze, mist, fog, and thunderstorms (including thunderstorms in the vicinity).

(b) For local routine and special reports, the present weather information shall be representative of conditions at the aerodrome.

(c) For METAR and SPECI, the present weather information shall be representative of conditions at the aerodrome and, for certain specified present weather phenomena, in its vicinity.

(5) (a) Cloud amount, cloud type and height of cloud base shall be observed and reported as necessary to describe the clouds of operational significance. When the sky is obscured, vertical visibility shall be observed and reported where measured, in lieu of cloud amount, cloud type and height of cloud base and the height of cloud base and vertical visibility shall be reported in metres (or feet).

(b) Cloud observations for local routine and special reports shall be representative of the runway threshold(s) in use.

(c) Cloud observations for METAR and SPECI shall be representative of the aerodrome and its vicinity.

(6) (a) The air temperature and the dew-point temperature shall be measured and reported in degrees Celsius.

(b) Observations of air temperature and dewpoint temperature for local routine and special reports and METAR and SPECI shall be representative of the whole runway complex.

(7) The atmospheric pressure shall be measured, and QNH and QFE values shall be computed and reported in hectopascals.

(8) Observations made at aerodromes shall include the available supplementary information concerning significant meteorological conditions, particularly those in the approach and climb-out areas and where practicable, the information shall identify the location of the meteorological condition.

Reporting meteorological information from automatic observing systems.

83. (1) METAR and SPECI from automatic observing systems shall be used during non-operational hours of the aerodrome, and during operational hours of the aerodrome as determined by the service provider in consultation with users based on the availability and efficient use of personnel.

(2) Local routine and special reports and METAR and SPECI from automatic observing systems shall be identified with the word "AUTO".

Observations and reports of volcanic activity. **84.** (1) The occurrence of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud shall be reported without delay to the associated air traffic services unit, aeronautical information services unit and meteorological watch office.

(2) The report shall be made in the form of a volcanic activity report comprising the following information in the order indicated-

- (a) message type, volcanic activity report;
- (b) station identifier, location indicator or name of station;
- (c) date and time of message;
- (d) location of volcano and name if known; and
- (e) concise description of event including, as appropriate, level of intensity of volcanic activity, occurrence of an eruption and its date and time, and the existence of a volcanic ash cloud in the area together with direction of ash cloud movement and height.

Aircraft Observations and Reports

| Obligations of | 85. | The | Authority | shall | arrange, | according | to | the | |
|----------------|--|-----|-----------|-------|----------|-----------|----|-----|--|
| the Authority. | provisions of these Regulations, for observations to be made by | | | | | | | | |
| | aircraft of its registry operating on international air routes and | | | | | | | | |
| | for the recording and reporting of these observations. | | | | | | | | |

Types of
aircraft
observations.86. The following aircraft observations shall be made-
aircraft
(a) routine aircraft observations during en-

- (a) routine aircraft observations during enroute and climb-out phases of the flight; and
- (*b*) special and other non-routine aircraft observations during any phase of the flight.

Routine aircraft observations designation. **87.** (1) When air-ground data link is used and automatic dependent surveillance (ADS) or Secondary surveillance radar (SSR) Mode S is being applied, automated routine observations shall be made every 15 minutes during the en-route phase and every 30 seconds during the climb-out phase for the first 10 minutes of the flight.

(2) For helicopter operations to and from aerodromes on offshore structures, routine observations shall be made from helicopters at points and times as agreed between the meteorological authorities and the helicopter operators concerned.

(3) In the case of air routes with high-density air traffic (e.g. organised tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with these regulations

(4) The designation procedures shall be subject to a Regional Air Navigation Agreement.

(5) In the case of the requirement to report during the climb-out phase, an aircraft shall be designated, at approximately hourly intervals, at each aerodrome to make routine observations in accordance with these Regulations.

Routine
aircraft
observations88. Aircraft not equipped with air-ground data link shall
be exempted from making routine aircraft observations.- exemptions.

Special aircraft observations. 89. Special observations shall be made by all aircraft whenever the following conditions are encountered or observed-

- (a) moderate or severe turbulence; or
- (b) moderate or severe icing; or
- (c) severe mountain wave; or
- (d) thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or
- (e) thunderstorms, with hail, that are obscured, embedded, widespread or in squall lines; or
- (f) heavy dust storm or heavy sandstorm; or
- (g) volcanic ash cloud; or
- (h) pre-eruption volcanic activity or a volcanic eruption.

90. When other meteorological conditions not listed under regulation 100, e.g. wind shear, are encountered and which, in the opinion of the pilot-in- command, may affect the safety or markedly affect the efficiency of other aircraft operations, the pilot-in-command shall advise the appropriate air traffic services unit as soon as practicable.

91. (1) Aircraft observations shall be reported by airground data link and where air-ground data link is not available or appropriate, special and other non-routine aircraft observations during flight shall be reported by voice communications.

(2) Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable and aircraft observations shall be reported as air-reports.

Relay of airreports by air traffic services units. **92.** The meteorological services provider concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of-

- (a) special air-reports by voice communications, the air traffic services units relay them without delay to their associated meteorological watch office; and
- (b) routine and special air-reports by data

Other nonroutine aircraft observations.

Reporting of aircraft observations during flight. link communications, the air traffic services units relay them without delay to their associated meteorological watch office and WAFCs.

Recording and post-flight reporting of aircraft observations of volcanic activity. **93.** (1) Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air- report of volcanic activity form.

(2) A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of the service provider concerned, could be affected by volcanic ash clouds.

Forecasts

Interpretation and use of forecasts.

94. (1) Owing to the variability of meteorological elements in space and time, to limitations of forecasting techniques and to limitations caused by the definitions of some of the elements, the specific value of any of the elements given in a forecast shall be understood by the recipient to be the most probable value which the element is likely to assume during the period of the forecast and when the time of occurrence or change of an element is given in a forecast, this time shall be understood to be the most probable time.

(2) The issue of a new forecast by an aerodrome meteorological office, such as a routine aerodrome forecast, shall be understood to cancel automatically any forecast of the same type previously issued for the same place and for the same period of validity or part thereof.

Aerodrome forecasts.

95. (1) An aerodrome forecast shall be prepared, on the basis of regional air navigation agreement, by the aerodrome meteorological office designated by the service provider concerned.

(2) An aerodrome forecast shall be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period.

(3) Aerodrome forecasts and amendments thereto shall be issued as TAF and include the following information in the order indicated:

- (*a*) identification of the type of forecast;
- (b) location indicator;
- (c) time of issue of forecast;
- (*d*) identification of a missing forecast, when applicable;
- (e) date and period of validity of forecast;
- (*f*) identification of a cancelled forecast, when applicable;
- (g) surface wind;
- (*h*) visibility;
- *(i)* weather;
- (*j*) cloud; and
- (k) expected significant changes to one or more of these elements during the period of validity.

(4) Optional elements shall be included in TAF in accordance with a Regional Air Navigation Agreement

(5) Aerodrome meteorological offices preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly and the length of the forecast messages and the number of changes indicated in the forecast shall be kept to a minimum

(6) TAF that cannot be kept under continuous review shall be cancelled.

(7) The period of validity of a routine TAF shall be not less than six hours nor more than thirty hours and the period of validity shall be determined by a Regional Air Navigation Agreement.

(8) Routine TAF valid for less than twelve hours shall be issued every 3 hours and those valid for twelve to thirty hours shall be issued every six hours.

(9) When issuing TAF, aerodrome meteorological offices shall ensure that not more than one TAF is valid at an aerodrome at any given time.

96. (1) A landing forecast shall be prepared by the aerodrome meteorological office designated by the service provider concerned as determined by a Regional Air Navigation Agreement and such forecasts are intended to meet the requirements of local users and of aircraft within about one

Landing

forecasts.

hour's flying time from the aerodrome.

(2) Landing forecasts shall be prepared in the form of a trend forecast.

(3) A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at that aerodrome to be appended to a local routine or local special report, or a METAR or SPECI and the period of validity of a trend forecast shall be two hours from the time of the report which forms part of the landing forecast.

Forecasts for (1) A forecast for take-off shall be prepared by the 97. aerodrome meteorological office designated by the service provider concerned if required by agreement between the service provider and operators.

> (2) A forecast for take-off shall refer to a specified period of time and shall contain information on expected conditions over the runway complex in regard to surface wind direction and speed and any variations thereof, temperature, pressure (QNH), and any other elements as agreed locally.

> (3) A forecast for take-off shall be supplied to operators and flight crew members on request within the three hours before the expected time of departure.

> (4) Aerodrome meteorological offices preparing forecasts for take-off shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly.

98. (1) When the density of traffic operating below flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) warrants the routine issue and dissemination of area forecasts for such operations, the frequency of issue, the form and the fixed time or period of validity of those forecasts and the criteria for amendments thereto shall be determined by the service provider in consultation with the users.

(2) When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information, area forecasts for such operations shall be prepared in a format agreed upon between the meteorological authorities concerned.

take-off.

Area forecasts

for low-level

flights.

105

(3) When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, the forecast shall be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena.

(4) The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights.

(5) Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be issued every 6 hours for a period of validity of six hours and transmitted to meteorological watch offices and/or aerodrome meteorological offices concerned not later than one hour prior to the beginning of their validity period.

SIGMET Information, Aerodrome Warnings and Wind Shear Warnings and Alerts

99. (1) SIGMET information shall be issued by a meteorological watch office and shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, which may affect the safety of aircraft operations, and of the development of those phenomena in time and space.

SIGMET

information.

(2) SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

(3) The period of validity of a SIGMET message shall be not more than four hours. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, the period of validity shall be extended up to six hours.

(4) SIGMET messages concerning volcanic ash cloud and tropical cyclones shall be based on advisory information provided by VAACs and TCACs, respectively, designated by regional air navigation agreement.

(5) Close coordination shall be maintained between

the meteorological watch office and the associated area control centre/flight information centre to ensure that information on volcanic ash included in SIGMET and NOTAM messages is consistent.

(6) SIGMET messages shall be issued not more than four hours before the commencement of the period of validity. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, these messages shall be issued as soon as practicable but not more than twelve hours before the commencement of the period of validity and SIGMET messages for volcanic ash and tropical cyclones shall be updated at least every six hours.

100. (1) AIRMET information shall be issued by a meteorological watch office in accordance with regional air navigation agreement, taking into account the density of air traffic operating below flight level 100. AIRMET information shall give a concise description in abbreviated plain language concerning the occurrence or expected occurrence of specified en-route weather phenomena, which have not been included in Section 1 of the area forecast for low level flights issued in accordance with Regulation 98 and which may affect the safety of low-level flights, and of development of those phenomena in time and space.

(2) AIRMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

(3) The period of validity of an AIRMET message shall be not more than four hours.

Aerodrome warnings.

Airmet

Information.

101. (1) Aerodrome warnings shall be issued by the aerodrome meteorological office designated by the service provider concerned and shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services.

(2) Aerodrome warnings shall be cancelled when the conditions are no longer occurring or no longer expected to occur at the aerodrome.

Wind shear **102.** (1) Wind shear warnings shall be prepared by the aerodrome meteorological office designated by the service

provider concerned for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the appropriate air traffic services unit and operators concerned.

(2) Wind shear warnings shall give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or take-off path or during circling approach between runway level and 500 m (1 600 ft) above that level and aircraft on the runway during the landing roll or take-off run.

(3) Where local topography has been shown to produce significant wind shears at heights in excess of 500 m (1 600 ft) above runway level, then 500 m (1 600 ft) shall not be considered restrictive.

(4) Wind shear warnings for arriving aircraft or departing aircraft shall be cancelled when aircraft reports indicate that wind shear no longer exists or, alternatively, after an agreed elapsed time.

(5) The criteria for the cancellation of a wind shear warning shall be defined locally for each aerodrome, as agreed between the service provider, the appropriate ATS authority and the operators concerned.

(6) At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems shall be issued.

(7) Wind shear alerts shall give concise, up-to-date information related to the observed existence of wind shear involving a headwind or tailwind change of 7.5 m/s (15 kt) or more which could adversely affect aircraft on the final approach path or initial take-off path and aircraft on the runway during the landing roll or take-off run.

(8) Wind shear alerts shall be updated at least every minute and the wind shear alert shall be cancelled as soon as the headwind or tailwind change falls below 7.5 m/s (15 kt).

Aeronautical Climatological Information
103. (1) Aeronautical climatological information required for the planning of flight operations shall be prepared in the form of aerodrome climatological tables and aerodrome climatological summaries.

(2) Such information shall be supplied to aeronautical users as agreed between the service provider and those users.

(3) Aeronautical climatological information shall normally be based on observations made over a period of at least five years and the period shall be indicated in the information supplied.

(4) Climatological data related to sites for new aerodromes and to additional runways at existing aerodromes shall be collected starting as early as possible before the commissioning of those aerodromes or runways

Aerodrome climatological tables.

General

provisions.

104. The authority shall make arrangements for collecting and retaining the necessary observational data and have the capability-

- (a) to prepare aerodrome climatological tables for each regular and alternate international aerodrome within its territory; and
- (b) to make available such climatological tables to an aeronautical user within a time period as agreed between the service provider and that user.

Aerodrome climatological summaries.

105. (1) Aerodrome climatological summaries shall follow the procedures prescribed by the World Meteorological Organisation.

(2) Where computer facilities are available to store, process and retrieve the information, the summaries shall be published or otherwise made available to aeronautical users on request.

(3) Where such computer facilities are not available, the summaries shall be prepared using the models specified by the World Meteorological Organisation and shall be published and kept up to date as necessary.

106. The service provider, on request and to the extent meteorological practicable, shall make available to any other meteorological observational service provider, to operators and to others concerned with the application of meteorology to international air navigation, meteorological observational data required for research, investigation or operational analysis.

Service for Operators and Flight Crew Members

General provisions.

Copies of

data.

107. (1) Meteorological information shall be supplied to operators and flight crew members for-

- (a) pre-flight planning by operators;
- (b) in-flight replanning by operators using centralised operational control of flight operations;
- (c) use by flight crew members before departure; and
- (d) aircraft in flight.

(2) Meteorological information supplied to operators and flight crew members shall cover the flight in respect of time, altitude and geographical extent.

(3) Accordingly, the information shall relate to appropriate fixed times, or periods of time, and shall extend to the aerodrome of intended landing, also covering the meteorological conditions expected between the aerodrome of intended landing and alternate aerodromes designated by the operator.

(4) Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as established by the service provider in consultation with operators concerned-

(a) forecasts of:

- (i) upper wind and upper-air temperature;
- (ii) upper-air humidity;
- (iii) geopotential altitude of flight levels;
- (iv) flight level and temperature of tropopause;
- (v) direction, speed and flight level of maximum wind; and
- (vi) SIGWX phenomena;

- (b) METAR or SPECI (including trend forecasts as issued in accordance with a Regional Air Navigation Agreement) for the aerodromes of departure and intended landing, and for take-off, en- route and destination alternate aerodromes;
- (c) TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;
- (d) forecasts for take-off;
- (e) SIGMET information and appropriate special air-reports relevant to the whole route;
- (f) volcanic ash and tropical cyclone advisory information relevant to the whole route;
- (g) subject to a Regional Air Navigation Agreement, GAMET area forecast or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route;
- (h) aerodrome warnings for the local aerodrome;
- (i) meteorological satellite images; and
- (j) ground-based weather radar information.

(5) Forecasts listed under sub-regulation (4) (a) shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between the service provider and the operator concerned.

(6) When forecasts are identified as being originated by the WAFCs, no modifications shall be made to their meteorological content.

(7) Charts generated from the digital forecasts provided by the WAFCs shall be made available, as required by operators, for fixed areas of coverage in accordance with technical guidance provided by the Authority.

(8) When forecasts of upper wind and upper-air temperature are supplied in chart form, they shall be fixed time prognostic charts for flight levels in accordance with guidance provided by the Authority, and when forecasts of SIGWX phenomena are supplied in chart form, they shall be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified in technical standards developed by the Authority.

(9) The forecasts of upper wind and upper-air temperature and of SIGWX phenomena above flight level 100 requested for pre-flight planning and in- flight re-planning by the operator shall be supplied as soon as they become available, but not later than three (3) hours before departure and other meteorological information requested for pre-flight planning and in-flight re-planning by the operator shall be supplied as soon as is practicable.

(10) When necessary, the service provider providing service for operators and flight crew members shall initiate coordinating action with the meteorological authorities of other States with a view to obtaining from them the reports and/or forecasts required.

(11) Meteorological information shall be supplied to operators and flight crew members at the location to be determined by the service provider, after consultation with the operators and at the time to be agreed upon between the aerodrome meteorological office and the operator concerned.

(12) The service for preflight planning shall be confined to flights originating within Guyana's territory.

(13) At an aerodrome without an aerodrome meteorological office at the aerodrome, arrangements for the

supply of meteorological information shall be as agreed upon between the service provider and the operator concerned.

Briefing, consultation and display. **108.** (1) Briefing or consultation shall be provided, on request, to flight crew members or other flight operations personnel.

(2) Its purpose shall be to supply the latest available information on existing and expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, either to explain and amplify the information contained in the flight documentation or, if so agreed between the service provider and the operator, in lieu of flight documentation.

(3) Meteorological information used for briefing, consultation and display shall include any or all of the information.

(4) If the aerodrome meteorological office expresses an opinion on the development of the meteorological conditions at an aerodrome which differs appreciably from the aerodrome forecast included in the flight documentation, the attention of flight crew members shall be drawn to the divergence.

(5) The portion of the briefing dealing with the divergence shall be recorded at the time of briefing and this record shall be made available to the operator.

(6) The required briefing, consultation, display or flight documentation shall normally be provided by the aerodrome meteorological office associated with the aerodrome of departure.

(7) At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed upon between the service provider and the operator concerned.

(8) In exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation or flight documentation as necessary.

(9) The flight crew member or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested shall visit the aerodrome meteorological office at the time agreed upon between the aerodrome meteorological office and the operator concerned.

(10) Where local circumstances at an aerodrome make personal briefing or consultation impracticable, the aerodrome meteorological office shall provide those services by telephone or other suitable telecommunications facilities.

109. (1) Flight documentation to be made available shall comprise information on-

- (a) upper winds and upper-air temperature;
- (b) SIGWIX phenomena;
- (c) METAR or SPECI (including trend forecasts as issued in accordance with regional air navigation agreement) for the aerodromes of departure and intended landing, and for take-off, endestination route and alternate aerodromes;
- (d) TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;
- (e) SIGMET information and appropriate special air-reports relevant to the whole route:
- (f) volcanic ash and tropical cyclone advisory information relevant to the whole route, and if appropriate;
- (g) subject to a Regional Air Navigation Agreement, GAMET area forecast or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route.

(2) However, when agreed between the service provider and operator concerned, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally

Flight documentation.

needed, but in all cases the flight documentation shall at least comprise information in sub-regulation (1) (b), (c), (e), (f) and, if appropriate, (g).

(3) Whenever it becomes apparent that the meteorological information to be included in the flight documentation will differ materially from that made available for pre-flight planning and in flight re- planning, the operator shall be advised immediately and, if practicable, be supplied with the revised information as agreed between the operator and the aerodrome meteorological office concerned.

(4) In cases where a need for amendment arises after the flight documentation has been supplied, and before take-off of the aircraft, the aerodrome meteorological office shall, as agreed locally, issue the necessary amendment or updated information to the operator or to the local air traffic services unit, for transmission to the aircraft.

(5) The service provider shall retain information supplied to flight crew members, either as printed copies or in computer files, for a period of at least thirty days from the date of issue.

(6) This information shall be made available, on request, for inquiries or investigations and, for these purposes, shall be retained until the inquiry or investigation is completed.

110. (1) Where the service provider uses automated preflight information systems to supply and display meteorological information to operators and flight crew members for self-briefing, flight planning and flight documentation purposes, the information supplied and displayed shall comply with these Regulations.

(2) Automated pre-flight information systems providing for a harmonised, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned shall be established by an agreement between the meteorological service provider and the Authority.

(3) Where automated pre-flight information systems are used to provide for a harmonised, common point of access to meteorological information and aeronautical information

Automated pre- flight information systems for briefing, consultation, flight planning and flight documentation. services information by operators, flight crew members and other aeronautical personnel concerned, the service provider concerned shall remain responsible for the quality control and quality management of meteorological information provided by means of such systems.

Information for aircraft in flight. **111.** (1) Meteorological information for use by aircraft in flight shall be supplied by an aerodrome meteorological office or meteorological watch office to its associated air traffic services unit and through D-VOLMET or VOLMET broadcasts as determined by a Regional Air Navigation Agreement.

(2) Meteorological information for planning by the operator for aircraft in flight shall be supplied on request, as agreed between the service provider and the operator concerned.

(3) Meteorological information for use by aircraft in flight shall be supplied to air traffic services units in accordance with Part XII of these regulations.

(4) Meteorological information shall be supplied through D-VOLMET or VOLMET broadcasts in accordance with the requirements under "Information for Air Traffic Services, Search and Rescue Services and Aeronautical Information Services" of these regulations.

Information for Air Traffic Services, Search and Rescue Services and Aeronautical Information Services

Information for air traffic services units. **112.** (1) The service provider shall designate an aerodrome meteorological office or meteorological watch office to be associated with each air traffic services unit.

(2) The associated aerodrome meteorological office or meteorological watch office shall, after coordination with the air traffic services unit, supply, or arrange for the supply of, upto-date meteorological information to the unit as necessary for the conduct of its functions.

(3) An aerodrome meteorological office shall be associated with an aerodrome control tower or approach control unit for the provision of meteorological information.

(4) A meteorological watch office shall be associated with a flight information centre or an area control centre for the provision of meteorological information.

(5) Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or meteorological watch office to be shared between two or more aerodrome meteorological offices or meteorological watch offices, the division of responsibility shall be determined by the service provider in consultation with the appropriate ATS authority.

(6) Any meteorological information requested by an air traffic services unit in connection with an aircraft emergency shall be supplied as rapidly as possible.

Information Aerodrome meteorological **113.** (1) offices or for search and meteorological watch offices designated by the service provider rescue services in accordance with a Regional Air Navigation Agreement shall supply search and rescue services units with the meteorological information they require in a form established by mutual agreement.

> (2) For that purpose, the designated aerodrome meteorological office or meteorological watch office shall maintain liaison with the search and rescue services unit throughout a search and rescue operation.

Information 114. The service provider, in coordination with the Authority, shall arrange for the supply of up-to-date aeronautical meteorological information relevant to aeronautical information information services units, as necessary, for the conduct of their services units. functions.

Requirements for and Use of Communications

Requirements for communications.

units.

for

115. (1) Suitable telecommunications facilities shall be made available to permit aerodrome meteorological offices and, as necessary, aeronautical meteorological stations to supply the required meteorological information to air traffic services units on the aerodromes for which those offices and stations are responsible, and in particular to aerodrome control towers, approach control units and the aeronautical telecommunications stations serving these aerodromes.

(2) Suitable telecommunications facilities shall be made available to permit meteorological watch offices to supply the required meteorological information to air traffic services and search and rescue services units in respect of the flight information regions, control areas and search and rescue

regions for which those offices are responsible, and in particular to flight information centres, area control centres and rescue coordination centres and the associated aeronautical telecommunications stations.

(3) Suitable telecommunications facilities shall be made available to permit world area forecast centres to supply the required world area forecast system products to aerodrome meteorological offices, meteorological authorities and other users.

(4) Telecommunications facilities between aerodrome meteorological offices and, as necessary, aeronautical meteorological stations and aerodrome control towers or approach control units shall permit communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately fifteen seconds.

(5) Telecommunications facilities between aerodrome meteorological offices or meteorological watch offices and flight information centres, area control centres, rescue coordination centres and aeronautical telecommunications stations shall permit-

- (a) communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately fifteen seconds; and
- (b) printed communications, when a record is required by the recipients; the message transit time shall not exceed five minutes.

(6) The telecommunications facilities required shall be supplemented, as and where necessary, by other forms of visual or audio communications, for example, closed-circuit television or separate information processing systems.

(7) As agreed between the service provider and operators, provision shall be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.

(8) Suitable telecommunications facilities shall be made available to permit meteorological offices to exchange operational meteorological information with other meteorological offices.

(9) The telecommunications facilities used for the exchange of operational meteorological information shall be the aeronautical fixed service or, for the exchange of non-time critical operational meteorological information, the public Internet, subject to availability, satisfactory operation and bilateral or multilateral or regional air navigation agreements.

116. Meteorological bulletins containing operational meteorological information to be transmitted via the aeronautical fixed service or the public Internet shall be originated by the appropriate meteorological office or public Internet aeronautical meteorological station.

Meteorological bulletins.

Use of

Use of

aeronautical

fixed service

communica-

tions and the

aeronautical fixed service communications - world area forecast system products.

Use of aeronautical mobile service communications.

Use of aeronautical data link service contents of D-VOLMET Use of aeronautical broadcasting service contents of VOLMET broadcasts.

dissemination of the products shall be as determined by a Regional Air Navigation Agreement.

117. World area forecast system products in digital form

shall be transmitted using binary data communications

techniques and the method and channels used for the

118. The content and format of meteorological information transmitted to aircraft and by aircraft shall be consistent with the provisions of these Regulations.

119. D-VOLMET shall contain current METAR and SPECI, together with trend forecasts where available, TAF and SIGMET, special air- reports not covered by a SIGMET and where available, AIRMET.

120. (1) Continuous VOLMET broadcasts, normally on very high frequencies (VHF), shall contain current METAR and SPECI, together with trend forecasts where available.

(2) Scheduled VOLMET broadcasts, normally on high frequencies (HF), shall contain current METAR and SPECI, together with trend forecasts where available and,

where so determined by a Regional Air Navigation Agreement, TAF and SIGMET.

Exemptions

Requirements for application for exemption. **121.** (1) A person may apply to the Authority for an exemption from any provision of these Regulations.

> (2) Unless in case of emergency, a person requiring exemptions from any of these Regulations shall make an application to the Authority at least sixty days prior to the proposed effective date, giving the following information —

- (a) name and contact address including electronic mail and fax if any;
- (b) telephone number;
- (c) a citation of the specific requirement from which the applicant seeks exemption;
- (d) justification for the exemption;
- (e) a description of the type of operations to be conducted under the proposed exemption;
- (f) the proposed duration of the exemption;
- (g) an explanation of how the exemption would be in the public interest;
- (h) a detailed description of the alternative means by which the applicant will ensure a level of safety equivalent to that established by the regulation in question;
- A safety risk assessment carried out in respect of the exemption applied for;
- if the applicant handles international (j) operations and seeks to operate under the proposed exemption, an indication whether the exemption would provision the contravene any of Standards and Recommended Practices of the International Civil Aviation Organisation (ICAO); and
- (k) any other information that the Authority may require.

(3) Where the applicant seeks emergency processing of an application for exemption, the application shall contain supporting facts and reasons for not filing the application within the time specified in sub-regulation (2) and satisfactory reason for deeming the application an emergency.

(4) The Authority may in writing, refuse an application made under sub-regulation (3), where in the opinion of the Authority, the reasons given for emergency processing are not satisfactory.

(5) The application for exemption shall be accompanied by fee specified by the Authority.

Review and 122. (1) The Authority shall review the application for exemption for accuracy and compliance and if the application is satisfactory, the Authority shall publish a detailed summary of the application for comments, within a prescribed time, in either -

- (a) The Civil Aviation (Meteorological Services for Air Navigation) Regulations 2016: or
- (b) aeronautical information circular; or
- (c) a daily newspaper with national circulation.

(2) Where application requirements have not been fully complied with, the Authority shall request the applicant in writing, to comply prior to publication or making a decision under sub-regulation (3).

(3) If the request is for emergency relief, the Authority shall publish the decision as soon as possible after processing the application.

Evaluation of 123. (1) Where the application requirements have been the request. satisfied, the Authority shall conduct an evaluation of the request to include-

- (a) determination of whether an exemption would be in the public interest:
- (b) a determination, after a technical evaluation of whether the applicant's proposal would provide a level of safety equivalent to that established by the regulation, although where the Authority

publication.

decides that a technical evaluation of the request would impose a significant burden on the Authority's technical resources, the Authority may deny the exemption on that basis;

- (c) a determination of whether a grant of the exemption would contravene these Regulations; and
- (d) a recommendation based on the preceding elements, of whether the request should be granted or denied, and of any conditions or limitations that should be part of the exemption.

(2) The Authority shall notify the applicant in writing, the decision to grant or deny the request and publish a detailed summary of its evaluation and decision.

(3) The summary referred to in sub-regulation (2) shall specify the duration of the exemption and any conditions or limitations of the exemption.

(4) If the exemption affects a significant population of the aviation community of the State, the Authority shall publish the summary in aeronautical information circular.

General Provisions

Drug and alcohol testing and reporting. **124.** (1) Any person who performs any function prescribed by these Regulations directly or by contract under the provisions of these Regulations may be tested for drug or alcohol usage.

(2) A person who –

- (a) refuses to submit to a test to indicate the percentage by weight of alcohol in the blood; or
- (b) refuses to submit to a test to indicate the presence of narcotic drugs, marijuana, or depressant or stimulant drugs or substances in the body, when requested by a law enforcement officer or the

Authority, or refuses to furnish or to authorise the release of the test results requested by the Authority shall—

- (i) be denied any authorisation issued under these Regulations for a period of up to one year from the date of that refusal; or
- (ii) have their authorisation issued under these Regulations suspended or revoked.

(3) Any person who is convicted for the violation of any law relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or importation of narcotic drugs, marijuana, or depressant or stimulant drugs or substances, shall—

- (a) be denied any authorisation issued under these Regulations for a period of up to one year after the date of conviction; or
- (b) have their authorisation issued under these Regulations suspended or revoked.

Change of
name.**125.** (1) A holder of an authorisation issued under these
Regulations may apply to the Authority for—

- (a) replacement of the authorisation if lost or destroyed;
- (b) change of name on the authorisation; or
- (c) an endorsement on the authorisation.

(2) when applying under sub-regulation (1), the holder of an authorisation shall submit to the Authority—

- (*a*) the original authorisation or a copy thereof in case of loss; and
- (*b*) a court order, or other legal document verifying the name change.
- (3) The Authority shall return to the holder of an

| | authorisation, with th the originals specific necessary, retain copi | e appropriate changes applied for, if any, ed under sub-regulation (2) and, where es thereof. | |
|--|---|---|--|
| Change of address. | 126. (1) A holder of an authorisation issued under these Regulations shall notify the Authority of the change in the physical and mailing address within fourteen days of such change. | | |
| | (2) A perso change in the physic frame specified in s privileges of the autho | n who does not notify the Authority of the cal and mailing address within the time ub-regulation (1) shall not exercise the orisation. | |
| Replacement of documents. | 127. A person may apply to the Authority in the prescribed form for replacement of documents issued under these Regulations if such documents are lost or destroyed. | | |
| Use and retention of documents and records. | 128. (1) A person shall not— | | |
| | (a) | use any authorisation or exemption issued or required by or under these Regulations which has been forged, altered, cancelled, or suspended, or to which he is not entitled; or | |
| | (b) | forge or alter any authorisation or exemption issued or required by or under these Regulations; or | |
| | (c) | lend any authorisation or exemption issued or required by or under these Regulations to any other person; or | |
| | (d) | make any false representation for the purpose of procuring for himself or any other person the grant, issue, renewal or variation of any such authorisation or exemption. | |
| | (e) | mutilate, alter, render illegible or destroy any records, or any entry made therein, required by or under these Regulations to be maintained, or knowingly make, or | |

- procure or assist in the making of, any false entry in any such record, or willfully omit to make a material entry in

such record.

(2) All records required to be maintained by or under these Regulations shall be recorded in a permanent and indelible material.

(3) A person shall not issue any authorisation or exemption under these Regulations unless he is authorised to do so by the Authority.

(4) A person shall not issue any authorisation referred to in sub-regulation (3) unless he has satisfied himself that all statements in the authorisation are correct, and that the applicant is qualified to hold that authorisation.

Reports of **129.** (1) Any person who knows of a violation of the Act, violation. or any Regulations, rules, or orders issued thereunder, shall report it to the Authority.

> (2) The Authority may determine the nature and type of investigation or enforcement action that need to be taken.

Failure to 130. Any person who fails to comply with any direction comply with given to him by the Authority or by any authorised person direction. under any provision of these Regulations shall be deemed for the purposes of these Regulations to have contravened that provision.

fees.

Aeronautical **131.** (1) The Authority shall notify in writing the fees to be charged in connection with the issue, renewal or variation of any authorisation, test, inspection or investigation required by, or for the purpose of these Regulations any orders, notices or proclamations made thereunder.

> (2) Upon an application being made in connection with which any fee is chargeable in accordance with the provisions of sub-regulation (1), the applicant shall be required, before the application is accepted, to pay the fee so chargeable.

> (3) If, after that payment has been made, the application is withdrawn by the applicant or otherwise ceases to have effect or is refused, the Authority shall not refund the payment made.

Offences and Penalties

Contravention 132. A person who contravenes any provision of these of Regulations may have his authorisation or exemption cancelled Regulations. or suspended.

> 133. (1) A person who contravenes any provision of these Regulations, orders, notices or proclamations made there under shall, upon summary conviction, be liable to a fine or imprisonment or both, and in the case of a continuing contravention, each day of the contravention shall constitute a separate offence.

(2) Any person who contravenes any provision of these Regulations shall upon summary conviction be liable to a fine not exceeding one million dollars or to imprisonment for a term of not more than six months or to both.

(3) If it is proved that an act or omission of any person, which would otherwise have been a contravention by that person of a provision of these Regulations, orders, notices or proclamations made thereunder was due to any cause not avoidable by the exercise of reasonable care by that person, the act or omission shall be deemed not to be a contravention by that person of that provision.

PART IX

PROCEDURES FOR AIR NAVIGATION SERVICES -INSTRUMENT FLIGHT PROCEDURE DESIGN

Standards for 134. This Part prescribes the standards required to be met Procedures for for Procedures for Air Navigation Services - Aircraft Operations and the requirements for the design, continuous Navigation Services maintenance and periodic review of instrument flight procedures (IFP). Operations.

> 135. (1) The ANSP shall be designated by the Director General for providing such services.

(2) The designated ANSP shall follow an instrument flight procedure process that encompasses acquisition of data, design and promulgation of procedures.

Instrument Flight Procedure Design (IFPD) Service.

Air

Aircraft

Penalties.

(3) The designated ANSP shall ensure that the quality and safety of the procedure design product are assured through review, verification, coordination and validation of the procedure at appropriate points in the process.

(4) The designated ANSP shall ensure that the units of measurement, as specified in Part XI are used in the design of IFP.

136. The standards required to be met by IFPD organisation shall be -

Instrument Flight Procedure Design (IFDP) organisation.

- (a) The ANSP designated as the IFPD organisation shall maintain an appropriate instrument design office to enable the IFP designer to carry on design work in IFP in accordance with the requirements set out in this regulation.
- (b) The designated ANSP shall ensure that the designs of instrument flight procedure are in accordance with-
 - (i) applicable standards set out or referred to in PANS-OPS, Doc 8168, or
 - (ii) applicable standards as set out in this regulation.
- (c) The designated ANSP shall make provisions for person(s) trained in IFP design to check and verify independently the plans of each instrument flight procedure designer.
- (d) The ANSP designated as the IFPD organisation shall develop and maintain an operations manual which shall serve to demonstrate how the service provider will comply with the requirements set out in these regulations.

- (e) The contents of the operations manual shall include the following-
 - (i) the information required of the designated ANSP as mentioned in this regulation; and
 - (ii) a description of the IFPD office that shows the role, responsibilities job and functions of the IFP design office personnel who are responsible for ensuring the compliance of organisation with the the requirements in sub-paragraph (b)(i).
- (f) The designated ANSP shall:
 - (i) keep the operations manual in a readily accessible form;
 - (ii) ensure that the IFP designer has ready access to the operations manual; and
 - (iii) amend the operations manual whenever necessary to keep its content up to date.
- (g) The designated ANSP shall submit a copy of the most current operations manual to the Director General for approval.
- (h) The designated ANSP shall provide and maintain facilities for the design work on IFP as follows-
 - (i) Available equipment appropriate for the design, design verification, flight validation, and maintenance of the types of IFP;
 - (ii) access to relevant and current data including, but not limited

to, aeronautical data, land contour data, and obstacle data for the design, design verification, flight verification, and maintenance of the IFP; and

- (iii) ready access to copies of relevant documentation comprising technical standards, practices, and instructions, and any other documentation that may be necessary for the design, design verification, flight validation, and maintenance of the types of instrument flight procedure.
- (i) If an aeronautical database and aeronautical data is required for designing an instrument flight procedure, the IFP design organisation shall ensure the integrity of the database and the data and the data used shall be current, traceable, and meet the required level of verifiable accuracy for the design.
- (j) The designated ANSP shall establish and put into effect, a system for controlling documents and records relating to the IFP on which the designer carries on design work, including the policies and procedures for making, amending, preserving and disposing of those documents and records.
- (k) The designated ANSP shall, at the request of the Authority, make the documents and records, or copies of them or extracts from them, available for inspection.

137. The standards required to be met by IFP qualifications and training shall be –

Flight Procedure design

Instrument

qualifications and training.

- (a) The designated ANSP shall ensure that a person designing or amending a flight instrument procedure demonstrates required competency level for flight procedure design. IFP designers shall acquire and maintain this competency level through training and supervised on-the-job training (OJT).
- (*b*) The training for IFP designers shall include an initial training and recurrent training at periodic intervals.
- (c) The designated ANSP shall ensure that the IFP designer is able to demonstrate a basic level of competency through initial training that includes at least the following elements:
 - (i) knowledge of information contained in PANS-OPS, Doc 8168, Volumes I and II and other related ICAO provisions relevant to the State;
 - (ii) skills in the design of procedures; and
 - (iii) demonstration of competency as outlined in the competency framework for flight procedures designed as outlined in ICAO Doc 9906 Quality Assurance Manual for Flight Procedure Design, Volume 2 Flight Procedure Designer Training, Table 2-1.
- (d) The designated ANSP shall ensure that the IFP designer is able to demonstrate a basic level of competency through recurrent training that includes at least the following elements:
 - (i) knowledge about updates in ICAO provisions and other provisions pertaining to

procedure design; and

- (ii) maintenance and enhancement of knowledge and skills in the design of procedures.
- (*e*) The designated ANSP shall maintain training records for their IFP designers.

138. The standards required to be met by procedure design information acquisition shall be –

- (a) The designated ANSP shall ensure that the survey and subsequent IFP design activities are controlled and monitored by a person(s) trained in procedure design.
- (b) In the obstacle survey for procedure design, the IFP designer shall consider that-
 - (i) all obstacles be accounted for. Items, such as trees and heights of tall buildings shall be accounted for either by physical examination of the site or by addition of a suitable margin above terrain contours; and
 - (ii) the accuracy of the vertical and horizontal data obtained may be adjusted by adding an amount equal to the specified survey error to the height of all measured obstructions and by making a corresponding adjustment for specified horizontal error.
- (c) The procedure design information shall be coordinated with all relevant stakeholders. As input for the procedure design process the following aspects need to be assessed:

Procedure Design Information Acquisition.

- (i) airport, navigation aid, obstacle, terrain coordinate and elevation data, based on verified surveys and complying with Parts V and VI of these regulations and Civil Aviation (Aerodromes) Regulations 2016.
- (ii) airspace requirements;
- (iii) user requirements the needs of Air Traffic Service provider and operators who will use this procedure;
- (iv) airport infrastructure such as runway classification, lighting, communications, runway markings, and availability of local altimeter setting;
- (v) environmental considerations; and
- (vi) any other potential issue associated with the procedure.

139. The standards required to be met by IFPD shall be

- (a) procedures shall be designed according to the PANS-OPS, Doc 8168 criteria. Coordination with all concerned parties shall continue throughout the procedure design and validation process to ensure that the procedure meets the needs of the user and the community.
- (b) each new or revised procedure shall be verified by a qualified procedure designer other than the one who designed the procedure, to ensure compliance with applicable criteria.
- (c) published procedures shall be

Instrument Flight Procedure Design.

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subject to periodic review to ensure that they continue to comply with changing criteria, and continue to meet user requirements. The maximum interval for this review is five (5) years.

- (d) the documentation provided by the IFP designer is divided into three (3) categories and includes:
 - (i) documentation required for publication in the AIP in accordance with Parts VI and VII of these regulations.
 - (ii) documentation required to maintain transparency concerning the details and assumptions used by the IFP designer, which should include supporting information/data used in the design, such as:
 - A. controlling obstacle for each segment of the procedure;
 - B. effect of environmental considerations on the design of the procedure;
 - C. infrastructure assessment;
 - D. airspace constraints;
 - E. for modifications or amendments to existing procedures, the reasons for any changes;
 - F. for any deviation from existing standards, the reasons for such a deviation and details of the mitigations applied

to assure continued safe operations; and

- G. the results of the final verification for accuracy and completeness (quality assurance checks) prior to validation and then prior to publication;
- (iii) additional documentation required to facilitate ground and flight validation of the procedure.
- (e) All calculations and results of calculations shall be presented in a manner that enables the reader to follow and trace the logic and resultant output. A record of all calculations shall be kept in order to prove compliance to or variation from the standard criteria.
- (f) Formulae used during calculation shall be the standard formulae as stated in the PANS-OPS. Units of measurement and conversion factors between such units shall be in accordance with Parts XI of these Regulations.
- (g) Rounding of results shall follow the standard guidelines in the PANS-OPS. Rounding shall only be made at the publication stage to facilitate usable figures on maps and charts. Where rounding is required at earlier stages rounding shall be made to the pessimistic consideration.
- (h) All documentation shall undergo a final verification for accuracy and completeness prior to validation and publication.

- (i) All documentation shall be retained to assist in recreating the procedure in the future in the case of incidents and for periodic review and maintenance. The periodic retention shall not be less than the operational lifetime of the procedure.
- (j) Validation shall consist of ground validation and flight validation.
- (k) Ground validation shall always be undertaken.
- When ground validation can verify the accuracy and completeness of all obstacle and navigation data considered in the procedure design, and any other factors normally considered in the flight validation, then the flight validation requirement may be dispensed with.
- (m) Ground validation shall review of the entire instrument flight procedure package by a person(s) trained in procedure design and with appropriate knowledge of flight validation issues.
- (n) The ground validation shall be conducted to determine if flight validation is needed for modifications and amendments to previously published procedures.
- (o) Flight validation of IFP when required shall be carried out as part of the initial record and shall be included as part of the periodic quality assurance programme. It shall be accomplished by a qualified and experienced Flight Validation Pilot (FVP).

- (p) The flight validation of IFP shall:
 - (i) provide assurance that adequate obstacle clearance has been provided;
 - (i) verify that the navigation data to be published, as well as that used in the design of the procedure, is correct;
 - (ii) verify that all required infrastructure, such as runway markings, lighting, and communications and navigation sources, are in place and operative;
 - (iii) conduct an assessment of fly ability to determine that the procedure can be safely flown; and
 - (iv) evaluate the charting, required infrastructure, visibility and other operational factors.
- (q) The IFP design organisation shall ensure that flight validation is conducted in accordance with the requirements of ICAO Doc 9906, Volume 5 – Validation of IFP.
- (r) The qualifications for FVP shall include:
 - (i) at least a commercial pilot licence with instrument rating. Alternatively, an equivalent the authorisation from appropriate authority designated by the Contracting Party meeting the Annex 1 skill knowledge and requirements for issuing the commercial pilot license and instrument rating is acceptable;

- (ii) the licence held by the FVP shall be for the aircraft category (e.g. aeroplane or helicopter) appropriate for the procedure to be validated; and
- (iii) FVPs shall meet all the experience requirements for the airline transport pilot licence in the relevant category of aircraft (e.g. aeroplane or helicopter) as defined in Annex 1. The FVP does not have to be the pilot-incommand of the validation flight nor is he required to have the type rating on the aircraft used for the validation flight.
- (s) In order to adequately validate instrument procedures, FVPs training shall include the following:
 - Standards, procedures and guidance pertinent to AIS, including Part VI of these Regulations;
 - (ii) Standards, procedures and guidance pertinent to flight inspection, including Annex 10 and ICAO Doc 8071 – Manual on Testing of Radio Navigation Aids;
 - (iii) Standards, procedures and guidance pertinent to aerodromes, including Civil Aviation (Aerodromes) Regulations 2016, ICAO Doc 9157 – Airport Services Manual and ICAO Doc 9157 – Aerodrome Design Manual;
 - (iv) Standards, procedures and guidance pertinent to charting

and aviation publications including Part VII of these Regulations and ICAO Doc 8697 — Aeronautical Chart Manual;

- (v) performance-based navigation (PBN) and conventional instrument procedure construction such as standard instrument departures/standard instrument arrivals (SIDs/STARs) and holding/reversal procedures, including the PANS-OPS;
- (vi) the PBN concept including the ICAO Doc 9613 — Performancebased Navigation (PBN) Manual;
- (vii) the basic concept of and differences between flight validation and flight inspection;
- (viii) ARINC 424 coding;
- (ix) Human Factors;
- (x) different types of aircraft operations and aircraft performance (i.e. limitations and equipment);
- (xi) obstacle assessment methodology;
- (xii) safety assessment process;
- (Xiii) geodesy, including ICAO Doc 9906, Volume 2, paragraph 3.3.3.8; and
- (xiv) comprehensive understanding of ICAO Doc 9906, Volume 5.

(t) The IFP designer shall be the originator of all data applicable to conduct a flight validation provided to the flight inspection operations activity.

Design **140.** The standards required to be met by design publication.

- (*a*) The designated ANSP shall ensure that IFP designs/charts, are provided to the Aeronautical Information Service (AIS) provider for publication in the AIP.
- (*b*) The IFP shall be accompanied by a narrative, which describes the procedure in textual format.
- (c) The intended effective date for operational use of the IFP shall be included in the document narrative.
- (*d*) The designs/charts published in the AIP shall be produced in accordance with the provisions contained in the documents listed below:
 - (i) Civil Aviation (Air Navigation Services) Regulations Part VII— Aeronautical Charts.
 - (ii) ICAO Doc 8168 Procedures for Air Navigation Services — Aircraft Operations, Volumes I and II (PANS-OPS);
 - (iii) ICAO Doc 8697; and
 - (iv) Subpart 7.5 Part VI of these Regulations.
- (e) The aeronautical charts included in the AIP shall be kept up-to-date by means of replacement sheets where necessary. Significant amendments or revisions in the IFP shall be clearly indicated in the

revised charts.

Procedure **141.** The standards required to be met by procedure design automation. design automation shall be –

- (a) the designated ANSP shall ensure that the software packages used in the design of procedures have been validated.
- (b) validation of the software shall be in accordance with the requirements of ICAO Doc 9906, Volume 3 — Flight Procedure Design Software Validation.

PART X SEARCH AND RESCUE

| Application. | 142. This Part deals with search and rescue services. | | |
|-----------------|--|--|--|
| Interpretation. | 143. (1) In this Part— | | |
| | (a) | "alerting post" means any facility intended to serve as an intermediary between a person reporting an emergency and a rescue coordination centre or rescue sub- centre; | |
| | (b) | "ditching" means the forced landing of an aircraft on water; | |
| | (c) | "Joint Rescue Coordination Centre (JRCC)" means a rescue coordination centre responsible for both aeronautical and maritime search and rescue operations; | |
| | (d) | "rescue" means an operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety; | |

- (e) "search" means an operation normally coordinated by a rescue coordination centre or rescue subcentre using available personnel and facilities to locate persons in distress;
- (f) "search and rescue aircraft" means an aircraft provided with specialised equipment suitable for the efficient conduct of search and rescue missions;
- (g) "search and rescue facility" means any mobile resource, including designated search and rescue units, used to conduct search and rescue operations;
- (h) "search and rescue service" means performance the of distress monitoring, communication, coordination and search and rescue functions, initial medical assistance or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other craft and installations;
- (i) "search and rescue region (SRR)" means an area of defined dimensions, associated with a rescue coordination centre, within which search and rescue services are provided;
- (j) "search and rescue unit" means a mobile resource composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations;
- (k) "State of Registry" means the State on whose register the aircraft is entered;

- (l) "uncertainty phase" means a situation wherein uncertainty exists as to the safety of an aircraft and its occupants; and
- (m) "vessel" means any water-navigable craft of any type, whether selfpropelled or not.

Application of this Part. **144.** This Part shall apply to all aircraft requiring search and rescue services and to persons or organisations responsible for the maintenance and operation of search and rescue services in Guyana and in areas over the high seas to which Guyana has been given responsibility under the regional air navigation plan.

Search and Rescue Organisation

of 145. (1) The Director, Air Navigation Services shall be designated as the coordinator for aeronautical search and rescue operations in Guyana.

(2) The Authority shall, individually or in cooperation with other States, arrange for the establishment and prompt provision of search and rescue services within the territory to ensure that assistance is rendered to persons in distress. Such services shall be provided on a 24-hour basis.

(3)Those portions of the high seas or areas of undetermined sovereignty for which search and rescue services will be established shall be determined on the basis of regional air navigation agreements. The Authority having accepted the responsibility to provide search and rescue services in such areas shall thereafter, individually or in cooperation with other States, arrange for the services to be established and provided in accordance with the provisions of Annex 12 of the Chicago Convention.

(4) Basic elements of search and rescue services shall include a legal framework, a responsible authority, organised available resources, communication facilities and a workforce skilled in coordination and operational functions.

(5) Search and rescue services shall establish processes to improve service provision, including the aspects of planning, domestic and international cooperative arrangements

Provision of search and rescue services. and training.

(6) In providing assistance to aircraft in distress and to survivors of aircraft accidents, The Authority shall do so regardless of the nationality or status of such persons or the circumstances in which such persons are found.

(7) The Authority having accepted responsibility to provide search and rescue services shall use search and rescue units and other available facilities to assist any aircraft or its occupants that are or appear to be in a state of emergency.

(8) Where separate aeronautical and maritime rescue coordination centres serve the same area, the Authority shall ensure the closest practicable coordination between the centres.

(9) The Authority shall facilitate consistency and cooperation between their aeronautical and maritime search and rescue services.

(10) The Authority shall establish joint rescue coordination centres to coordinate aeronautical and maritime search and rescue operations, where practical.

146. (1) The Authority shall delineate the search and rescue regions. rescue regions within which they will provide search and rescue services. Such regions shall not overlap and neighbouring regions shall be contiguous.

> (2) Search and rescue regions shall, in so far as be coincident with corresponding practicable, flight information regions and, with respect to those areas over the high seas, maritime search and rescue regions.

Rescue coordination centres and rescue subcentre

Search and

147. (1) The Authority shall establish a rescue coordination centre in each search and rescue region.

(2) Where all or part of the airspace is included within a search and rescue region associated with a rescue coordination centre in another Contracting State, the Authority shall establish a rescue sub-centre subordinate to the rescue coordination centre wherever this would improve the efficiency of search and rescue services within Guyana's territory.

(3) Each rescue coordination centre and, as

appropriate, rescue sub-centre, shall be staffed 24 hours a day by trained personnel proficient in the use of the language used for radiotelephony communications.

(4) Rescue coordination centre personnel involved in the conduct of radiotelephony communications shall be proficient in the use of the English language.

(5) In areas where public telecommunications facilities would not permit persons observing an aircraft in emergency to notify the rescue coordination centre concerned directly and promptly, the Director General shall designate suitable units of public or private services as alerting posts.

Search and rescue communications. **148.** (1) Each rescue coordination centre shall have means of rapid and reliable two-way communication with:

- (*a*) associated air traffic services units;
- (b) associated rescue sub-centres;
- (c) appropriate direction-finding and position-fixing stations;
- (*d*) where appropriate, coastal radio stations capable of alerting and communicating with surface vessels in the region;
- (*e*) the headquarters of search and rescue units in the region;
- (f) all maritime rescue coordination centres in the region and aeronautical, maritime or joint rescue coordination centres in adjacent regions;
- (g) a designated meteorological office or meteorological watch office;
- (*h*) search and rescue units;
- (i) alerting posts; and
- (*j*) the Cospas-Sarsat Mission Control Centre servicing the search and rescue region.
(2) Each rescue sub-centre shall have means of rapid and reliable two-way communication with:

- (*a*) adjacent rescue sub-centres;
- (*b*) a meteorological office or meteorological watch office;
- (c) search and rescue units; and
- (*d*) alerting posts.

Search and **149.** (1) The Authority shall designate as search and rescue units. It is elements of public or private services suitably located and equipped for search and rescue operations.

(2) The Authority shall designate as parts of the search and rescue plan of operation, elements of public or private services that do not qualify as search and rescue units but are nevertheless able to participate in search and rescue operations.

150. (1) Search and rescue units shall be provided with equipment for locating promptly, and for providing adequate assistance at, the scene of an accident.

(2) Each search and rescue unit shall have means of rapid and reliable two-way communication with other search and rescue facilities engaged in the same operation.

(3) Each search and rescue aircraft shall be equipped to be able to communicate on the aeronautical distress and onscene frequencies and on such other frequencies as may be prescribed.

(4) Each search and rescue aircraft shall be equipped with a device for homing in on distress frequencies.

(5) Each search and rescue aircraft, when used for search and rescue over maritime areas, shall be equipped to be able to communicate with vessels.

(6) Each search and rescue aircraft, when used for search and rescue over maritime areas shall carry a copy of the International Code of Signals to enable it to overcome language difficulties that may be experienced in communicating with

Search and rescue equipment. ships.

(7) Unless it is known that there is no need to provide supplies to survivors by air, at least one (1) of the aircraft participating in a search and rescue operation shall carry droppable survival equipment.

(8) The Authority shall locate, at appropriate aerodromes, survival equipment suitably packed for dropping by aircraft.

Cooperation

Cooperation
between
States.151. (1) The Authority shall coordinate its search and
rescue organisations with those of neighbouring States.

(2) The Authority shall whenever necessary, coordinate its search and rescue operations with those of neighbouring States especially when these operations are proximate to adjacent search and rescue regions.

(3) The Authority shall in so far as practicable, develop common search and rescue plans and procedures to facilitate coordination of search and rescue operations with those of neighbouring States.

(4) The authorities of another State who wish their search and rescue units to enter the territory of Guyana for search and rescue purposes shall transmit a request, giving full details of the projected mission and the need for it, to the rescue coordination centre of Guyana or to such other authority as has been designated by that State.

(*a*) The Authority shall:

- (i) immediately acknowledge the receipt of such a request, and
- (ii) as soon as possible, indicate the conditions, if any, under which the projected mission may be undertaken.

(6) The Authority shall enter into agreements with Authorities of neighbouring States to strengthen search and rescue cooperation and coordination, setting forth the conditions for entry of each other's search and rescue units into their respective territories. These agreements should also provide for expediting entry of such units with the least possible formalities.

(7) The Authority shall authorise its rescue coordination centres to:

- (a) request from other rescue coordination centres such assistance, including aircraft, vessels, persons or equipment, as may be needed;
- (b) grant any necessary permission for the entry of such aircraft, vessels, persons or equipment into its territory; and
- (c) make the necessary arrangements with the appropriate customs, immigration or other authorities with a view to expediting such entry.

(8) The Authority shall authorise its rescue coordination centres to provide, when requested, assistance to other rescue coordination centres, including assistance in the form of aircraft, vessels, persons or equipment.

(9) The Authority shall make arrangements for joint training exercises involving its search and rescue units, those of other States and operators, in order to promote search and rescue efficiency.

(10) The Authority shall make arrangements for periodic liaison visits by personnel of its rescue coordination centres and sub-centres to the centres of neighbouring States.

Cooperation with other services.

152. (1) The Authority shall arrange for all aircraft, vessels and local services and facilities that do not form part of the search and rescue organisation to cooperate fully with the latter in search and rescue and to extend any possible assistance to the survivors of aircraft accidents.

(2) The Authority shall ensure the closest practicable coordination between the relevant aeronautical and maritime authorities to provide for the most effective and efficient search and rescue services.

(3) The Authority shall ensure that its search and rescue services cooperate with those responsible for investigating accidents and with those responsible for the care of those who suffered from the accident.

(4) To facilitate accident investigation, rescue units shall, when practicable, be accompanied by persons qualified in the conduct of aircraft accident investigations.

(5) The Authority shall designate a search and rescue point of contact for the receipt of COSPAS-SARSAT distress data.

Dissemination 153. (1) The Authority shall publish and disseminate all information necessary for the entry of search and rescue units information. of other States into its territory or, alternatively, include this information in search and rescue service arrangements.

> (2) When such information could benefit the provision of search and rescue services, the Authority shall make available, through the rescue coordination centres or other agencies, information regarding their search and rescue plans of operation.

> (3) The Authority shall to the extent desirable and practicable, disseminate information to the general public and emergency response authorities regarding actions to be taken when there is reason to believe that an aircraft's emergency situation may become cause for public concern or require a general emergency response.

Preparatory Measures

154. (1) Each rescue coordination centre shall have readily available at all times up-to-date information concerning the following in respect of its search and rescue region-

- (a) search and rescue units, rescue subcentres and alerting posts;
- (b) air traffic services units;
- (c) means of communication that may be used in search and rescue operations;
- (d) addresses and telephone numbers of all operators, or their designated representatives, engaged in operations

Preparatory information.

of

in the region; and

(e) any other public and private resources including medical and transportation facilities that are likely to be useful in search and rescue.

(2) Each rescue coordination centre shall have readily available all other information of interest to search and rescue, including information regarding:

- (a) the locations, call signs, hours of watch, and frequencies of all radio stations likely to be employed in support of search and rescue operations;
- (b) the locations and hours of watch of services keeping radio watch, and the frequencies guarded;
- (c) locations where supplies of droppable emergency and survival equipment are stored; and
- (*d*) objects which it is known might be mistaken for un-located or unreported wreckage, particularly if viewed from the air.
- (e) Each rescue coordination centre whose search and rescue region includes maritime areas shall have ready access to information regarding the position, course and speed of ships within such areas that may be able to provide assistance to aircraft in distress and information on how to contact them.

(3) The Authority shall, individually or in cooperation with other States, either establish ship reporting systems in cooperation with maritime authorities or arrange communication links with Amver or regional ship reporting systems to facilitate search and rescue operations at sea.

Plans of operation. **155.** (1) Each rescue coordination centre shall prepare detailed plans of operation for the conduct of search and rescue operations within its search and rescue region.

(2) Search and rescue plans of operations shall be developed jointly with representatives of the operators and other public or private services that may assist in providing search and rescue services or benefit from them, taking into account that the number of survivors could be large.

(3) The plans of operation shall specify arrangements for the servicing and refuelling, to the extent possible, of aircraft, vessels and vehicles employed in search and rescue operations, including those made available by other States.

(4) The search and rescue plans of operation shall contain details regarding actions to be taken by those persons engaged in search and rescue, including:

- (a) the manner in which search and rescue operations are to be conducted in the search and rescue region;
- (*b*) the use of available communication systems and facilities;
- (*c*) the actions to be taken jointly with other rescue coordination centres;
- (*d*) the methods of alerting en-route aircraft and ships at sea;
- (e) the duties and prerogatives of persons assigned to search and rescue;
- (f) the possible redeployment of equipment that may be necessitated by meteorological or other conditions;
- (g) the methods for obtaining essential information relevant to search and rescue operations, such as weather reports and forecasts, appropriate NOTAM, etc.;
- (*h*) the methods for obtaining, from other rescue coordination centres, such assistance, including aircraft, vessels, persons or equipment, as may be needed;
- (i) the methods for assisting distressed

| aircraft | being | compelled | to | ditch | to |
|--------------------------------|-------|-----------|----|-------|----|
| rendezvous with surface craft; | | | | | |

| (j) | the | me | etho | ods | fo | r assist | ing | search | a | nd |
|-----|------|------|------|------|-----|----------|------|--------|---|----|
| | resc | ue | or | oth | ner | aircraft | t to | procee | d | to |
| | airc | raft | in | dist | res | s; and | | | | |

(k) cooperative actions to be taken in conjunction with air traffic services units and other authorities concerned to assist aircraft known or believed to be subject to unlawful interference.

(5) Search and rescue plans of operation shall be integrated with airport emergency plans to provide for rescue services in the vicinity of aerodromes including, for coastal aerodromes, areas of water.

 Search and rescue units.
 156.(1) Each search and rescue unit shall:

 (a) be cognisant of all parts of the plans of operation prescribed in regulation 155 that are necessary for the effective conduct of its duties; and

 (b) keep the rescue coordination centre informed of its preparedness.

(2) The Authority shall:

- (a) maintain in readiness the required number of search and rescue facilities; and
- (*b*) maintain adequate supplies of rations, medical stores, signaling devices and other survival and rescue equipment.
- Training and exercises. **157.** To achieve and maintain maximum efficiency in search and rescue, the Authority shall provide for regular training of their search and rescue personnel and arrange appropriate search and rescue exercises.
- Wreckage. **158.** The Director General shall ensure that wreckage resulting from aircraft accidents within the territory of Guyana or, in the case of accidents on the high seas or in areas of

undetermined sovereignty, within the search and rescue regions for which it is responsible, is removed, obliterated or charted following completion of the accident investigation, if its presence might constitute a hazard or confuse subsequent search and rescue operations.

Operating Procedures

Information concerning emergencies. **159.** (1) Any authority or any element of the search and rescue organisation having reason to believe that an aircraft is in an **emergency** shall give immediately all available information to the rescue coordination centre concerned.

(2) Rescue coordination centres shall, immediately upon receipt of information concerning aircraft in emergency, evaluate such information and assess the extent of the operation required.

(3) When information concerning aircraft in emergency is received from other sources than air traffic services units, the rescue coordination centre shall determine to which emergency phase the situation corresponds and shall apply the procedures applicable to that phase.

Procedures for rescue coordination centres during emergency phases.

160.(1) Uncertainty phase -

Upon the occurrence of an uncertainty phase, the rescue coordination centre shall cooperate to the utmost with air traffic services units and other appropriate agencies and services in order that incoming reports may be speedily evaluated.

(2) Alert phase -

Upon the occurrence of an alert phase the rescue coordination centre shall immediately alert search and rescue units and initiate any necessary action.

(3) Distress phase -

Upon the occurrence of a distress phase, the rescue coordination centre shall:

- (a) immediately initiate action by search and rescue units in accordance with the appropriate plan of operation;
- (b) ascertain the position of the aircraft, estimate the degree of uncertainty of this position, and, on the basis of this information and the circumstances,

determine the extent of the area to be searched;

- (c) notify the operator, where possible, and keep the operator informed of developments;
- (d) notify other rescue coordination centres, the help of which seems likely to be required, or which may be concerned in the operation;
- (e) notify the associated air traffic services unit, when the information on the emergency has been received from another source;
- (f) request at an early stage such aircraft, vessels, coastal stations and other services not specifically included in the appropriate plan of operation and able to assist to:
 - (i) maintain a listening watch for transmissions from the aircraft in distress, survival radio equipment or an ELT;
 - (ii) assist the aircraft in distress as far as practicable; and
 - (iii) inform the rescue coordination centre of any developments;
- (g) from the information available, draw up a detailed plan of action for the conduct of the search and/or rescue operation required and communicate such plan for the guidance of the authorities immediately directing the conduct of such an operation;
- (h) amend as necessary, in the light of evolving circumstances, the detailed plan of action;
- (i) notify the appropriate accident

investigation authorities; and

(*i*) notify the State of Registry of the aircraft.

The order in which these actions are described shall be followed unless circumstances dictate otherwise.

(4) Initiation of search and rescue action in respect of an aircraft whose position is unknown:

- (a) In the event that an emergency phase is declared in respect of an aircraft whose position is unknown and may be in one of two or more search and rescue regions, the following shall apply:
 - (i) When a rescue coordination centre is notified of the existence of an emergency phase and is unaware of other centres taking appropriate action, it shall assume responsibility for initiating suitable action in accordance with Regulation 160 and confer with neighbouring rescue coordination centres with the objective of designating one (1) rescue coordination centre to assume responsibility forthwith.
 - (ii) Unless otherwise decided by common agreement of the rescue coordination centres the concerned, rescue coordination centre to coordinate search and rescue action shall be the centre responsible for:
 - A. the region in which the aircraft last reported its position; or
 - B. the region to which the aircraft was proceeding when its last reported position was on the line

separating two (2) search and rescue regions; or

- C. the region to which the aircraft was destined when it was not equipped with suitable radio two-way communication or not under obligation to maintain radio communication; or
- D. the region in which the distress site is located as identified by the Cospas-Sarsat system.
- (iii) After declaration of the distress phase, the rescue coordination centre with overall coordination responsibility shall inform all rescue coordination centres that may become involved in the operation of all the circumstances of the emergency and subsequent developments. Likewise, all rescue coordination centres becoming aware of any information pertaining to the emergency shall inform the rescue coordination centre that has overall responsibility.

(5) In passing of information to aircraft in respect of which an emergency phase has been declared, and whenever applicable, the rescue coordination centre responsible for search and rescue action shall forward to the air traffic services unit serving the flight information region in which the aircraft is operating, information of the search and rescue action initiated, in order that such information can be passed to the aircraft. **161.** Where the conduct of operations over the entire search and rescue region is the responsibility of more than one Contracting State, each involved State shall take action in accordance with the relevant plan of operations when so requested by the rescue coordination centre of the region.

162.The Authority immediately directing the conduct of operations or any part thereof shall-

- (a) give instructions to the units under their direction and inform the rescue coordination centre of such instructions; and
- (b) keep the rescue coordination centre informed of developments.

Procedures for rescue coordination centres termination and suspension of operations. **163.** (1) Search and rescue operations shall continue, when practicable, until all survivors are delivered to a place of safety or until all reasonable hope of rescuing survivors has passed.

(2) The responsible rescue coordination centre shall normally be responsible for determining when to discontinue search and rescue operations.

(3) When a search and rescue operation has been successful or when a rescue coordination centre considers, or is informed, that an emergency no longer exists, the emergency phase shall be cancelled, the search and rescue operation shall be terminated and any authority, facility or service that has been activated or notified shall be promptly informed.

(4) If a search and rescue operation becomes impracticable and the rescue coordination centre concludes that there might still be survivors, the centre shall temporarily suspend on-scene activities pending further developments and shall promptly inform any authority, facility or service which has been activated or notified. Relevant information subsequently received shall be evaluated and search and rescue operations resumed when justified and practicable.

Procedures at the scene of an accident.

164. (1) When multiple facilities are engaged in search and rescue operations on-scene, the rescue coordination centre or rescue sub-centre shall designate one (1) or more units on-scene to coordinate all actions to help ensure the safety and effectiveness of air and surface operations, taking into account

where responsibility for operations extends to two (2) or more Contracting States.

Procedures

Procedures for authorities in the field. facility capabilities and operational requirements.

(2) When a pilot-in-command observes that either another aircraft or a surface craft is in distress, the pilot shall, if possible and unless considered unreasonable or unnecessary-

- (a) keep the craft in distress in sight until compelled to leave the scene or advised by the rescue coordination centre that it is no longer necessary;
- (b) determine the position of the craft in distress;
- (c) as appropriate, report to the rescue coordination centre or air traffic services unit as much of the following information as possible:
 - (i) type of craft in distress, its identification and condition;
 - (ii) its position, expressed in geographical or grid coordinates or in distance and true bearing from a distinctive landmark or from a radio navigation aid;
 - (iii) time of observation expressed in hours and minutes Coordinated Universal Time (UTC);
 - (iv) number of persons observed;
 - (v) whether persons have been seen to abandon the craft in distress;
 - (vi) on-scene weather conditions;
 - (vii) apparent physical condition of survivors;
 - (viii) apparent best ground access route to the distress site; and

- (d) act as instructed by the rescue coordination centre or the air traffic services unit-
 - (i) If the first aircraft to reach the scene of an accident is not a search and rescue aircraft, it shall take charge of on-scene activities of all other aircraft subsequently arriving until the first search and rescue aircraft reaches the scene of the accident.
 - (ii) If, in the meantime, such aircraft is unable to establish with communication the appropriate rescue coordination centre or air traffic services unit, it shall, by mutual agreement, hand over to an aircraft capable of establishing and maintaining such communications until the arrival of the first search and rescue aircraft.

(3) When it is necessary for an aircraft to convey information to survivors or surface rescue units, and two-way communication is not available, it shall, if practicable, drop communication equipment that would enable direct contact to be established, or convey the information by dropping a hard copy message.

(4) When a ground signal has been displayed, the aircraft shall indicate whether the signal has been understood or not by the means described in (3) above or, if this is not practicable, by making the appropriate visual signal.

(5) When it is necessary for an aircraft to direct a surface craft to the place where an aircraft or surface craft is in distress, the aircraft shall do so by transmitting precise instructions by any means at its disposal. If no radio communication can be established, the aircraft shall make the appropriate visual signal.

| Procedures for a pilot-in- command | 165. Whenever a distress transmission is intercepted by a pilot-in command of an aircraft, the pilot shall, if feasible: | | | | | |
|---|---|--|--|--|--|--|
| intercepting a distress transmission. | (a) acknowledge the distress transmission; | | | | | |
| | (<i>b</i>) record the position of the craft in distress if given; | | | | | |
| | (c) take a bearing on the transmission; | | | | | |
| | (<i>d</i>) inform the appropriate rescue coordination centre or air traffic services unit of the distress transmission, giving all available information; and | | | | | |
| | (e) at the pilot's discretion, while awaiting instructions, proceed to the position given in the transmission. | | | | | |
| Search and rescue signals. | 166. (1) The air-to-surface and surface-to-air visual signals in the Schedule 23 shall, when used, have the meaning indicated therein. They shall be used only for the purpose indicated and no other signals likely to be confused with them shall be used. | | | | | |
| Schedule 23. | | | | | | |
| Schedule 23 | (2) Upon observing any of the signals in Schedule 23, aircraft shall take such action as may be required by the interpretation of the signal given in that Schedule. | | | | | |
| Maintenance of records. | 167. (1) Each rescue coordination centre shall keep a record of the operational efficiency of the search and rescue organisation in its region. | | | | | |
| | | | | | | |

(2) Each rescue coordination centre shall prepare appraisals of actual search and rescue operations in its region. These appraisals shall comprise any pertinent remarks on the procedures used and on the emergency and survival equipment, and any suggestions for improvement of those procedures and equipment. Those appraisals which are likely to be of interest to other States should be submitted to ICAO for information and dissemination as appropriate.

PART XI UNITS OF MEASUREMENT

International 168. (1) The SI Units developed and maintained by the System of General Conference of Weights and Measures (CGPM) shall, subject to the provisions of sub-regulation (2), be used as the standard system of units of measurement for all aspects of international civil aviation air and ground operations in Guyana.

Units (SI

Units).

(2) The prefixes and symbols listed in Table 3-1 of Annex 5 shall be used to form names and symbols of the decimal multiples and sub-multiples of SI Units.

Non-SI Units. **169.** (1) The non-SI Units listed in Annex 5, Table 3-2 shall be used either in lieu of, or in addition to, the SI Units as the units of measurement but only as specified in Annex 5, Table 3-4.

> (2) The non-SI Units listed in Annex 5, Table 3-3 shall be permitted for temporary use as alternative units of measurement but only for those specific quantities listed in Annex 5, Table 3-4.

> (3) The application of units of measurements for certain quantities used in international civil aviation air and ground operations in Guyana shall be in accordance with Annex 5, Table 3-4.

> (4) Means and provisions for design, procedures and training shall be established for operations in environments involving the use of standard and non-SI Units of measurement, or the transition between environments using different units, with due consideration to human performance.

PART XII **AERONAUTICAL TELECOMMUNICATIONS**

General

Applicability. 170. This Part applies to any provider of aeronautical telecommunications systems and radio-navigation services in Guyana.

Related 171. (1) The requirements of this Part must be read in Documents. conjunction with ICAO Annex 10 Volumes I to V inclusive, and ICAO Doc 8071 Volume I - Testing of Ground- Based Radio Navigation Systems. The Standards of Annex 10 Volumes I to V are applicable when providing aeronautical telecommunications systems and radio-navigation services in Guyana.

(2) In addition to these regulations the aeronautical telecommunications system and radio-navigational services provider must comply with the technical standards of annex 10 and any requirements directions and specifications set by the Authority.

172. (1) An aeronautical telecommunications system and radio-navigational services provider shall ensure that, any person authorised by the GCAA, is allowed access to its facilities and equipment.

(2) An aeronautical telecommunications system and radio-navigational services provider shall ensure that any person authorised by the Authority shall have access to any documentation relating to the safety of aircraft in flight.

(3) An aeronautical telecommunications system and radio-navigational services provider shall be responsible for ensuring that, if requested to do so, by the Authority, documentation is produced within a reasonable period of time.

Identification codes and call signs.

Authorised

Personnel.

173.(1) No person may operate –

- (a) a radio navigation aid, unless it has been allocated an identification code by ICAO and approved by the Director General; or
- (b) radio communication transmitter on an aeronautical radio frequency other than one operated as a temporary facility that does not cause any interference with any other operating aeronautical facility; and appropriate information regarding the operation of the temporary facility is forwarded to the provider of AIS for the issue of a NOTAM, and if appropriate the publication of a Supplement to the AIP; and an appropriate NOTAM has been published.

(2) An applicant for the allocation of an identification code or a call sign under paragraph (1) shall submit such

application to the Director General with, if applicable, a payment of the appropriate application fee required by the Authority.

(3) The Director General shall forward such application to ICAO.

Aeronautical Telecommunication and Radio Navigation Services and Facilities

Aeronautical Telecommunication Services - **174.** Aeronautical telecommunication services are the ground-based stations of those services defined hereunder supporting an Air Traffic Service and airborne stations are not included.

Classification

of Services.

- (a) Aeronautical Broadcasting Service. A broadcasting service intended for the transmission of information relating to air navigation.
 - (b) Aeronautical Fixed Service. A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.
 - (c) Aeronautical Fixed Telecommunication Network Service. A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communication characteristics.
 - (d) Aeronautical Telecommunication Network Service. An inter-network that allows ground, air-ground and avionics data sub-networks to inter-operate by adopting common interface services and protocols based on the International Organisation for Standardisation (ISO) Open Systems Interconnect (OSI) reference model.
 - (e) Aeronautical Mobile Service. A mobile service between aeronautical ground stations and aircraft stations, in which survival craft stations may participate; emergency

position-indicating radio-beacon stations may also participate in this service on distress and emergency frequencies. This service does not include ground stations that are provided for other than ATS purposes.

- (f) Any telecommunication service which processes or displays air traffic control data (including aviation meteorological data) for use by an ATS provider.
- (g) Electronic briefing and flight plan lodgment service for the use of pilots.

Aeronautical
Radio
Navigation175. (1) A radio navigation service intended for the
benefit, and for the safe operation of aircraft.Services -
Classification
of Services.(2) A radio navigation service includes radio
determination (surveillance services) supporting ATS.

176. The following list classifies the kinds of facilities used for the provision of aeronautical telecommunication and radio navigation services-

- (*a*) VHF air/ground voice communication facilities;
- (*b*) HF air/ground voice communication facilities;
- (c) Instrument Landing System facilities;
- (*d*) Distance Measuring Equipment;
- (e) VHF Omni-range (VOR) facilities;
- (f) Non-directional beacons (NDB);
- (g) Flight data processing facilities;
- (*h*) Flight information facilities;
- (*i*) Radar data processing facilities;
- (*j*) Primary surveillance radar facilities;
- (*k*) Secondary surveillance radar facilities;
- (*l*) Automatic dependent surveillance system facilities;
- (*m*) Voice switching and control facilities;
- (*n*) ATS point to point communication facilities;
- (o) Air/ground data links;
- (*p*) Ground to ground data inter-change networks;
- (q) Human Machine Interface systems, including Tower Consoles, ATS Work Stations, and Display facilities;

Aeronautical Telecommunication and Radio Navigation Facilities – Classification of Facilities.

- (r) Uninterruptible and emergency power supplies;
- (s) Essential services in buildings and in equipment shelters housing facilities (electrical power supplies, airconditioning, and security facilities);
- (*t*) Global Navigation Satellite System ground based augmentation stations or facilities;
- (u) Aeronautical databases used in or by a facility;
- (v) Meteorological Display Systems used for ATS;
- (w) Voice and Data Recording facilities;
- (*x*) Any other facilities supporting ATS provided.

Operational Requirements

Personnel requirements.

177. (1) An aeronautical telecommunications services provider shall employ, contract, or otherwise engage-

- (a) A senior person identified as the "chief executive" or accountable manager who
 - i. Has the authority within the providers organisation to ensure that all activities undertaken by the organisation can be financed and carried out to meet applicable operational requirements; and
 - ii. Is responsible for ensuring that the organisation complies with these requirements.
- (b) Sufficient personnel to inspect, supervise, operate and maintain the facilities listed in the providers' exposition.

(2) An aeronautical telecommunication services provider shall establish preset competency levels at all levels of staffing, and procedures to:

- (*a*) Regularly assess the competence of personnel; and
- (*b*) Maintain the competence of personnel.

Aeronautical
Facility
Requirements.178. (1) An aeronautical telecommunication services
provider shall establish procedures to ensure that-

- (a) Each aeronautical facility listed in the providers' exposition—
 - (i) Is designed, installed, and commissioned, to meet the applicable operational specification for that facility; and
 - (ii) Conforms to the applicable system characteristics and specification standards prescribed in Annexes 10 of the Chicago Convention; and
 - (iii) Operated and maintained to specification standards.
- (b) Aerodrome control towers and units providing approach and area control service shall be provided without delay with information on the operational status of radio navigation aids essential for approach, landing and take-off at the aerodrome(s) with which they are concerned; and
- (c) Each aeronautical facility listed in the providers exposition is installed with suitable power supplies and means to ensure continuity of operation appropriate to the needs of the air traffic service or radio navigation service being supported; and
- (d) Each aeronautical facility listed in the providers exposition is installed in accordance with the security program to minimise any risk of destruction,

damage, or interference with the operation of the facility; and

- (e) Any critical site area of any aeronautical facility listed in the providers exposition is:
 - (i) clearly identified on the site drawings for the aeronautical facility; and
 - (ii) physically protected by suitable signposts on the site; and
 - (iii) protected by written agreements with the site owner, aerodrome operator, and air traffic control unit, as appropriate, to ensure that site restrictions are not infringed by buildings, fences, vehicles, machinery, or aircraft.

(2) An aeronautical telecommunication services provider who intends to operate a temporary aeronautical facility to carry out site tests shall establish a procedure for conducting those tests.

(3) The procedure required under paragraph (2) shall require that:

- (*a*) The operation of the temporary facility does not cause any interference with any other operating aeronautical facility; and
- (*b*) Appropriate information regarding the operation of the temporary facility is forwarded to the provider of the AIS for the issue of a NOTAM, and if appropriate the publication of a Supplement to the AIP; and
- (c) An appropriate NOTAM has been published.

(4) Should harmful interference be detected or reported during testing of a facility, the test shall be halted immediately and not resumed again until all necessary checks have been carried to minimise the risk of interference.

Documentation and Data Control

(5) An aeronautical telecommunication services provider shall hold copies of relevant equipment manuals, technical standards, practices, instructions, forms, maintenance schedules, any document of the kind listed in Schedule 24 and any other documentation that are necessary for, or created for, the provision and operation of the facilities listed in the providers' exposition.

(6) An aeronautical telecommunication services provider shall establish a procedure for the control of the documentation required under paragraph (5) and any other applicable part of these regulations.

(7) The procedure required under paragraph (6) shall require that:

- (a) All documentation is reviewed and authorised by an appropriate senior person referred to in regulation 177 (1)(a) before issue; and
- (b) Current issues of all relevant documentation are accessible to staff at all locations if required for the provision and operation of aeronautical facilities; and
- (c) All obsolete documentation is promptly removed from all points of issue or use; and
- (d) Changes to documentation are reviewed and authorised by an appropriate senior person referred to in regulation 177 (1) (a); and
- (*e*) The current version of each item of documentation can be identified; and
- (*f*) A master copy of the current version of each item of documentation is uniquely

identifiable and securely store.

Periodic 179. (1) An aeronautical telecommunication services provider shall establish a procedure for the periodic inspection and testing of the aeronautical facilities listed in the providers' exposition to verify that each aeronautical facility meets the applicable operational requirements and performance specifications for that facility.

- (2) The procedure required under paragraph (1) shall-
 - (a) Include ground inspections and tests, and if necessary, flight tests; and
 - (b) Include the criteria for establishing or changing the interval between the periodic tests for each aeronautical facility listed in the exposition, having regard to:
 - applicable information (i) Any published by ICAO; and
 - (ii) Any applicable reliability data for the aeronautical facility; and
 - (iii) Information on the proven reliability performance of the aeronautical facility, and of other similar aeronautical facilities, stability and the of the aeronautical facility's operating environment; and
 - that (c) Ensure the grounds for establishing or changing the interval between the periodic tests for each aeronautical facility listed in the exposition are documented.

(3) An aeronautical telecommunication services provider shall establish-

> (a) A programme of periodic ground inspections for each aeronautical facility listed in the providers exposition; and

inspection and testing.

- (*b*) A programme of periodic ground tests for each aeronautical facility listed in the providers exposition; and
- (c) A programme of periodic flight tests for each radio navigation aid listed in the providers exposition unless the provider can establish from the criteria under paragraph (2)(b) that periodic ground tests can replace the periodic flight tests for the aeronautical facility without affecting the safety of air navigation.

(4) The programs required by paragraphs (3)(b) and (3)(c) shall be based on the criteria required under paragraph (2)(b) and shall specify the maximum interval between the tests for each aeronautical facility.

(5) An aeronautical telecommunication services provider shall notify the GCAA of any radio navigation aid that is not subjected to periodic flight tests.

(6) An aeronautical telecommunication services provider shall ensure that the flight inspection unit and personnel conducting flight inspection are internationally recognised and acceptable to the GCAA.

Ensuring Aeronautical Facility Performance

(7) An aeronautical telecommunication services provider shall establish a procedure to ensure that no aeronautical facility listed in the providers' exposition is released or placed into operational service unless:

- (*a*) The person releasing from or placing the aeronautical facility into operational service is assessed as competent according to the procedures required under regulation 177 (2), being a holder of a valid license with current endorsements for that facility; and
- (*b*) For placing the aeronautical facility into operational service, the appropriate checks detailed in the operating and

maintenance instructions required by regulation 185 have been carried out to verify the performance of the aeronautical facility; and that

(c) The aeronautical facility record has been completed according to the procedures required under regulation 184 (Records).

180. (1) An aeronautical measuring telecommunication services provider shall ensure that appropriate inspection, and test equipment is available for personnel to maintain the operation of each aeronautical facility listed in the providers' exposition.

(2) An aeronautical telecommunication services provider shall establish a procedure to control, calibrate, and maintain all the inspection, measuring, and test equipment required under paragraph (1) to ensure that each item of equipment has the precision and accuracy that is necessary for the measurements and tests to be performed.

(3) The procedure required under paragraph (2) shall require that each item of test equipment required for the measurement of critical performance parameters is:

- (*a*) Calibrated before use or at prescribed intervals with the calibration traceable to an appropriate national standard; and
- (*b*) Identified with a suitable indicator to show its calibration status; and
- (c) Controlled to:
 - (i) Safeguard against adjustments that would invalidate the calibration setting; and
 - (ii) Ensure that the handling, preservation, and storage of the test equipment are such that its accuracy and fitness for use is maintained.

(4) If hardware and software systems are used for the performance testing of any aeronautical facility, the procedures

Inspection measuring and test equipment. under paragraph (2) shall require the functions of those testing systems to be checked:

- (*a*) Before being released for use; and
- (*b*) At prescribed intervals to establish that those testing systems are capable of verifying the true performance of the aeronautical facility.

Notification of aeronautical facility information.

181. (1) An aeronautical telecommunication services provider shall establish a procedure to ensure that each applicable aeronautical facility listed in the applicant's exposition are informed to the AIS.

(2) The procedure required under paragraph (1) shall include a means to confirm that:

- (a) The operational details of the aeronautical facility as notified to AIS have been accurately published in the AIP; and
- (b) Any change to the operational status of the aeronautical facility has been published by NOTAM.

Post-accident or incident aeronautical facility check.

182. (1) An aeronautical telecommunication services provider shall establish a procedure to check and accurately record the operating condition of any aeronautical facility that may have been used by an aircraft, or an air traffic service, that is involved in an accident or incident.

(2) The procedure required under paragraph (1) shall require that:

- (a) The check of the aeronautical facility's operating condition is carried out as soon as practicable after notification to the aeronautical telecommunication service provider of the accident or incident; and
- (b) The record of that check, and the recorded history of the aeronautical

facility, is kept in a secure place for possible use by any subsequent accident or incident investigation; and

(c) The records secured under paragraph
 (2)(b) are retained for seven (7) years
 from the date of the last entry made on that record.

Facility183.An aeronautical telecommunicationMalfunctions.services provider shall establish procedures:

- (a) To notify, investigate, and report instances of aeronautical facility malfunctions;
- (b) To implement corrective actions to eliminate the cause of a facility malfunction incident and prevent its recurrence;
- (c) To report, repair and return to service aeronautical facility malfunctions according to the fault categorisation; and
- (d) For the release of aeronautical facility for maintenance; and
- (e) That categorise the level of importance on the restoration of facility to service; and
- (f) For the issuance of notice to airmen (NOTAM) on facility malfunctions and/or maintenance.

Records. **184.** (1) An aeronautical telecommunication services provider shall establish procedures to identify, collect, index, store, maintain, and dispose of the records that are necessary to record:

- (a) The safe provision of the services for which the certificate has been granted for; and
- (b) The safe operation of each aeronautical

facility listed in the providers' exposition.

(2) The procedures required under paragraph (1) shall require that accurate records of the following be maintained:

- (a) For each aeronautical facility, a record
 - (i) Documenting the operating performance of the aeronautical facility; and
 - (ii) Providing a history of the maintenance, and the periodic inspections and tests of the aeronautical facility, that are traceable to the person or persons responsible for each of the recorded activities; and
- (b) For each aeronautical facility, a record of the establishment of, or a change in, the periodic tests required by regulation 179 (1); and
- (c) For each item of test equipment required under regulation 180 (1) that is used for the measurement of an aeronautical facility's critical performance parameters, a record that includes a traceable history of the location, maintenance, and the calibration checks for the item of test equipment; and
- (*d*) For each facility malfunction incident reported under regulation 183, a record that includes:
 - (i) Details of the nature of the malfunction;
 - (ii) The findings of the investigation;
 - (iii) The follow up corrective actions; and

- (iv) Where applicable, a copy of the report submitted to the GCAA;
- (e) A record of each internal check; and
- (f) For each person who is licensed in accordance with regulation 177 (2), a record that includes details of the person's experience, qualifications, training, competence assessments, and current authorisations.

(3) The procedures required under paragraph (1) shall require:

- (*a*) All records to be legible and of a permanent nature; and
- (b) All aeronautical facility records required under paragraph (2)(a) to be retained for a period of at least seven (7) years unless a longer period is required:
 - (i) By the GCAA;
 - (ii) To establish a performance history for the aeronautical facility.

Operating and **185.** (1) An aeronautical telecommunication maintenance service provider shall:

- (a) Have operating and maintenance instructions that set out the requirements for operating and maintaining each aeronautical facility listed in its exposition; and
- (b) Provide the operating and maintenance instructions required under paragraph (1)(a) for the use and guidance of its personnel.

(2) The operating and maintenance instructions required under paragraph (1)(a) shall include:

- (*a*) Details of the critical performance parameters for each aeronautical facility; and
- (b) The associated minimum performance levels for those critical performance parameters referred to in paragraph (2)(a); and
- (c) Details of the test equipment required for the measurement of those critical performance parameters referred to in paragraph (2)(a); and
- (*d*) Details of the mandatory inspections and test procedures for the operational service; and
- *(e)* Details of the mandatory inspection and test procedures for the operation and maintenance of each aeronautical facility.

(3) The source of the maintenance procedures is to be made known.

Aeronautical Telecommunications System and Radio-Navigational Services Provider Training Program

Training
Program.186.A communication and navigation systems
service provider shall establish procedures and programs for
the training and assessment of all newly appointed and current
staff.

Training
Syllabus.187.A communication and navigation systems
service provider shall establish procedures to ensure that the
training programs for each course shall be comprehensive and
facilitate achievement of training goals through a syllabus,
which reflects required competencies. The syllabus must ensure
compliance with relevant national and international
requirements.

Training Delivery and Assessment. (1) Training courses for staff of the communication and navigation systems service provider shall use a method of delivery consistent with using facilities and instructors, or training officers, with current expertise and

identified qualifications appropriate to achieving the goals of the course.

(2) The method of assessment, both theoretical and practical, shall be conducted by qualified assessors using appropriate processes and facilities.

Training
Records.189.Training records of the staff of the
communication and navigation systems service provider shall
be maintained to show what competences staff possess, and to
show what training has been carried out, and the results of that
training.

Refresher **190.** Refresher training for the staff of the communication and navigation systems service provider involves periodic training and assessment of individuals performing functions in communication and navigation systems in those competencies (knowledge and skills) which are essential, but infrequently or rarely used. The content and periodicity of refresher training shall be sufficient to ensure competency.

On-going Training. **191.** The training program shall provide for ongoing training of the staff of the communication and navigation systems service provider, as necessary, to ensure that staff are competent in the use of new or emerging standards, procedures, techniques, facilities and equipment identified as essential to task performance.

Remedial **192.** The training program for the staff of the communication and navigation systems service provider shall have a process that identifies deficiencies in knowledge or application, and must have a process to ensure these deficiencies are rectified.

Qualifications of Trainers and Checkers. **193.** Persons carrying out training and/or checking functions as part of the communication and navigation systems service provider's training programme shall be appropriately qualified for these functions.

SCHEDULE 1

AIR TRAFFIC SERVICES

PART A

(Regulation 23)

General

The following are the standards required to be met by the Authority in respect of the organisation, designation of airspace and air traffic service safety management programmes:

Objectives of the Air Traffic Services

- 1. The objectives of the ATS shall be to
 - (*a*) prevent collisions between aircraft;
 - (*b*) prevent collisions between aircraft on the maneuvering area and obstructions on that area;
 - (c) expedite and maintain an orderly flow of air traffic;
 - (*d*) provide advice and information useful for the safe and efficient conduct of flights; and
 - *(e)* notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.

Divisions of the Air Traffic Services

2. Air traffic services shall comprise three (3) services identified as follows:

- (*a*) an air traffic control service: to accomplish the objectives required at paragraphs 1(*a*), (*b*) and (*c*) divided in three (3) parts as follows:
 - (i) Area control service: the provision of air traffic control service for controlled flights, except for

those parts of such flights described in subparagraphs (ii) and (iii), in order to accomplish the objectives in paragraph 1(*a*) and (*c*);

- (ii) Approach control service: the provision of air traffic control service for those parts of controlled flights associated with arrival or departure, in order to accomplish the objectives in paragraphs 1(*a*) and (*c*);
- (iii) Aerodrome control service: the provision of air traffic control service for aerodrome traffic, except for those parts of flights described in paragraph 2, in order to accomplish the objectives in paragraphs 1(*a*), (*b*), and (*c*);
- (*b*) a flight information service: to accomplish the objective in paragraph 1(*d*); and
- (c) an alerting service to accomplish objective in paragraph 1(e).

Determination of the Need for Air Traffic Services

3. (1) The need for the provision of ATS shall be determined by considering the following requirements:

- (*a*) the types of air traffic involved;
- (*b*) the density of air traffic;
- (c) the meteorological conditions; and
- (*d*) such other factors as may be relevant.

(2) The carriage of ACAS by aircraft in a given area shall not be a factor in determining the need for ATS in that area.

Designation of the Portions of the Airspace and Controlled Aerodromes where Air Traffic Services will be Provided

4. (1) Where it has been determined that ATS will be provided in a particular portion of an airspace or at a particular aerodrome, then that portion of the airspace or that aerodrome shall be designated in relation to the ATS that are to be provided.

(2) The designation of a particular portion of an airspace or a particular aerodrome shall be as follows:

- (a) flight information regions: those portions of the airspace where it is determined that flight information service and alerting service will be provided shall be designated as flight information regions;
- (*b*) control areas and control zones:
 - that portions of an airspace where it is deter-mined that air traffic control service will be pro-vided to IFR flights shall be designated as control areas or control zones;
 - (ii) that portions of controlled airspace where it is determined that air traffic control service will also be provided to VFR flights shall be designated as Classes B, C, or D airspace; and
 - (iii) where designated within a flight information region, control areas and control zones shall form part of that flight information region; and

Note: The distinction between control areas and control zones is made in clause 9.

(*c*) controlled aerodromes: those aerodromes where it is determined that air traffic control services will be provided to aerodrome traffic shall be designated as controlled aerodromes.

Classification of Airspaces

5. (1) ATS airspaces shall be classified and designated as appropriate to the needs of Guyana and the airspace for which the Authority is responsible in accordance with the following as applicable:

- (a) Class A: only IFR flights are permitted, and all flights are provided with air traffic control service and are separated from each other;
- (b) Class B: IFR and VFR flights are permitted, and all flights are provided with air traffic control service and are separated from each other;
- (c) Class C:

- (i) IFR and VFR flights are permitted, and all flights are provided with air traffic control service;
- (ii) IFR flights are separated from other IFR flights and from VFR flights; and
- (iii) VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights;
- (d) Class D:
 - (i) IFR and VFR flights are permitted and all flights are provided with air traffic control service;
 - (ii) IFR flights are separated from other IFR flights and receive traffic information in respect of VFR flights; and
 - (iii) VFR flights receive traffic information in respect of all other flights;
- (e) Class E:
 - (i) Class E shall not be used for control zones;
 - (ii) IFR and VFR flights are permitted and IFR flights are provided with air traffic control service and are separated from other IFR flights; and
 - (iii) All flights receive traffic information as far as is practical;
- (f) Class F:
 - (i) IFR and VFR flights are permitted and all participating IFR flights receive an air traffic advisory service; and
 - (ii) all flights receive flight information service if requested;
- (g) Class G:
 - (i) IFR and VFR flights are permitted and receive flight information service if requested; and
- (ii) the requirements for flights within each class of airspace shall be as shown in the table in Schedule 5.
- Note: When the ATS airspaces adjoin vertically, one above the other, flights at a common level would comply with requirements of, and be given services applicable to, the less restrictive class of airspace. In applying these criteria, Class B airspace is therefore considered less restrictive than Class A airspace and Class C airspace less restrictive than Class B airspace and so on.

Performance-Based Navigation (PBN) Operations

6. (1) When applicable, the navigation specification(s) for designated areas, tracks or ATS routes shall be prescribed on the basis of regional air navigation agreements. In designating a navigation specification, limitations may apply as a result of navigation infrastructure constraints or specific navigation functionality requirements.

(2) Performance-based navigation operations shall be implemented as soon as practicable.

(3) The prescribed navigation specification shall be appropriate to the level of communications, navigation and ATS provided in the airspace concerned as prescribed in the ICAO Doc 9613 — *Performance Based Navigation Manual*.

Required Communication Performance (RCP)

7. (1) Required communication performance shall be prescribed by the Authority on the basis of regional air navigation agreements.

(2) The required communication performance type prescribed by the Authority shall be appropriate to the ATS provided in the airspace concerned.

Note: Applicable RCP types and associated procedures are published in the Manual of Required Communication Performance (Doc 9869).

Establishment and Designation of the Units Providing Air Traffic Services

8. Units shall be established and designated to provide air traffic services as follows:

(a) flight information centres to provide flight information service and alerting service within flight information regions, unless the responsibility of providing such services within a flight information region is assigned to an air traffic control unit having adequate facilities for the discharge of such responsibility; and

(*b*) air traffic control units to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

Specifications for Flight Information Regions, Control Areas and Control Zones

9. (1) The delineation of airspace, wherein air traffic services are to be provided, shall be related to the nature of the route structure and the need for efficient service rather than to national boundaries.

(2) Specification for flight information regions shall be as follows:

- (*a*) flight information regions shall be delineated to cover the whole of the air route structure to be served by such regions;
- (*b*) a flight information region shall include all airspace within its lateral limits, except as limited by an upper flight information region; and
- (c) where a flight information region is limited by an upper flight information region, the lower limit specified for the upper flight information region shall constitute the upper vertical limit of the flight information region and coincide with a VFR cruising level provided in the tables in *Schedule 7* of the *Civil Aviation (Operations) Regulations.*
- (3) Specification for control areas shall be as follows:
 - (a) control areas including airways and terminal control areas shall be delineated so as to encompass sufficient airspace to contain the flight paths of IFR flights or portions thereof to which it is desired to provide the applicable parts of the air traffic control service, taking into account the capabilities of the navigation aids normally used in that area;
 - (*b*) a lower limit of a control area shall be established at a height above the ground or water of not less than two hundred metres (200 m) or seven hundred feet (700 ft);
 - (c) The lower limit of a control area shall, when practicable and desirable in order to allow freedom of action for VFR flights below the control area, be established at a greater height than the minimum specified in (b).

- (*d*) When the lower limit of a control area is above 900 m (3 000 ft) MSL it shall coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.
- Note. This implies that the selected VFR cruising level be such that expected local atmospheric pressure variations do not result in a lowering of this limit to a height of less than 200 m (700 ft) above ground or water.
- (e) an upper limit of a control area shall be established where either
 - (iii) air traffic control service will not be provided above such upper limit; or
 - (ii) the control area is situated below an upper control area, in which case the upper limit shall coincide with the lower limit of the upper control area; and
- (f) the upper limit at subparagraph (c)(ii), shall coincide with a VFR cruising level provided in the tables in *Schedule* 7 of the *Civil Aviation (Operations) Regulations;*

(4) Specification for flight information regions or control areas in the upper airspace shall be as follows:

- (a) Where it is desirable to limit the number of flight information regions or control areas through which high flying aircraft would otherwise have to operate, a flight information region or control area, as appropriate, shall be delineated to include the upper airspace within the lateral limits of a number of lower flight information regions or control areas.
- (5) Specification for control zones shall be as follows:
 - (a) lateral limits of control zones shall encompass at least those portions of the airspace which are not within control areas containing the paths of IFR flights arriving at and departing from aerodromes to be used under IMC;
 - (*b*) lateral limits of a control zone shall extend to at least 9.3 kilometres or five (5) nautical miles from the centre of the aerodrome concerned in the directions from which approaches may be made; and

- *(c)* where a control zone is located within the lateral limits of a control area, the control shall extend upwards from the surface of the earth to at least the lower limit of the control zone area.
- (*d*) If a control zone is located outside of the lateral limits of a control area, an upper limit shall be established.
- (*e*) If it is desired to establish the upper limit of a control zone at a level higher than the lower limit of the control area established above it, or if the control zone is located outside of the lateral limits of a control area, its upper limit shall be established at a level which can easily be identified by pilots. When this limit is above 900 m (3 000 ft) MSL it shall coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.

Identification of Air Traffic Services Units and Airspaces

10.(1) An area control centre or flight information centre shall be identified by the name of a nearby town or city or geographic feature.

(2) An aerodrome control tower or approach control unit shall be identified by the name of the aerodrome at which it is located.

(3) A control zone, control area or flight information region shall be identified by the name of the unit having jurisdiction over such airspace.

Establishment and Identification of Air Traffic Services Routes

11.(1) Where ATS routes are established, a protected airspace along each air traffic services route and a safe spacing between adjacent air traffic services routes shall be provided.

(2) When warranted by density, complexity or nature of the traffic, special routes shall be established for use by low-level traffic, including helicopters operating to and from helidecks on the high seas. When determining the lateral spacing between such routes, account shall be taken of the navigational means available and the navigation equipment carried on board helicopters.

(3) ATS routes shall be identified by designators.

(4) Designators for ATS routes other than standard departure and arrival routes shall be selected in accordance with the principles prescribed in Schedule 2.

(5) Standard departure and arrival routes and associated procedures shall be identified in accordance with the principles prescribed in Schedule 4.

Establishment of Change-Over Points

12. Change-over points shall be established on ATS route segments defined by reference to very high frequency omnidirectional radio ranges where this will assist accurate navigation along the route segments. The establishment of change-over points shall be limited to route segments of 110 km (60 NM) or more, except where the complexity of ATS routes, the density of navigation aids or other technical and operational reasons warrant the establishment of change-over points on shorter route segments.

13. Unless otherwise established in relation to the performance of the navigation aids or frequency protection criteria, the change-over point on a route segment shall be the mid-point between the facilities in the case of a straight route segment or the intersection of radials in the case of a route segment which changes direction between the facilities.

Establishment and Identification of Significant Points

14.(1) Significant points shall be established for the purpose of defining an ATS route or instrument approach procedure and in relation to the requirements of ATS for information regarding the progress of aircraft in flight.

(2) Significant points shall be identified by designators.

(3) Significant points shall be established and identified in accordance with the principles prescribed in Schedule 3.

Coordination between the Operator and Air Traffic Services

15.(1) ATS units, in carrying out their objectives, shall have due regard to the requirements of the operators consequent on their obligations as prescribed in the *Civil Aviation (Operations) Regulations* and the *Civil Aviation (Air Operator Certification and Administration) Regulations*, and where required by the operators, make available to them or their designated representatives such information as may be available to enable the operators or their designated representatives to carry out their responsibilities.

(2) Where so requested by an operator, messages including position reports received by ATS units and relating to the operation of an aircraft for which operational control service is provided by that operator shall, so far as practicable, be made available immediately to the operator or a designated representative in accordance with agreed procedures.

Coordination between Military Authorities and Air Traffic Services

16. (1) ATS authorities shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft.

(2) Coordination of activities potentially hazardous to civil aircraft shall be effected in accordance with clause 17.

(3) Arrangements shall be made to permit information relevant to the safe and expeditious conduct of flights of civil aircraft to be promptly exchanged between ATS units and appropriate military units.

(4) ATS units shall, either routinely or on request, in accordance with agreed procedures, provide appropriate military units with pertinent flight plan and other data concerning flights of civil aircraft.

(5) In order to eliminate or reduce the need for interceptions, ATS authorities shall designate any areas or routes where the requirements of the *Civil Aviation* (*Operations*) *Regulations*, concerning flight plans, two-way communications and position reporting apply to all flights to ensure that all pertinent data is available in appropriate ATS units specifically for the purpose of facilitating identification of civil aircraft.

(6) Special procedures shall be established in order to ensure that -

- (a) ATS units are notified where a military unit observes that an aircraft which is or might be a civil aircraft is app-roaching, or has entered any area in which interception might become necessary; and
- (*b*) all possible efforts are made to confirm the identity of the aircraft and to provide it with the navigational guidance necessary to avoid the need for interception.

Coordination of Activities Potentially Hazardous to Civil Aircraft

17.(1) The arrangements for activities potentially hazardous to civil aircraft, whether over the territory of Guyana or over the high seas, shall be coordinated with the appropriate ATS authorities.

(2) The coordination of activities under sub-clause (1), shall be effected early enough to permit timely promulgation of information regarding the activities in accordance with the standards prescribed in Schedule 8. **18.** If the appropriate ATS authority is not that of the State where the organisation planning the activities is located, initial coordination shall be effected through the ATS authority responsible for the airspace over the State where the organisation is located.

19. The objective of the coordination shall be to achieve the best arrangements which will avoid hazards to civil aircraft and minimise interference with the normal operations of such aircraft.

20. In determining these arrangements the following shall be applied:

- (a) the locations or areas, times and durations for the activities shall be selected to avoid closure or realignment of established ATS routes, blocking of the most economic flight levels, or delays of scheduled aircraft operations, unless no other options exist;
- (*b*) the size of the airspace designated for the conduct of the activities shall be kept as small as possible;
- (c) direct communication between the appropriate ATS authority or air traffic services unit and the organisation or unit conducting the activities shall be provided for use in the event that civil aircraft emergencies or other unforeseen circumstances require discontinuation of the activities.

21. The appropriate air traffic services authorities shall be responsible for initiating the promulgation of information regarding coordination of activities.

22.(1) If activities potentially hazardous to civil aircraft take place on a regular or continuing basis, special committees shall be established as required to ensure that the requirements of all parties concerned are adequately coordinated.

(2) Adequate steps shall be taken to prevent emission of laser beams from adversely affecting flight operations.

(3) In order to provide added airspace capacity and to improve efficiency and flexibility of aircraft operations, States shall establish procedures providing for a flexible use of airspace reserved for military or other special activities. The procedures shall permit all airspace users to have safe access to such reserved airspace.

Aeronautical Data

23. (1) Determination and reporting of ATS related aeronautical data shall be in accordance with the accuracy and integrity requirements prescribed in Tables 1 to 5 in Schedule 6 while taking into account the established quality system procedures.

(2) Accuracy requirements for aeronautical data are based upon a ninety-five percent (95%) confidence level, and in that respect three (3) types of positional data shall be identified as follows:

- (a) surveyed points such as navigation aids positions;
- (*b*) calculated points such as mathematical calculations from the known surveyed points of points in space or fixes; and
- (c) declared points such as flight information region boundary points;

(3) The Authority shall ensure that integrity of aeronautical data is maintained throughout the data process from survey and origin to the next intended user.

(4) Aeronautical data integrity requirements shall be based upon the potential risk resulting from corruption of data and upon the use to which the data item is put, consequently, the following classifications and data integrity levels shall apply:

- (*a*) critical data, integrity level 1 x 10⁻⁸ in which there is a high probability when using corrupted critical data;
- (b) essential data, integrity level $1 \ge 10^{-5}$ in which there is a low probability when using corrupted essential data; and
- (c) routine data, integrity level 1 x 10⁻³ in which 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.

(5) Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the CRC check.

(6) To achieve protection of the integrity level of critical and essential aeronautical data as classified in paragraphs (4) (a) and (b), a 32-bit or 24-bit cyclic redundancy check algorithm shall apply respectively.

(7) Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information services in terms of the WGS-1984 (WGS-84) geodetic reference datum, identifying those geographical coordinates which have been transformed into WGS-84 coordinates by mathematical means where the whole accuracy of original field work does not meet the requirements in Table 1 of Schedule 6.

(8) The order of accuracy of the field work and determinations and calculations derived shall be such that the resulting operational navigation data for the phases of flight will be within the maximum deviations for an appropriate reference frame, as indicated in the tables contained in Schedule 6.

Coordination between Meteorological and Air Traffic Services Authorities

24.(1) To ensure that aircraft receive the most up-to-date meteorological information for aircraft operations, arrangements shall be made, where necessary, between meteorological and ATS authorities for ATS personnel—

- (*a*) in addition to using indicating instruments, to report, if observed by ATS personnel or communicated by aircraft, such other meteorological elements as may be agreed upon;
- (b) to report as soon as possible to the associated meteorological office, meteorological phenomena of operational significance, if observed by ATS personnel or communicated by aircraft, which have not been included in the aerodrome meteorological report;
- (c) to report as soon as possible to the associated meteorological office
 - (i) pertinent information concerning pre-eruption volcanic activity;
 - (ii) volcanic eruptions; and
 - (iii) information concerning volcanic ash cloud; and
- (*d*) area control centres and flight information centres shall report the information to the associated meteorological watch office and volcanic ash advisory centres.
- (2) Close coordination shall be maintained among -
 - (*a*) area control centres;

- (b) flight information centres; and
- (*c*) associated meteorological watch offices, to ensure that information on volcanic ash included in NOTAM and SIGMET messages is consistent.

Coordination between Aeronautical Information Services and Air Traffic Services

25. (1) To ensure that the aeronautical information service unit provides up-to-date pre-flight information and to meet the need for in-flight information, the ATS units shall report the following to the aeronautical information service unit with a minimum of delay:

- (*a*) information on aerodrome conditions;
- (b) the operational status of associated facilities, services and navigation aids within the units' respective area of responsibility;
- (*c*) the occurrence of volcanic activity observed by ATS personnel or reported by aircraft; and
- (*d*) any other information considered to be of operational significance.

(2) Before introducing changes to the air navigation system the ATS units responsible for such changes shall take into account the time needed by the aeronautical information service for the preparation, production and issue of relevant material for promulgation.

(3) When submitting the raw information or data to aeronautical information services the ATS shall—

- (*a*) observe the predetermined, internationally agreed AIRAC system effective dates in addition to fourteen (14) days postage time; and
- (*b*) take into account accuracy and integrity requirements for aeronautical data as prescribed to this Schedule.
- Note 1: To ensure timely provision of the information to the aeronautical information service, close coordination between those services concerned is required.
- Note 2: Of particular importance are changes to aeronautical information that affect charts and computer-based navigation systems which qualify to be notified by the AIRAC system, as prescribed in Schedule 14.

Minimum Flight Altitudes

26. The minimum flight altitudes shall be determined and promulgated for each ATS route and control area and in the airspace over Guyana and shall provide a minimum clearance above the controlling obstacle.

Service to Aircraft where there is an Emergency

- 27. (1) Unlawful interference
 - (a) An aircraft known or believed to be in a state of emergency, including being subjected to an act of unlawful interference, shall be given maximum consideration, assistance and priority over other aircraft as may be necessitated by the circumstances.

Note: To indicate than an aircraft is in a state of emergency, an aircraft equipped with an appropriate data link capability or an SSR transponder might operate as follows:

- i. on Mode A, Code 7700; or
- ii. on Mode A, Code 7500 to indicate specifically that it is being subjected to an act of unlawful interference;
- iii. activate the appropriate emergency or urgency capability of ADS-B or ADS-C; and
- iv. transmit the appropriate emergency message via CPDLC.
- (*b*) In communications between ATS units and aircraft in the event of an emergency, Human Factors principles shall be observed.
- (*c*) When an occurrence of an act of unlawful interference with an aircraft occurs or is suspected, ATS units shall attend promptly to requests made by the aircraft.
- (d) Information pertinent to the safe conduct of the flight of an aircraft subjected to an act of unlawful interference shall continue to be transmitted and appropriate action taken to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft.

(e) When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall, in accordance with locally agreed procedures, immediately inform the appropriate authority designated by the State and exchange necessary information with the operator or its designated representative.

Note 1: A strayed or unidentified aircraft may be suspected as being the subject of unlawful Interference

Note 2: Procedures relating to the handling of strayed or unidentified aircraft are contained in clause 28.

Note 3: PANS-ATM (Doc 4444), Chapter 15, 15.1.3 contains more specific procedures related to unlawful interference.

- (2) Aircraft Bomb threat -
 - (a) Whenever a bomb threat warning has been received, ATS units shall promptly attend to requests by, or to anticipated needs of, the aircraft, including requests for relevant information relating to air navigation facilities, procedures and services along the route of flight and at any aerodrome of intended landing, and shall take such action as is necessary to expedite the conduct of all phases of the flight.
 - i. ATS units shall also:
 - A. transmit, and continue to transmit, information pertinent to the safe conduct of the flight, without expecting a reply from the aircraft;
 - B. monitor and plot the progress of the flight with the means available, and coordinate transfer of control with adjacent ATS units without requiring transmissions or other responses from the aircraft, unless communication with the aircraft remains normal;
 - C. inform, and continue to keep informed, appropriate ATS units, including those in adjacent FIRs, which may be concerned with the progress of the flight;

Note. — In applying this provision, account must be taken of all the factors which may affect the progress of the flight, including fuel endurance and the possibility of sudden changes in route and destination. The objective is to provide, as far in advance as is practicable in the circumstances, each ATS unit with appropriate information as to the expected or possible penetration of the aircraft into its area of responsibility.

- D. notify:
 - the operator or its designated representative;
 - the appropriate rescue coordination centre in accordance with appropriate alerting procedures;
 - the appropriate authority designated by the State;

Note. — It is assumed that the designated security authority and/or the operator will in turn notify other parties concerned in accordance with preestablished procedures.

Note.— These messages include, but are not limited to: initial messages declaring an incident; update messages on an existing incident; messages containing decisions made by appropriate decision makers; messages on transfer of responsibility; messages on acceptance of responsibility; messages indicating that an entity is no longer involved in an incident; and messages closing an incident.

ii. The following additional procedures shall apply if a threat is received indicating that a bomb or other explosive device has been placed on board a known aircraft. The ATS unit receiving the threat information shall:

- A. if in direct communication with the aircraft, advise the flight crew without delay of the threat and the circumstances surrounding the threat; or
- B. if not in direct communication with the aircraft, advise the flight crew by the most expeditious means through other ATS units or other channels.
- iii. The ATS unit in communication with the aircraft shall ascertain the intentions of the flight crew and report those intentions to other ATS units which may be concerned with the flight.
- iv. The aircraft shall be handled in the most expeditious manner while ensuring, to the extent possible, the safety of other aircraft and that personnel and ground installations are not put at risk.
- v. Aircraft in flight shall be given re-clearance to a requested new destination without delay. Any request by the flight crew to climb or descend for the purpose of equalising or reducing the differential between the outside air pressure and the cabin air pressure shall be approved as soon as possible.
- vi. An aircraft on the ground shall be advised to remain as far away from other aircraft and installations as possible and, if appropriate, to vacate the runway. The aircraft shall be instructed to taxi to a designated or isolated parking area in accordance with local instructions. Should the flight crew disembark passengers and crew immediately, other aircraft, vehicles and personnel shall be kept at a safe distance from the threatened aircraft.
- vii. ATS units shall not provide any advice or suggestions concerning action to be taken by the flight crew in relation to an explosive device.
- viii. An aircraft known or believed to be the subject of unlawful interference or which for other reasons needs isolation from normal aerodrome activities shall be cleared to the designated isolated parking position. Where such an isolated parking position has not been designated, or if the designated position is

not available, the aircraft shall be cleared to a position within the area or areas selected by prior agreement with the aerodrome authority. The taxi clearance shall specify the taxi route to be followed to the parking position. This route shall be selected with a view to minimising any security risks to the public, other aircraft and installations at the aerodrome.

Note. — See Annex 14, Volume I, Chapter 3.

(3) Emergency descent -

- (a) General upon receipt of advice that an aircraft is making an emergency descent through other traffic, all possible action shall be taken immediately to safeguard all aircraft concerned. When deemed necessary, air traffic control units shall immediately broadcast by means of the appropriate radio aids, or if not possible, request the appropriate communications stations immediately to broadcast an emergency message.
- (*b*) Action by the Pilot-in-Command It is expected that aircraft receiving such a broadcast will clear the specified areas and stand by on the appropriate radio frequency for further clearances from the air traffic control unit.
- (c) Subsequent Action by the Air Traffic Control Unit immediately after such an emergency broadcast has been made the ACC, the approach control unit, or the aerodrome control tower concerned shall forward further clearances to all aircraft involved as to additional procedures to be followed during and subsequent to the emergency descent. The ATS unit concerned shall additionally inform any other ATS units and control sectors which may be affected.

In-Flight Contingencies for Strayed, Unidentified and Intercepted Aircraft

28. (1) As soon as an ATS unit becomes aware of a strayed aircraft, the ATS unit shall—

(*a*) where the aircraft position is not known, take all the necessary steps to assist the aircraft and to safeguard its flight as follows:

- i. attempt to establish two-way communication with the aircraft, unless such communication already exists;
- ii. use all available means to determine its position;
- iii. inform other ATS units into whose area the aircraft may have strayed or may stray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;
- iv. inform, in accordance with locally agreed procedures, appropriate military units and provide them with pertinent flight plan and other data concerning strayed aircraft; and
- v. request from the units referred to in (iii) and (iv) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position; and
- (*b*) when the position of the aircraft is established take all the necessary steps as follows
 - i. advise the aircraft of its position and corrective action to be taken; and
 - ii. provide, as necessary, other ATS units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft.

(2) As soon as an ATS unit becomes aware of an unidentified aircraft in its area, the ATS unit shall -

- (a) endeavour to establish the identity of the aircraft where this is necessary for the provision of ATS or required by the appropriate military authorities in accordance with locally agreed procedures;
- (*b*) take such of the following steps as appropriate to establish the identity of the aircraft:
 - i. attempt to establish two-way communication with the aircraft;

- ii. inquire of other ATS units within the flight information region about the flight and request their assistance in establishing two-way communication with the aircraft;
- iii. inquire of ATS units serving the adjacent flight information regions about the flight and request their assistance in establishing two-way communication with the aircraft; and
- iv. attempt to obtain information from other aircraft in the area; and
- (*c*) immediately inform the appropriate military unit when the identity of the aircraft has been established.

(3) An ATS unit that considers that a strayed or unidentified aircraft may be the subject of unlawful interference shall immediately inform the appropriate authority designated by the Authority, in accordance with locally agreed procedures.

(4) As soon as an ATS unit becomes aware that an aircraft is being intercepted -

- (*a*) in its area of responsibility, the ATS shall take such of the following steps as are appropriate:
 - i. attempt to establish two-way communication with the intercepted aircraft via any means available, including the emergency radio frequency 121.5 MHz, unless such communication already exists;
 - ii. inform the pilot of the intercepted aircraft of the interception;
 - iii. establish contact with the intercept control unit maintaining two-way communication with the intercepting aircraft and provide intercept control unit with available information concerning the aircraft;
 - relay messages between the intercepting aircraft or the intercept control unit and the intercepted aircraft, as necessary;

- v. in close coordination with the intercept control unit take all necessary steps to ensure the safety of the intercepted aircraft; and
- vi. inform air traffic services units serving adjacent flight information regions if it appears that the aircraft has strayed from an adjacent flight information regions; and
- (*b*) outside its area of responsibility, the ATS shall take such of the following steps as are appropriate:
 - i. provide the ATS unit serving the airspace in which the interception is taking place, with available information that will assist in identifying the aircraft and request that action be taken in accordance with paragraph (4)(*a*); and
 - ii. relay messages between the intercepted aircraft and the appropriate ATS unit, the intercept control unit or the intercepting aircraft.

Time Standards Requirements in Air Traffic Services

29. (1) ATS units shall use time in UTC and shall express the time in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

(2) ATS units shall be equipped with clocks clearly visible from each operating position in the unit concerned indicating the time in hours, minutes and seconds.

(3) ATS unit clocks and other time recording devices shall be adjust-ted as necessary to maintain correct time within plus or minus thirty (30) seconds of UTC.

(4) Where data link communications are utilised by an ATS unit, clocks and other time-recording devices shall be adjusted as necessary to maintain correct time to within one (1) second of UTC.

(5) UTC time shall be obtained from a standard time station or, where this is not possible, from another unit which has obtained UTC time from such station.

(6) Aerodrome control towers shall, prior to an aircraft taxiing for takeoff, provide the pilot with the correct time, unless arrangements have been made for the pilot to obtain the correct time from other sources;

(7) ATS units shall –

- (a) provide aircraft with the correct time on request; and
- (*b*) give time checks to the nearest half minute.

Requirements for Carriage and Operation of Pressure-Altitude Reporting Transponders

30. Requirements for carriage and operation of pressure-altitude reporting transponders within defined portions of airspace shall be established as prescribed in the Civil Aviation Instruments and Equipment Regulations.

Air Traffic Services Safety Management

31.(1) The ATS safety management system shall include:

- (*a*) identification of safety hazards;
- (*b*) ensures the implementation of remedial action necessary to maintain agreed safety performance;
- (*c*) providing for continuous monitoring and regular assessment of the safety performance; and
- (*d*) aims at a continuous improvement of the overall performance of the safety management system.

(2) A safety management system shall clearly define lines of safety accountability throughout the Authority including a direct accountability for safety on the part of as set out in Schedule 7.

(3) Any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted.

(4) Where appropriate, the Director General shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.

Common Reference Systems

32. (1) The standard for horizontal reference system shall be the WGS-84-

(*a*) for air navigation; and

(*b*) for reporting aeronautical geographical coordinates indicating latitude and longitude;

(2) The standard for vertical reference system for air navigation shall be the mean sea level datum, which gives the relationship of gravity-related height or elevation to a surface known as the geoid.

Note: The geoid globally must closely approximate MSL. It is defined as the equipotential surface in the gravity field of the earth which coincides with the undisturbed MSL extended continuously through the continents.

(3) The standard for temporal reference system for air navigation shall be the Gregorian calendar and UTC.

(4) Where a different temporal reference system is used, this shall be indicated in the AIP as prescribed in Schedule 8.

Language Proficiency

33. Air traffic controllers shall speak and understand the English language as prescribed for radiotelephony communications as prescribed in the *Civil Aviation (General Application and Personnel Licensing) Regulations.*

Contingency Arrangements

34. Air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed with the assistance of ICAO as necessary, in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

Identification and Delineation of Prohibited, Restricted and Danger Areas

35.(1) Each prohibited area, restricted area, or danger area established, shall, upon initial establishment, be given an identification and full details shall be promulgated.

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

(3) The identification shall be composed of a group of letters and figures as follows:

- (*a*) nationality letters for location indicators assigned to the State or territory which has established the airspace;
- (*b*) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and
- (c) a number, unduplicated within the State or territory concerned

36.To avoid confusion, identification numbers shall not be reused for a period of at least one (1) year after cancellation of the area to which they refer.

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

PART B

[Regulation 23 (2) and (5)]

AIR TRAFFIC CONTROL SERVICE

The standards required to be met for air traffic control services are as follows:

Provision of Air Traffic Control Service

1. The parts of air traffic control service described in paragraph 2(a) of Part A shall be provided by the applicable units as follows:

- (*a*) area control service:
 - (i) by an area control centre; or
 - (ii) by the unit providing approach control service in a control zone or in a control area of limited extent which is designated primarily for the provision of approach control service and where no area control centre is established;

- (*b*) approach control service:
 - (i) by an aerodrome control tower or area control centre when it is necessary or desirable to com-bine under the responsibility of one (1) unit the functions of the approach control service with those of the aerodrome control service or the area control service; or
 - (ii) by an approach control unit when it is necessary or desirable to establish a separate unit; and
- (c) aerodrome control service: by an aerodrome control tower.

Operation of Air Traffic Control Service

2. (1) To provide air traffic control service, an air traffic control unit shall—

- (*a*) be provided with information
 - (i) on the intended movement of each aircraft, or variations of information on the intended movement, and
 - (ii) current information on the actual progress of each aircraft;
- (*b*) determine from the information received, the positions of known aircraft relative to each other;
- (*c*) issue clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic; and
- (d) coordinate clearances as necessary with other ATC units-
 - (i) whenever an aircraft might otherwise conflict with traffic operated under the control of such other units; and
 - (ii) before transferring control of an aircraft to other ATC units.

(2) Information on aircraft movements, together with a record of ATC clearances issued to those aircraft, shall be displayed in a manner that will permit

ready analysis in order to maintain an efficient flow of air traffic with adequate separation between aircraft.

(3) Air traffic control units shall be equipped with devices that record background communication and the aural environment at air traffic controller work stations, capable of retaining the information recorded during at least the last twenty-four (24) hours of operation.

(4) Clearances issued by ATC units shall provide separation between -

- (a) all flights in airspace Classes A and B;
- (b) IFR flights in airspace Classes C, D and E;
- (c) IFR flights and VFR flights in airspace Class C;
- (d) IFR flights and special VFR flights; and

(5) Separation by an ATC unit shall be obtained by at least one (1) of the following:

- (*a*) vertical separation, obtained by assigning different levels selected from—
 - (i) the appropriate table of cruising levels in *Schedule* 7 of the *Civil Aviation (Operations) Regulations;* or
 - (ii) a modified table of cruising levels, when so prescribed in Accordance with Schedule 7 of the Civil Aviation (Operations) Regulations, for flight above FL 410, except that the correlation of levels to track as prescribed in sub-paragraphs (i) and (ii) shall not apply where otherwise indicated in appropriate aeronautical information publications or air traffic control clearances;
- (b) horizontal separation, obtained by providing
 - longitudinal separation, by maintaining an interval between aircraft operating along the same, converging or reciprocal tracks expressed in time or distance; or
 - (ii) lateral separation, by maintaining aircraft on different routes or in different geographical areas; and

(c) composite separation applied only on the basis of regional air navigation agreements, consisting of a combination of vertical separation and one of the other forms of separation contained in paragraph 4(*b*), using minima for each which may be lower than, but not less than half of, those used for each of the combined elements when applied individually;

(6) For all airspace where a reduced vertical separation minimum of three hundred metres (300 m) or one thousand feet (1,000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the implementation and continued application of this vertical separation minimum meets the safety objectives;

(7) The coverage of the height-monitoring facilities provided under the programme under sub-clause (5), shall be adequate to permit monitoring of the relevant aircraft types of all operators that operate in RVSM airspace.

Note: The number of separate monitoring programmes shall be restricted to the minimum necessary to effectively provide the required services for the region.

(8) Arrangements shall be made for the sharing of data from monitoring programmes through inter-regional agreement;

Separation Minima

3. (1) The selection of separation minima for application within a given portion of airspace shall be as follows:

- (a) the separation minima shall be selected from those prescribed by the provisions of the PANS-ATM (Doc. 4444) and the Regional Supplementary Procedures (Doc. 7030) as applicable under the prevailing circumstances except that, where types of aids are used or circumstances prevail which are not covered by current provisions of the Chicago Convention, other separation minima shall be established as necessary by—
 - the Authority, following consultation with operators, for routes or portions of routes contained within the airspace that is the responsibility of Guyana; and
 - (ii) regional air navigation agreements for routes or portions of routes contained within airspace over

the high seas or over areas of undetermined sovereignty; and

- (*b*) the selection of separation minima shall be made in consultation between the Authority and the appropriate ATS authorities responsible for the provision of ATS in adjacent airspace when—
 - (i) traffic will pass into an adjacent airspace; and
 - (ii) routes are closer to the common boundary of an adjacent airspace than the separation minima applicable in the circumstances.
- Note: The purpose of this provision is to ensure, in the first case, compatibility on both sides of the line of transfer of traffic, and, in the other case, adequate space between aircraft operating on both sides of the common boundary.

(2) Details of the selected separation minima and the associated areas of application shall be provided —

- (i) to the ATS units concerned; and
- (ii) to pilots and operators through aeronautical information publications, where separation is based on the use by aircraft of specified navigation aids or specified navigation techniques.

Responsibility for Control of Aircraft

4. (1) A controlled flight shall be under the control of only one (1) air traffic control unit at any given time.

(2) Responsibility for the control of all aircraft operating within a given block of airspace shall be vested in a single air traffic control unit;

(3) Notwithstanding sub-clause (2) control of an aircraft or groups of aircraft may be delegated to other ATC units provided that coordination between the ATC units concerned is assured.

Place or Time of Transfer of Responsibility for Control of Aircraft

5. The place or time of the transfer of responsibility for the control of an aircraft shall be made from one (1) air traffic control unit to another air traffic control unit as follows:

- (a) between two (2) units providing area control service: responsibility for the control of an aircraft shall be transferred from a unit providing area control service in a control area to the unit providing area control service in an adjacent control area at the time of crossing the common control area boundary as estimated by the area control centre having control of the aircraft or at such other point or time as agreed between the two (2) units;
- (b) between a unit providing area control service and a unit providing approach control service: responsibility for the control of an aircraft shall be transferred between a unit providing area control service and a unit providing approach control service, at a point or time agreed between the two (2) units;
- *(c)* between a unit providing approach control service and an aerodrome control tower for—
 - (i) arriving aircraft: responsibility for the control of an arriving aircraft shall be transferred from the unit providing approach control service to the aerodrome control tower, where the aircraft—
 - (A) is in the vicinity of the aerodrome and
 - (I) it is considered that approach and landing will be completed in visual reference to the ground, or
 - (II) has reached uninterrupted visual meteorological conditions, or
 - (B) is at a prescribed point or level, as specified in letters of agreement or ATS unit instructions, or
 - (C) has landed; and
 - (ii) departing aircraft: responsibility for control of a departing aircraft shall be transferred from the aerodrome control tower to the unit providing approach control service —

- (A) when visual meteorological conditions prevail in the vicinity of the aerodrome—
 - (I) prior to the time the aircraft leaves the vicinity of the aerodrome;
 - (II) prior to the aircraft entering instrument meteorological conditions; or
 - (III) at a prescribed point or level, as specified in letters of agreement or ATS unit instructions; and
- (B) when instrument meteorological conditions prevail at the aerodrome
 - (I) immediately after the aircraft is airborne; or
 - (II) at a prescribed point or level, as specified in letters of agreement or ATS unit instructions; and
- (d) between control sectors or positions within the same air traffic control unit: responsibility for control of an aircraft shall be transferred from one (1) control sector or position to another control sector or position within the same air traffic control unit at a point, level or time, as specified in ATS unit instructions.

Coordination of Transfer of Responsibility for Control

6. Responsibility for control of an aircraft, shall not be transferred from one ATC unit to another without the consent of the ATC unit that is accepting control, in accordance with the following:

- (a) the air traffic control unit that is transferring control shall communicate to the ATC unit that is accepting control, the appropriate parts of the current flight plan and any control information pertinent to the transfer requested;
- (b) where transfer of control is to be effected using radar or ADS-B data, the control information pertinent to the transfer shall include information on the position and if required, the track and speed of the aircraft, as observed by radar or ADS- immediately prior to the transfer;
- (c) where transfer of control is to be effected using ADS-C data, the control information pertinent to the transfer shall include the four-dimensional position and other information as necessary;
- (*d*) the ATC unit accepting control shall
 - (i) indicate its ability to accept control of the aircraft on the terms specified by the ATC unit that is transferring control, unless by prior agreement between the ATC units concerned, the absence of any such indication is understood to signify acceptance of the terms specified, or indicate any necessary changes thereto; and
 - specify any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer; and
 - (iii) notify the transferring air traffic control unit when it has established two-way voice and data link communications with and assumed control of the aircraft concerned, unless otherwise specified by agreement between the two (2) control units concerned; and
- *(e)* applicable coordination procedures, including transfer of control points, shall be specified in letters of agreement and air traffic control unit instructions as appropriate.

Air Traffic Control Clearances

7. Air traffic control clearances shall be based solely on the requirements for providing ATC services as follows:

- (a) contents of an ATC clearance shall indicate the following:
 - (i) aircraft identification as shown in the flight plan;
 - (ii) clearance limit;
 - (iii) route of flight;
 - (iv) levels of flight for the entire route or part thereof and changes of levels if required; and
 - (v) any necessary instructions or information on other matters such as approach or departure manoeuvres, communications and the time clearance expires.
- (*b*) Standard departure and arrival routes and associated procedures shall be established when necessary to facilitate:
 - i) the safe, orderly and expeditious flow of air traffic;
 - ii) the description of the route and procedure in air traffic control clearances.
- (c) the ATC clearance relating to the transonic acceleration phase of a supersonic flight shall extend at least to the end of that phase;
- (*d*) The air traffic control clearance relating to the deceleration and descent of an aircraft from supersonic cruise to subsonic flight shall provide for uninterrupted descent, at least during the transonic phase.
- (e) the flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions that were transmitted by voice;
- (*f*) notwithstanding paragraph (*c*) the following items shall always be read back by flight crew;
 - (i) ATC route clearances;
 - (ii) clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway; and

- (iii) runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in ATIS broadcasts, transition levels;
- (g) other clearances or instructions, including conditional clearances, shall be read back or acknowledged by the flight crew in a manner to clearly indicate that the clearance or instructions have been understood and will be complied with;
- (h) the air traffic controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back;
- (*i*) unless specified by the Authority, voice read-back of CPDLC messages shall not be required;

Note. The procedures and provisions relating to the exchange and acknowledgement of CPDLC messages are contained in Annex 10, Volume II of the Chicago Convention, and PANS-ATM, Chapter 14.

- (*j*) an air traffic control clearance shall be coordinated between air traffic control units to cover the entire route of an aircraft or a specified portion thereof as follows—
 - (i) an aircraft shall be cleared for the entire route to the aerodrome of first intended landing when:
 - (A) it has been possible, prior to departure, to coordinate the clearance between all the units under whose control the aircraft will come; or
 - (B) there is reasonable assurance that prior coordination will be effected between those units under whose control the aircraft will subsequently come;
 - (ii) coordination as prescribed in paragraph (i) has not been achieved or is not anticipated, the aircraft shall be cleared only to that point when coordination is reasonably assured; prior to reaching such point, or at such point, the aircraft shall receive further clearance with holding instructions being issued as appropriate;

- (iii) where prescribed by the appropriate ATS authority, aircraft shall contact a downstream air traffic control unit, for the purpose of receiving a downstream clearance prior to the transfer of control point;
- (iv) aircraft shall maintain the necessary two-way communication with the current air traffic control unit while obtaining a downstream clearance;
- (v) a clearance issued as a downstream clearance shall be clearly identifiable as such to the pilot;
- (vi) unless coordinated, downstream clearances shall not affect the aircraft's original flight profile in any airspace, other than that of the air traffic control unit responsible for the delivery of the downstream clearance;

Note: Requirements relating to the application of downstream clearance, delivery service are specified in Volume 2 of Annex 10 of the Chicago Convention. Guidance material is contained in the manual of air traffic services data link applications (ICAO Doc. 9694)

- (vii) Where practicable, and where data link communications are used to facilitate downstream clearance delivery, two-way voice communications between the pilot and the air traffic control unit providing the downstream clearance shall be available.
- (viii) when an aircraft intends to depart from an aerodrome within a control area to enter another control area within a period of thirty (30) minutes, or such other specific period of time as has been agreed between the area control centres concerned, coordination with the subsequent area control centre shall be effected prior to issuance of the departure clearance;
- (ix) when an aircraft intends to leave a control area for flight outside controlled airspace, and will subsequently re-enter the same or another control area, a clearance from point of departure to the

aerodrome of first intended landing may be issued; and

- (x) the clearance or revisions specified in paragraph 7(*j*)(viii), shall apply only to those portions of the flight conducted within controlled airspace;
- (*k*) ATFM shall be implemented for airspace where air traffic demand at times exceeds, or is expected to exceed, the declared capacity of the air traffic control services concerned;
- (l) ATFM shall be implemented on the basis of regional air navigation agreements or, if appropriate, through multilateral agreements. Such agreements shall make provision for common procedures and common methods of capacity determination.
- (*m*) when it becomes apparent to an air traffic control unit that traffic additional to that already accepted cannot be accommodated within a given period of time at a particular location or in a particular area, or can only be accommodated at a given rate, that air traffic control unit shall so advise the ATFM unit, when such is established, as well as, when appropriate, air traffic services units concerned; and
- (*n*) flight crews of aircraft destined to the location or area in question and operators concerned shall also be advised of the delays expected or the restrictions that will be applied.

Control of Persons and Vehicles at Aerodromes

8. (1) The movement of persons or vehicles including towed aircraft on the manoeuvring area of an aerodrome shall, where necessary, be controlled by the aerodrome control tower to avoid hazard to other persons, vehicles or to aircraft landing, taxiing or taking off.

(2) In conditions where low visibility procedures are in operation -

- (a) persons and vehicles operating on the manoeuvring area of an aerodrome shall be restricted to the essential minimum, and in particular, regard shall be given to the requirements to protect the ILS sensitive areas when Category II or Category III precision instrument operations are in progress; and
- (*b*) subject to paragraph 8(3), the minimum separation between vehicles and taxiing aircraft shall be as prescribed by the Authority taking into account the landing aids available.

(3) Emergency vehicles proceeding to the assistance of an aircraft in distress shall be given priority over all other surface movement traffic.

(4) Subject to sub-clause (3), vehicles on the manoeuvring area shall be required to comply with the following:

- (*a*) vehicles and vehicles towing aircraft shall give way to aircraft which are landing, taking off or taxiing;
- (b) vehicles shall give way to other vehicles towing aircraft; and
- (*c*) vehicles shall give way to other vehicles in accordance with ATS unit instructions.

(5) Notwithstanding sub-clause (4), vehicles and vehicles towing aircraft shall comply with instructions issued by the aerodrome control tower.

Provision of Radar and ADS-B

9. Radar and ADS-B ground systems shall provide for the display of safety related alerts and warnings, including conflict alert, conflict prediction, minimum safe altitude warning and unintentionally duplicated SSR codes.

ATS Surveillance Services

Note. — ADS-contract (ADS-C), at this time used wholly to provide procedural separation, is covered in Chapter 13 of Doc. 4444.

10. (1) ATS Surveillance Systems Capabilities -

(a) ATS surveillance systems used in the provision of air traffic services shall have a very high level of reliability, availability and integrity. The possibility of system failures or significant system degradations which may cause complete or partial interruptions of service shall be very remote. Back-up facilities shall be provided.

Note 1. — An ATS surveillance system will normally consist of a number of integrated elements, including sensor(s), data transmission links, data-processing systems and situation displays.

Note 2. — Guidance material pertaining to use of radar and to system performance is contained in the Manual on Testing of Radio Navigation Aids (Doc 8071), the Manual on the Secondary

Surveillance Radar (SSR) Systems (Doc 9684) and the Air Traffic Services Planning Manual (Doc 9426).

Note 3. — Guidance material pertaining to use of ADS-B and MLAT systems and their system performance is contained in Cir 326.

Note 4. — Functional and performance requirements pertaining to ATS surveillance systems are contained in Annex 10 — Aeronautical Telecommunications, Volume IV — Surveillance and Collision Avoidance Systems.

- (*b*) ATS surveillance systems shall have the capability to receive, process and display, in an integrated manner, data from all the connected sources.
- (c) ATS surveillance systems shall be capable of integration with other automated systems used in the provision of ATS, and shall provide for an appropriate level of automation with the objectives of improving the accuracy and timeliness of data displayed to the controller and reducing controller workload and the need for verbal coordination between adjacent control positions and ATC units.
- (*d*) ATS surveillance systems shall provide for the display of safety-related alerts and warnings, including conflict alert, minimum safe altitude warning, conflict prediction and unintentionally duplicated SSR codes and aircraft identification.
- (*e*) The ANSP shall, to the extent possible, facilitate the sharing of information derived from ATS surveillance systems in order to extend and improve surveillance coverage in adjacent control areas.
- (*f*) The ANSP shall, to the extent possible, provide for the automated exchange of coordination data relevant to aircraft being provided with ATS surveillance services, and establish automated coordination procedures.
- (g) ATS surveillance systems, such as primary surveillance radar (PSR), secondary surveillance radar (SSR), ADS-B and MLAT systems may be used either alone or in combination in the provision of *air traffic services, including in the provision of separation between aircraft, provided:*

- i. reliable coverage exists in the area; and
- ii. the probability of detection, the accuracy and the integrity of the ATS surveillance system(s) are satisfactory; and
- iii. in the case of ADS-B, the availability of data from participating aircraft is adequate.
- (*h*) PSR systems shall be used in circumstances where other surveillance systems alone would not meet the air traffic services requirements.
- (i) SSR systems, especially those utilising monopulse techniques or having Mode S capability, or MLAT may be used alone, including in the provision of separation between aircraft, provided:
 - i. the carriage of SSR transponders is mandatory within the area; and
 - ii. identification is established and maintained.
- (*j*) ADS-B shall only be used for the provision of air traffic control service provided the quality of the information contained in the ADS-B message exceeds the values specified by the ANSP.
- (*k*) ADS-B may be used alone, including in the provision of separation between aircraft, provided:
 - i. identification of ADS-B-equipped aircraft is established and maintained;
 - ii. the data integrity measure in the ADS-B message is adequate to support the separation minimum;
 - iii. there is no requirement for detection of aircraft not transmitting ADS-B; and
 - iv. there is no requirement for determination of aircraft position independent of the positiondetermining elements of the aircraft navigation system.

(l) The provision of ATS surveillance services shall be limited to specified areas of coverage and shall be subject to such other limitations as have been specified by the ANSP. Adequate information on the operating methods used shall be *published in aeronautical information publications, as well as operating practices and/or equipment limitations having direct effects on the operation of the air traffic services.*

Note.— The ANSP will provide information on the area or areas where PSR, SSR, ADS-B and MLAT systems are in use as well as ATS surveillance services and procedures in accordance with ICAO Annex 15, 4.1.1 and Appendix 1.

- i. The provision of ATS surveillance services shall be limited when position data quality degrades below a level specified by the ANSP.
- (m) Where PSR and SSR are required to be used in combination, SSR alone may be used in the event of PSR failure to provide separation between identified transponder-equipped aircraft, provided the accuracy of the SSR position indications has been verified by monitor equipment or other means.

(2) Situation Display –

- (a) A situation display providing surveillance information to the controller shall, as a minimum, include position indications, map information required to provide ATS surveillance services and, where available, information concerning the identity of the aircraft and the aircraft level.
- (*b*) The ATS surveillance system shall provide for a continuously updated presentation of surveillance information, including positionindications.
- (c) Position indications may be displayed as:
 - i. individual position symbols, e.g. PSR, SSR, ADS-B or MLAT symbols, or combined symbols;
 - ii. PSR blips; and
 - iii. SSR responses.
- (*d*) When applicable, distinct symbols shall be used for presentation of:
- unintentionally duplicated SSR codes and/or aircraft identification that are unintentionally duplicated;
- ii. predicted positions for a non-updated track; and
- iii. plot and track data.
- (e) Where surveillance data quality degrades such that services need to be limited, symbology or other means shall be used to provide the controller with an indication of the condition.
- (f) Reserved SSR codes, including 7500, 7600 and 7700, operation of IDENT, ADS-B emergency and/or urgency modes, safetyrelated alerts and warnings as well as information related to automated coordination shall be presented in a clear and distinct manner, providing for ease of recognition.
- (g) Labels associated with displayed targets shall be used to provide, in alphanumeric form, relevant information derived from the means of surveillance and, where necessary, the flight data processing system.
- (h) Labels shall, as a minimum, include information relating to the identity of the aircraft, e.g. SSR code or aircraft identification and, if available, pressure-altitude- derived level information. This information may be obtained from SSR Mode A, SSR Mode C, SSR Mode S and/or ADS-B.
- (i) Labels shall be associated with their position indications in a manner precluding erroneous identification by or confusion on the part of the controller. All label information shall be presented in a clear and concise manner.

(3) Communications -

(a) The level of reliability and availability of communications systems shall be such that the possibility of system failures or significant degradations is very remote. Adequate backup facilities shall be provided.

Note. — Guidance material and information pertaining to system reliability and availability are contained in ICAO Annex 10, Volume I and the Air Traffic Services Planning Manual (Doc 9426).

- (*b*) Direct pilot-controller communications shall be established prior to the provision of ATS surveillance services, unless special circumstances such as emergencies dictate otherwise.
- (4) Provision of ATS Surveillance Services -
 - (*a*) Information derived from ATS surveillance systems, including safety-related alerts and warnings such as conflict alert and minimum safe altitude warning, shall be used to the extent possible in the provision of air traffic control service in order to improve capacity and efficiency as well as to enhance safety.
 - (*b*) The number of aircraft simultaneously provided with ATS surveillance services shall not exceed that which can safely be handled under the prevailing circumstances, taking into account:
 - i. the structural complexity of the control area or sector concerned;
 - ii. the functions to be performed within the control area or sector concerned;
 - assessments of controller workloads, taking into account different aircraft capabilities, and sector capacity; and
 - iv. the degree of technical reliability and availability of the primary and backup communications, navigation and surveillance systems, both in the aircraft and on the ground.
- (5) Use of SSR Transponders and ADS-B Transmitters -
 - (a) General
 - i. To ensure the safe and efficient use of ATS surveillance services, pilots and controllers shall strictly adhere to published operating procedures and standard radiotelephony phraseology shall be used. The correct setting of transponder codes and/or aircraft identification shall be ensured at all times.
 - (b) SSR Code management

- i. Codes 7700, 7600 and 7500 shall be reserved internationally for use by pilots encountering a state of emergency, Radio-communication failure or unlawful interference, respectively.
- ii. SSR Codes are to be allocated and assigned in accordance with the following principles.
- iii. Codes shall be allocated to States or areas in accordance with regional air navigation agreements, taking into account overlapping radar coverage over adjacent airspaces.
- iv. The ANSP shall establish a plan and procedures for the allocation of codes to ATS units.
- v. The plan and procedures shall be compatible with those practised in adjacent States.
- vi. The allocation of a code shall preclude the use of this code for any other function within the area of coverage of the same SSR for a prescribed time period.
- vii. To reduce pilot and controller workload and the need for controller/pilot communications, the number of code changes required of the pilot shall be kept to the minimum.
- viii. Codes shall be assigned to aircraft in accordance with the plan and procedures laid down by the ANSP.
- ix. Where there is a need for individual aircraft identification, each aircraft shall be assigned a discrete code which shall, whenever possible, be retained throughout the flight.
- x. Except for aircraft in a state of emergency, or during communication failure or unlawful interference situations, and unless otherwise agreed between a transferring and an accepting ATC unit, the transferring unit shall assign Code A2000 to a controlled flight prior to transfer of communications.

xi. SSR Codes shall be reserved, as necessary, for exclusive use by medical aircraft operating in areas of international armed conflict. Such SSR Codes shall be allocated by ICAO through its Regional Offices.

Note. — The term "medical aircraft" refers to aircraft protected under the Geneva Conventions of 1949 and under the Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I).

(c) Operation of SSR transponders

Note. — SSR transponder operating procedures are contained in Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume I, Part VIII, Section 3.

- i. When it is observed that the Mode A code shown on the situation display is different to what has been assigned to the aircraft, the pilot shall be requested to confirm the code selected and, if the situation warrants (e.g. not being a case of unlawful interference), to reselect the correct code.
- ii. If the discrepancy between assigned and displayed Mode A codes still persists, the pilot may be requested to stop the operation of the aircraft's transponder. The next control position and any other affected unit using SSR and/or MLAT in the provision of ATS shall be informed accordingly.
- iii. Aircraft equipped with Mode S having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration.

Note. — All Mode S-equipped aircraft engaged in international civil aviation are required to have an aircraft identification feature (ICAO Annex 10, Volume IV, Chapter 2, 2.1.5.2, refers).

- iv. Whenever it is observed on the situation display that the aircraft identification transmitted by a Mode S-equipped aircraft is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re-enter the correct aircraft identification.
- v. If, following confirmation by the pilot that the correct aircraft identification has been set on the Mode S identification feature, the discrepancy continues to exist, the following actions shall be taken by the controller:
 - (A) inform the pilot of the persistent discrepancy;
 - (B) where possible, correct the label showing the aircraft identification on the situation display; and
 - (C) notify the erroneous aircraft identification transmitted by the aircraft to the next control position and any other interested unit using Mode S for identification purposes.

(*d*) Operation of ADS-B Transmitters

Note 1. — To indicate that it is in a state of emergency or to transmit other urgent information, an aircraft equipped with ADS-B might operate the emergency and/or urgency mode as follows:

- emergency;
- *communication failure;*
- unlawful interference;
- *minimum fuel; and/or*
- medical.

Note 2. — Some aircraft equipped with first generation ADS-B avionics do not have the capability described in Note 1 above and only have the capability to transmit a general emergency alert regardless of the code selected by the pilot.

i. Aircraft equipped with ADS-B having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration.

- ii. Whenever it is observed on the situation display that the aircraft identification transmitted by an ADS-B-equipped aircraft is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re-enter the correct aircraft identification.
- iii. If, following confirmation by the pilot that the correct aircraft identification has been set on the ADS-B identification feature, the discrepancy continues to exist, the following actions shall be taken by the controller:
 - (A) inform the pilot of the persistent discrepancy;
 - (B) where possible, correct the label showing the aircraft identification on the situation display; and
 - (C) notify the next control position and any other unit concerned of the erroneous aircraft identification transmitted by the aircraft.
- *(e)* Level information based on the use of pressure-altitude information.
 - I. Verification of Level Information
 - 1. Verification of pressure-altitude-derived level information displayed to the controller shall be effected at least once by each suitably equipped ATC unit on initial contact with the aircraft concerned or, if this is not feasible, as soon as possible thereafter. The verification shall effected by simultaneous be comparison with altimeter-derived level information received from the same aircraft by radiotelephony. The pilot of the aircraft whose pressure-altitude-derived level information is within the approved tolerance value need not be advised of such verification. Geometric height information

shall not be used to determine if altitude differences exist.

- 2. If the displayed level information is not within the approved tolerance value or when a discrepancy in excess of the approved tolerance value is detected subsequent to verification, the pilot shall be advised accordingly and requested to check the pressure setting and confirm the aircraft's level.
- 3. If, following confirmation of the correct pressure setting the discrepancy continues to exist, the following action shall be taken according to circumstances:
 - i. request the pilot to stop Mode C or ADS-B altitude data transmission, provided this does not cause the loss of position and identity information, and notify the next control positions or ATC unit concerned with the aircraft of the action taken; or
 - ii. inform the pilot of the discrepancy and request that the relevant operation continue in order to prevent loss of position and identity information of the aircraft and, when authorised by the ANSP, override the label-displayed level information with the reported level. Notify the next control position or ATC unit concerned with the aircraft of the action taken.

II. Determination of Level Occupancy

 The criterion which shall be used to determine that a specific level is occupied by an aircraft shall be ±60 m (±200 ft) in RVSM airspace. In other airspace, it shall be ±90m (±300 ft), except that the ANSP may specify a smaller criterion, but not less than ±60m (±200 ft), if this is found to be more practical. Note. — For a brief explanation of the considerations underlying this value, see the Air Traffic Services Planning Manual (Doc 9426).

- 2. Aircraft maintaining a level. An aircraft is considered to be maintaining its assigned level as long as the pressure-altitude-derived level information indicates that it is within the appropriate tolerances of the assigned level, as specified in 1 above.
- 3. Aircraft vacating a level. An aircraft cleared to leave a level is considered to have commenced its manoeuvre and vacated the previously occupied level when the pressure-altitude-derived level information indicates a change of more than 90 m (300 ft) in the anticipated direction from its previously assigned level.
- 4. Aircraft passing a level in climb or descent. An aircraft in climb or descent is considered to have crossed a level when the pressurealtitude-derived level information indicates that it has passed this level in the required direction by more than 90 m (300 ft).
- 5. Aircraft reaching a level. An aircraft is considered to have reached the level to which it has been cleared when the elapsed time of three display updates, three sensor updates or 15 seconds, whichever is the greater, has passed since the pressure-altitude-derived level information has indicated that it is within the appropriate tolerances of the assigned level, as specified in 1 above.
- 6. Intervention by a controller shall only be required if differences in level information between that displayed to the controller and that used for control purposes are in excess of the values stated above.

(6) General Procedures -

I. Performance Checks

- (a) The controller shall adjust the situation display(s) and carry out adequate checks on the accuracy thereof, in accordance with the technical instructions prescribed by the appropriate authority for the radar equipment concerned.
- (b) The controller shall be satisfied that the available functional capabilities of the ATS surveillance system as well as the information presented on the situation display(s) is adequate for the functions to be performed.
- (c) The controller shall report, in accordance with local procedures, any fault in the equipment, or any incident requiring investigation, or any circumstances which make it difficult or impractical to provide ATS surveillance services.
- II. Identification of Aircraft
 - (a) Establishment of Identification
 - i. Before providing ATS surveillance service to an aircraft, identification shall be established and the pilot informed. Thereafter, identification shall be maintained until termination of the ATS surveillance service.
 - ii. If identification is subsequently lost, the pilot shall be informed accordingly and, when applicable, appropriate instructions issued.
 - iii. Identification shall be established by at least one of the methods specified in (*b*), (*c*), (*d*) and (*e*).
 - (b) ADS-B Identification Procedures
 - i. Where ADS-B is used for identification, aircraft may be identified by one or more of the following procedures:

- 1. direct recognition of the aircraft identification in an ADS-B label;
- 2. transfer of ADS-B identification (see *III below*); and
- 3. observation of compliance with an instruction to TRANSMIT ADS-B IDENT.

Note 1. — Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

Note 2. — In automated systems, the "IDENT" feature may be presented in different ways, e.g. as a flashing of all or part of the position indication and associated label.

- (c) SSR and/or MLAT Identification Procedures
 - i. Where SSR and/or MLAT is used for identification, aircraft may be identified by one or more of the following procedures:
 - 1. recognition of the aircraft identification in a SSR and/or MLAT label;

Note. — The use of this procedure requires that the code/call sign correlation is achieved successfully, taking into account the Note following b) below.

2. recognition of an assigned discrete code, the setting of which has been verified, in a SSR and/or MLAT label; and

Note. — The use of this procedure requires a system of code assignment which ensures that each aircraft in a given portion of airspace is assigned a discrete code (see (5) (b) ix). 3. direct recognition of the aircraft identification of a Mode S-equipped aircraft in a SSR and/or MLAT label;

Note. — The aircraft identification feature available in Mode S transponders provides the means to identify directly individual aircraft on radar displays and thus offers the potential to eliminate ultimately the recourse to Mode A discrete codes for individual identification. This elimination will only be achieved in a progressive manner depending on the state of deployment of ground airborne suitable and installations.

- by transfer of radar identification (see *III*);
- 5. observation of compliance with an instruction to set a specific code;
- observation of compliance with an instruction to squawk IDENT;

Note 1. — In automated radar systems, the "IDENT" feature may be presented in different ways, e.g. as a flashing of all or part of the radar position and associated data block.

Note 2. — Garbling of transponder replies may produce "IDENT"-type indications. Nearly simultaneous "IDENT" transmissions within the same area may give rise to errors in identification.

ii. When a discrete code has been assigned to an aircraft, a check shall be made at the earliest opportunity to ensure that the code set by the pilot is identical to that assigned for the flight. Only after this check has been made shall the discrete code be used as a basis for identification.

- (d) PSR Identification Procedures
 - i. Where PSR is used for identification, aircraft may be identified by one or more of the following procedures:
 - 1. by correlating a particular radar position indication with an aircraft reporting its position over, or as bearing and distance from, a point displayed on the radar map, and by ascertaining that the track of the particular radar position is consistent with the aircraft path or reported heading;

Note 1. — Caution must be exercised when employing this method since a position reported in relation to a point may not coincide precisely with the radar position indication of the aircraft on the radar map.

The ANSP may, therefore, prescribe additional conditions for the application of this method, e.g.:

- A. a level or levels above which this method may not be applied in respect of specified navigation aids; or
- B. a distance from the radar site beyond which this method may not be applied.

Note 2. — The term "a point" refers to a geographical point suitable for the purposes of radar identification. It is normally a reporting point defined by reference to a radio navigation aid or aids.

2. by correlating an observed radar position indication with an aircraft which is known to have just departed, provided that the identification is established within 2 km (1 NM) from the end of the runway used. Particular care shall be taken to avoid confusion with aircraft holding over or overflying the aerodrome, or with aircraft departing from or making a missed approach over adjacent runways;

- by transfer of identification (see *III below*);
- 4. by ascertaining the aircraft heading, if circumstances require, and following a period of track observation:
 - A. instructing the pilot to execute one or more changes of heading of 30 degrees or more and correlating the movements of one particular radar position indication with the aircraft's acknowledged execution of the instructions given; or
 - B. correlating the movements of a particular radar position indication with manoeuvres currently executed by an aircraft having so reported.

When using these methods, the controller shall:

- C. verify that the movements of not more than one radar position indication correspond with those of the aircraft; and
- D. ensure that the manoeuvre(s) will not carry the aircraft outside the

coverage of the radar or situation display.

Note 1. — Caution must be exercised when employing these methods in areas where route changes normally take place.

Note 2. — With reference to B above, see also V. (a) regarding vectoring of controlled aircraft.

(e) Additional Identification Method

When two (2) or more indications are observed in close proximity, or are observed to be making similar movements at the same time, or when doubt exists as to the identity of a position indication for any other reason, changes of heading shall be prescribed or repeated as many times as necessary, or additional methods of identification shall be employed, until all risk of error in identification is eliminated.

III. Transfer of Radar Identification

- (*a*) Transfer of identification from one radar controller to another shall only be attempted when it is considered that the aircraft is within the accepting controller's surveillance coverage.
- (*b*) Transfer of identification shall be effected by one (1) of the following methods:
 - designation of the position indication by automated means, provided that only one (1) position indication is thereby indicated and there is no possible doubt of correct identification;
 - ii. notification of the aircraft's discrete code or aircraft address;

Note 1. — The use of a discrete SSR code requires a system of code assignment which ensures that each aircraft in a given portion of airspace is assigned a discrete code (see (5) (b) ix)). Note 2. — Aircraft address would be expressed in the form of the alphanumerical code of six hexadecimal characters.

- (c) notification that the aircraft is SSR Mode S-equipped with an aircraft identification feature when SSR Mode S coverage is available;
- (d) notification that the aircraft is ADS-B-equipped with an aircraft identification feature when compatible ADS-B coverage is available;
- (e) direct designation (pointing with the finger) of the position indication, if the two situation displays are adjacent, or if a common "conference" type of situation display is used;

Note. — Attention must be given to any errors which might occur due to parallax effects.

(f) designation of the position indication by reference to, or in terms of bearing and distance from, a geographical position or navigational facility accurately indicated on both situation displays, together with the track of the observed position indication if the route of the aircraft is not known to both controllers;

Note. — Caution must be exercised before transferring identification using this method, particularly if other position indications are observed on similar headings and in close proximity to the aircraft under control. Inherent radar deficiencies, such as inaccuracies in bearing and distance of the radar position indications displayed on individual situation displays and parallax errors, may cause the indicated position of an aircraft in relation to the known point to differ between the two situation displays. The ANSP may, therefore, prescribe additional conditions for the application of this method, e.g.:

1. a maximum distance from the common reference point used by the two controllers; and

- 2. a maximum distance between the position indication as observed by the accepting controller and the one stated by the transferring controller.
- (g) where applicable, issuance of an instruction to the aircraft by the transferring controller to change SSR code and the observation of the change by the accepting controller; or
- (*h*) issuance of an instruction to the aircraft by the transferring controller to squawk/transmit IDENT and observation of this response by the accepting controller;

Note. — Use of procedures (g) and (h) requires prior coordination between the controllers, since the indications to be observed by the accepting controller are of short duration.

- IV. Position Information
 - (*a*) An aircraft provided with ATS surveillance service shall be informed of its position in the following circumstances:
 - i. upon identification, except when the identification is established:
 - A. based on the pilot's report of the aircraft position or within one nautical mile of the runway upon departure and the observed position on the situation display is consistent with the aircraft's time of departure; or
 - B. by use of ADS-B aircraft identification, Mode S aircraft identification or assigned discrete SSR codes and the location of the observed position indication is consistent with the current flight plan of the aircraft; or
 - C. by transfer of identification;

- ii. when the pilot requests this information;
- iii. when a pilot's estimate differs significantly from the controller's estimate based on observed position;
- iv. when the pilot is instructed to resume own navigation after vectoring if the current instructions had diverted the aircraft from a previously assigned route, (see *V*. (*e*));
- v. immediately before termination of ATS surveillance service, if the aircraft is observed to deviate from its intended route.
- (*b*) Position information shall be passed to aircraft in one of the following forms:
 - i. as a well-known geographical position;
 - magnetic track and distance to a significant point, an en-route navigation aid, or an approach aid;
 - iii. direction (using points of the compass) and distance from a known position;
 - iv. distance to touchdown, if the aircraft is on final approach; or
 - v. distance and direction from the centre line of an ATS route.
- (c) Whenever practicable, position information shall relate to positions or routes pertinent to the navigation of the aircraft concerned and shown on the situation display map.
- (d) When so informed, the pilot may omit position reports at compulsory reporting points or report only over those reporting points specified by the air traffic services unit concerned. Unless automated position reporting is in effect (e.g. ADS- C), pilots shall resume voice or CPDLC position reporting:
 - i. when so instructed;

- ii. when advised that the ATS surveillance service has been terminated; or
- iii. when advised that identification is lost.
- V. Vectoring
 - (a) Vectoring shall be achieved by issuing to the pilot specific headings which will enable the aircraft to maintain the desired track. When vectoring an aircraft, a controller shall comply with the following:
 - i. whenever practicable, the aircraft shall be vectored along tracks on which the pilot can monitor the aircraft position with reference to pilot-interpreted navigation aids (this will minimise the amount of navigational assistance required and alleviate the consequences resulting from an ATS surveillance system failure);
 - when an aircraft is given its initial vector diverting it from a previously assigned route, the pilot shall be informed what the vector is to accomplish, and the limit of the vector shall be specified (e.g. to ... position, for ... approach);
 - iii. except when transfer of control is to be effected, aircraft shall not be vectored closer than 4.6 km (2.5 NM) or, where the minimum permissible separation is greater than 9.3 km (5 NM), a distance equivalent to one-half of the prescribed separation minimum, from the limit of the airspace for which the controller is responsible, unless local arrangements have been made to ensure that separation will exist with aircraft operating in adjoining areas;
 - iv. controlled flights shall not be vectored into uncontrolled airspace except in the case of emergency or in order to circumnavigate

adverse meteorological conditions (in which case the pilot shall be so informed), or at the specific request of the pilot; and

- v. when an aircraft has reported unreliable directional instruments, the pilot shall be requested, prior to the issuance of manoeuvring instructions, to make all turns at an agreed rate and to carry out the instructions immediately upon receipt.
- (b) When vectoring an IFR flight and when giving an IFR flight a direct routing which takes the aircraft off an ATS route, the controller shall issue clearances such that the prescribed obstacle clearance will exist at all times until the aircraft reaches the point where the pilot will resume own navigation. When necessary, the relevant minimum vectoring altitude shall include a correction for low temperature effect.

Note 1. — When an IFR flight is being vectored, the pilot may be unable to determine the aircraft's exact position in respect to obstacles in this area and consequently the altitude which provides the required obstacle clearance. Detailed obstacle clearance criteria are contained in PANS-OPS (Doc 8168), Volumes I and II. See also VIII (b).

Note 2. — It is the responsibility of the ANSP to provide the controller with minimum altitudes corrected for temperature effect.

(c) Whenever possible, minimum vectoring altitudes shall be sufficiently high to minimise activation of aircraft ground proximity warning systems.

Note. — Activation of such systems will induce aircraft to pull up immediately and climb steeply to avoid hazardous terrain, possibly compromising separation between aircraft.

(*d*) The ANSP shall encourage operators to report incidents involving activations of aircraft ground proximity warning systems so that their locations can be identified and altitude, routing and/or aircraft operating procedures can be altered to prevent recurrences.

- *(e)* In terminating vectoring of an aircraft, the controller shall instruct the pilot to resume own navigation, giving the pilot the aircraft's position and appropriate instructions, as necessary, in the form prescribed in *IV* (*b*) ii, if the current instructions had diverted the aircraft from a previously assigned route.
- VI. Navigation Assistance
 - (a) An identified aircraft observed to deviate significantly from its intended route or designated holding pattern shall be advised accordingly. Appropriate action shall also be taken if, in the opinion of the controller, such deviation is likely to affect the service being provided.
 - (b) The pilot of an aircraft requesting navigation assistance from an air traffic control unit providing ATS surveillance services shall state the reason (e.g. to avoid areas of adverse weather or unreliable navigational instruments) and shall give as much information as possible in the circumstances.

VII. Interruption or Termination of ATS Surveillance Service

(*a*) An aircraft which has been informed that it is provided with ATS surveillance service shall be informed immediately when, for any reason, the service is interrupted or terminated.

Note. — The transition of an aircraft across adjoining areas of radar and/or ADS-B and/or MLAT systems coverage will not normally constitute an interruption or termination of the ATS surveillance service.

(*b*) When the control of an identified aircraft is to be transferred to a control sector that will provide the aircraft with procedural separation, the transferring controller shall ensure that appropriate procedural separation is established between that aircraft and any other controlled aircraft before the transfer is effected.

VIII. Minimum Levels

- (*a*) The controller shall at all times be in possession of full and up-to-date information regarding:
 - i. established minimum flight altitudes within the area of responsibility;
 - ii. the lowest usable flight level or levels determined; and
 - iii. established minimum altitudes applicable to procedures based on tactical vectoring.
- (b) Unless otherwise specified by the ANSP, minimum altitudes for procedures based on tactical vectoring with any ATS surveillance system shall be determined using the criteria applicable to tactical radar vectoring.

Note. — Criteria for the determination of minimum altitudes applicable to procedures based on tactical radar vectoring are contained in Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume II.

IX. Information Regarding Adverse Weather

(a) Information that an aircraft appears likely to penetrate an area of adverse weather shall be issued in sufficient time to permit the pilot to decide on an appropriate course of action, including that of requesting advice on how best to circumnavigate the adverse weather area, if so desired.

Note. — Depending on the capabilities of the ATS surveillance system, areas of adverse weather may not be presented on the situation display. An aircraft's weather radar will normally provide better detection and definition of adverse weather than radar sensors in use by ATS.

(*b*) In vectoring an aircraft for circumnavigating any area of adverse weather, the radar controller shall ascertain that the aircraft can be returned to its intended or assigned flight path within the coverage of the ATS surveillance system, and, if this does not appear possible, inform the pilot of the circumstances.

Note. — Attention must be given to the fact that under certain circumstances the most active area of adverse weather may not be displayed.

(c) Reporting of significant meteorological information to meteorological offices.

Although a controller is not required to keep a special watch for heavy precipitation, etc., information on the position, intensity, extent and movement of significant meteorological conditions (i.e. heavy showers or welldefined frontal surfaces) as observed on situation displays shall, when practicable, be reported to the associated meteorological office.

(7) Use of ATS Surveillance Systems in the Air Traffic Control Service -

Note. — The procedures in this Section are general procedures applicable when an ATS surveillance system is used in the provision of area control service or approach control service. Additional procedures applicable in the provision of approach control service are detailed in Section 9 below.

I. Functions

The information provided by ATS surveillance systems and presented on a situation display may be used to perform the following functions in the provision of air traffic control service:

- (a) provide ATS surveillance services as necessary in order to improve airspace utilisation, reduce delays, provide for direct routings and more optimum flight profiles, as well as to enhance safety;
- (b) provide vectoring to departing aircraft for the purpose of facilitating an expeditious and efficient departure flow and expediting climb to cruising level;
- *(c)* provide vectoring to aircraft for the purpose of resolving potential conflicts;

- (d) provide vectoring to arriving aircraft for the purpose of establishing an expeditious and efficient approach sequence;
- (e) provide vectoring to assist pilots in their navigation,e.g. to or from a radio navigation aid, away from or around areas of adverse weather;
- (f) provide separation and maintain normal traffic flow when an aircraft experiences communication failure within the area of coverage;
- (g) maintain flight path monitoring of air traffic;

Note. — Where tolerances regarding such matters as adherence to track, speed or time have been prescribed by the ANSP, deviations are not considered significant until such tolerances are exceeded.

- (*h*) when applicable, maintain a watch on the progress of air traffic, in order to provide a procedural controller with:
 - i. improved position information regarding aircraft under control;
 - ii. supplementary information regarding other traffic; and
 - iii. information regarding any significant deviations by aircraft from the terms of their respective air traffic control clearances, including their cleared routes as well as levels, when appropriate.
- II. Separation Application

Note.— Factors which the controller using an ATS surveillance system must take into account in determining the spacing to be applied in particular circumstances in order to ensure that the separation minimum is not infringed include aircraft relative headings and speeds, ATS surveillance system technical limitations, controller workload and any difficulties caused by communication congestion. Guidance material on this subject is contained in the Air Traffic Services Planning Manual (Doc 9426).

- (*a*) Except as provided for in *II* (*h*), *II* (*i*) and *II* (*b*), the separation minima specified in *III* shall only be applied between identified aircraft when there is reasonable assurance that identification will be maintained.
- (b) When control of an identified aircraft is to be transferred to a control sector that will provide the aircraft with procedural separation, such separation shall be established by the transferring controller before the aircraft reaches the limits of the transferring controller's area of responsibility, or before the aircraft leaves the relevant area of surveillance coverage.
- (c) When authorised by the ANSP, separation based on the use of ADS-B, SSR and/or MLAT, and/or PSR position symbols and/or PSR blips shall be applied so that the distance between the centres of the position symbols and/or PSR blips, representing the positions of the aircraft concerned, is never less than a prescribed minimum.
- (*d*) Separation based on the use of PSR blips and SSR responses shall be applied so that the distance between the centre of the PSR blip and the nearest edge of the SSR response (or centre, when authorised by the ANSP) is never less than a prescribed minimum.
- (e) Separation based on the use of ADS-B position symbols and SSR responses shall be applied so that the distance between the centre of the ADS-B position symbol and the nearest edge of the SSR response (or the centre, when authorised by the ANSP) is never less than a prescribed minimum.
- (f) Separation based on the use of SSR responses shall be applied so that the distance between the closest edges of the SSR responses (of the centres, when authorised by the ANSP) is never less than a prescribed minimum.
- (g) In no circumstances shall the edges of the position indications touch or overlap unless vertical separation is applied between the aircraft concerned,

irrespective of the type of position indication displayed and separation minimum applied.

- (h) In the event that the controller has been notified of a controlled flight entering or about to enter the airspace within which the separation minima specified in *III* is applied, but has not identified the aircraft, the controller may, if so prescribed by the ANSP, continue to provide an ATS surveillance service to identified aircraft provided that:
 - i. reasonable assurance exists that the unidentified controlled flight will be identified using SSR and/or ADS-B and/or MLAT or the flight is being operated by an aircraft of a type which may be expected to give an adequate return on primary radar in the airspace within which the separation is applied; and
 - ii. the separation is maintained between identified flights and any other observed ATS surveillance system position indications until either the unidentified controlled flight has been identified or procedural separation has been established.
- (*i*) The separation minima specified in *III* may be applied between an aircraft taking off and a preceding departing aircraft or other identified traffic provided there is reasonable assurance that the departing aircraft will be identified within 2 km (1 NM) from the end of the runway, and that, at the time, the required separation will exist.
- (j) The separation minima specified in *III* shall not be applied between aircraft holding over the same holding fix. Application of ATS surveillance system separation minima based on radar and/or ADS-B and/or MLAT system between holding aircraft and other flights shall be subject to requirements and procedures prescribed by the ANSP.
- III. Separation Minima Based on ATS Surveillance Systems

- (a) Unless otherwise prescribed in accordance with (b), (c) or (d), (with respect to independent and dependent parallel approaches), the horizontal separation minimum based on radar and/or ADS-B and/or MLAT systems shall be 9.3 km (5.0 NM).
- (*b*) The separation minimum in (*a*) may, if so prescribed by the appropriate the ANSP, be reduced, but not below:
 - i. 5.6 km (3.0 NM) when radar and/or ADS-B and/or MLAT systems' capabilities at a given location so permit; and
 - 4.6 km (2.5 NM) between succeeding aircraft which are established on the same final approach track within 18.5 km (10 NM) of the runway threshold. A reduced separation minimum of 4.6 km (2.5 NM) may be applied, provided:
 - A. the average runway occupancy time of landing aircraft is proven, by means such as data collection and statistical analysis and methods based on a theoretical model, not to exceed fifty (50) seconds;
 - B. braking action is reported as good and runway occupancy times are not adversely affected;
 - C. an ATS surveillance system with appropriate azimuth and range resolution and an update rate of five (5) seconds or less is used in combination with suitable displays;
 - D. the aerodrome controller is able to observe, visually or by means of surface movement radar (SMR), MLAT system or a surface movement guidance and control system (SMGCS), the runway-in-use and associated exit and entry taxiways;

- E. distance-based wake turbulence separation minima in (*d*), or as may be prescribed by the ANSP (e.g. for specific aircraft types), do not apply;
- F. aircraft approach speeds are closely monitored by the controller and when necessary adjusted so as to ensure that separation is not reduced below the minimum;
- G. aircraft operators and pilots have been made fully aware of the need to exit the runway in an expeditious manner whenever the reduced separation minimum on final approach is applied; and
- H. procedures concerning the application of the reduced minimum are published in AIPs.
- (c) The separation minimum or minima based on radar and/or ADS-B and/or MLAT systems to be applied shall be prescribed by the ANSP according to the capability of the particular ATS surveillance system or sensor to accurately identify the aircraft position in relation to the centre of a position symbol, PSR blip, SSR response and taking into account factors which may affect the accuracy of the ATS surveillance system-derived information, such as aircraft range from the radar site and the range scale of the situation display in use.
- (*d*) The following distance-based wake turbulence separation minima shall be applied to aircraft being provided with an ATS surveillance service (radar) in the approach and departure phases of flight in the circumstances given in i.

| Aircraft Category | | |
|--------------------|---------------------|---|
| Preceding aircraft | Succeeding aircraft | Wake turbulence radar separation minima |
| A380-800 | A380-800 | Not required* |

| A380-800 | non-A380-800 HEAVY | 6.0 NM |
|--------------------|--------------------|--------|
| non-A380-800 HEAVY | non-A380-800 HEAVY | 4.0 NM |
| | | |
| A380-800 | MEDIUM | 7.0 NM |
| non-A380-800 HEAVY | MEDIUM | 5.0 NM |
| | | |
| A380-800 | LIGHT | 8.0 NM |
| non-A380-800 HEAVY | LIGHT | 6.0 NM |
| | | |
| MEDIUM | LIGHT | 5.0 NM |

* When a wake turbulence restriction is not required, then the separation reverts to radar separation minimum as prescribed by the ANSP. The recommendation of the adhoc group (safety case) indicated that no wake constraint exists for the A380-800 either following another A380-800 or a non-A380-800 HEAVY aircraft.

- i. The minima set out in (*d*) shall be applied when:
 - A. an aircraft is operating directly behind another aircraft at the same altitude or less than 1 000 ft below; or
 - B. both aircraft are using the same runway, or parallel runways separated by less than 2 500 ft; or
 - C. an aircraft is crossing behind another aircraft, at the same altitude or less than 1 000 ft below.

IV. Transfer of Control

- (*a*) Where an ATS surveillance service is being provided, transfer of control shall be effected, whenever practicable, so as to enable the uninterrupted provision of the ATS surveillance service.
- (b) Where SSR and/or ADS-B and/or MLAT is used and the display of position indications with associated labels is provided for, transfer of control of aircraft between adjacent control positions or between adjacent ATC units may be effected without prior coordination, provided that:

- updated flight plan information on the aircraft about to be transferred, including the discrete assigned SSR code or, with respect to Mode S and ADS-B, the aircraft identification, is provided to the accepting controller prior to transfer;
- ii. the ATS surveillance system coverage provided to the accepting controller is such that the aircraft concerned is presented on the situation display before the transfer is effected and is identified on, but preferably before, receipt of the initial call;
- iii. when the controllers are not physically adjacent, two-way direct speech facilities, which permit communications to be established instantaneously, are available between them at all times;

Note. — "Instantaneous" refers to communications which effectively provide for immediate access between controllers.

- iv. the transfer point or points and all other conditions of application, such as direction of specified flight, levels, transfer of communication points, and especially an agreed minimum separation between aircraft, including that applicable to succeeding aircraft on the same route, about to be transferred as observed on the situation display, have been made the subject of specific instructions (for intra-unit transfer) or of a specific letter of agreement between two (2) adjacent ATC units;
- v. the instructions or letter of agreement specify explicitly that the application of this type of transfer of control may be terminated at any time by the accepting controller, normally with an agreed advance notice;
- vi. the accepting controller is informed of any level, speed or vectoring instructions given to the aircraft prior to its transfer and which

modify its anticipated flight progress at the point of transfer.

Note. — "Instantaneous" refers to communications which effectively provide for immediate access between controllers.

- (c) The minimum agreed separation between aircraft about to be transferred (*IV* (*b*) iv.) refers) and the advance notice (*IV* (*b*) v.) refers) shall be determined taking into account all relevant technical, operational and other circumstances. If circumstances arise in which these agreed conditions can no longer be satisfied, controllers shall revert to the procedure in (*d*) until the situation is resolved.
- (d) Where primary radar is being used, and where another type of ATS surveillance system is employed but the provisions of (b) are not applied, the transfer of control of aircraft between adjacent control positions or between two adjacent ATS units may be effected, provided that:
 - i. identification has been transferred to or has been established directly by the accepting controller;
 - when the controllers are not physically adjacent, two-way direct-speech facilities between them are at all times available which permit communications to be established instantaneously;
 - iii. separation from other controlled flights conforms to the minima authorised for use during transfer of control between the sectors or units concerned;
 - iv. the accepting controller is informed of any level, speed or vectoring instructions applicable to the aircraft at the point of transfer;
 - v. radio-communication with the aircraft is retained by the transferring controller until the accepting controller has agreed to assume responsibility for providing the ATS

surveillance service to the aircraft. Thereafter, the aircraft shall be instructed to change over to the appropriate channel and from that point is the responsibility of the accepting controller.

V. Speed Control

Subject to conditions specified by the ANSP, including consideration of aircraft performance limitations, a controller may, in order to facilitate sequencing or to reduce the need for vectoring, request aircraft to adjust their speed in a specified manner.

- (8) Emergencies, Hazards and Equipment Failures -
 - I. Emergencies
 - (a) In the event of an aircraft in, or appearing to be in, any form of emergency, every assistance shall be provided by the controller, and the procedures prescribed herein may be varied according to the situation.
 - (b) The progress of an aircraft in emergency shall be monitored and (whenever possible) plotted on the situation display until the aircraft passes out of coverage of the ATS surveillance system, and position information shall be provided to all air traffic services units which may be able to give assistance to the aircraft. Transfer to adjacent sectors shall also be effected when appropriate.

Note. — If the pilot of an aircraft encountering a state of emergency has previously been directed by ATC to select a specific transponder code and/or an ADS-B emergency mode, that code/mode will normally be maintained unless, in special circumstances, the pilot has decided or has been advised otherwise. Where ATC has not requested a code or emergency mode to be set, the pilot will set the transponder to Mode A Code 7700 and/or the appropriate ADS-B emergency mode.

(c) Whenever a general ADS-B emergency alert is observed on the situation display and there is no other indication of the particular nature of the emergency, the controller shall take the following action:

- i. Attempt to establish communication with the aircraft to verify the nature of the emergency; or
- ii. If no response is received from the aircraft, the controller shall attempt to ascertain if the aircraft is able to receive transmission from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed on the situation display.

Note 1. —Some aircraft equipped with first generation ADS-B avionics have the capability to transmit a general emergency alert only, regardless of the code selected by the pilot.

Note 2. — Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

- II. Collision Hazard Information
 - (*a*) When an identified controlled flight is observed to be on a conflicting path with an unknown aircraft deemed to constitute a collision hazard, the pilot of the controlled flight shall, whenever practicable:
 - i. be informed of the unknown aircraft and if so requested by the controlled flight or, if in the opinion of the controller the situation warrants, a course of avoiding action shall be suggested; and
 - ii. be notified when the conflict no longer exists.(b) When an identified IFR flight operating outside controlled airspace is observed to be on a conflicting path with another aircraft, the pilot shall:
 - i. be informed as to the need for collision avoidance action to be initiated, and if so requested by the pilot or if, in the opinion of the controller, the situation warrants, a

course of avoiding action shall be suggested; and

- ii. be notified when the conflict no longer exists.
- (*c*) Information regarding traffic on a conflicting path shall be given, whenever practicable, in the following form:
 - i. relative bearing of the conflicting traffic in terms of the 12-hour clock;
 - ii. distance from the conflicting traffic in kilometers (nautical miles);
 - iii. direction in which the conflicting traffic appears to be proceeding;
 - iv. level and type of aircraft or, if unknown, relative speed of the conflicting traffic, e.g. slow or fast.
- (d) Pressure-altitude-derived level information, even when unverified, shall be used in the provision of collision hazard information because such information, particularly if available from an otherwise unknown aircraft (e.g. a VFR flight) and given to the pilot of a known aircraft, could facilitate the location of a collision hazard.
 - i. When the pressure-altitude-derived level information has been verified, the information shall be passed to pilots in a clear and unambiguous manner. If the level information has not been verified, the accuracy of the information shall be considered uncertain and the pilot shall be informed accordingly.
- III. Failure of Equipment
 - 1. Aircraft Radio Transmitter Failure
 - (a) If two-way communication is lost with an aircraft, the controller shall determine whether or not the aircraft's receiver is functioning by instructing the aircraft on the

channel so far used to acknowledge by making a specified manoeuvre and by observing the aircraft's track, or by instructing the aircraft to operate IDENT or to make SSR code and/or ADS-B transmission changes.

Note 1. — Transponder-equipped aircraft experiencing radio-communication failure will operate the transponder on Mode A Code 7600.

Note 2. — ADS-B-equipped aircraft experiencing radio-communication failure may transmit the appropriate ADS-B emergency and/or urgency mode.

- (b) If the action prescribed in (a) is unsuccessful, it shall be repeated on any other available channel on which it is believed that the aircraft might be listening.
- (c) In both the cases covered by (a) and (b), any manoeuvring instructions shall be such that the aircraft would regain its current cleared track after having complied with the instructions received.
- (d) Where it has been established by the action in (a) that the aircraft's radio receiver is functioning, continued control can be effected using SSR code/ADS-B transmission changes or IDENT transmissions to obtain acknowledgement of clearances issued to the aircraft.
- 2. Complete Aircraft Communication Failure

When a controlled aircraft experiencing complete communication failure is operating or expected to operate in an area and at flight levels where an ATS surveillance service is applied, separation specified in III may continue to be used. However, if the aircraft experiencing the communication failure is not identified, separation shall be applied between identified aircraft and all unidentified aircraft observed along the expected route of the aircraft with the communication failure, until such time as it is known, or can safely be assumed, that the aircraft with radio-communication failure has passed through the airspace concerned, has landed, or has proceeded elsewhere.

- 3. Aircraft Transponder Failure in Areas Where the Carriage of a Functioning Transponder is Mandatory
 - (a) When an aircraft experiencing transponder failure after departure is operating or expected to operate in an area where the carriage of a functioning transponder with specified capabilities is mandatory, the ATC units concerned shall endeavour to provide for continuation of the flight to the aerodrome of first intended landing in accordance with the flight plan. However, in certain traffic situations, either in terminal areas or en-route, continuation of the flight may not be possible, particularly when failure is detected shortly after take-off. The aircraft may then be required to return to the departure aerodrome or to land at the nearest suitable aerodrome acceptable to the operator concerned and to ATC.
 - (b) In case of a transponder failure which is detected before departure from an aerodrome where it is not practicable to effect a repair, the aircraft concerned shall be permitted to proceed, as directly as possible, to the nearest suitable aerodrome where repair can be made. When granting clearance to such aircraft, ATC shall take into consideration the existing or anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight. Subsequent adjustments may become necessary during the course of the flight.

IV. ATS Surveillance System Failure

(a) In the event of complete failure of the ATS surveillance system or total radar failure, where airground communications remain, the controller shall plot the positions of all aircraft already identified, take the necessary action to establish procedural separation between the aircraft and, if necessary, limit the number of aircraft permitted to enter the area.

- (*b*) As an emergency measure, use of flight levels spaced by half the applicable vertical separation minimum may be resorted to temporarily if standard procedural separation cannot be provided immediately.
- V. Degradation of Aircraft Position Source Data

In order to reduce the impact of a degradation of aircraft position source data, for example, a receiver autonomous integrity monitoring (RAIM) outage for GNSS, the ANSP shall establish contingency procedures to be followed by control positions and ATC units in the event of data degradation.

- VI. Ground Radio Failure
 - (a) In the event of complete failure of the ground radio equipment used for control, the controller shall, unless able to continue to provide the ATS surveillance service by means of other available communication channels, proceed as follows:
 - i. without delay inform all adjacent control positions or ATC units, as applicable, of the failure;
 - ii. apprise such positions or units of the current traffic situation;
 - iii. request their assistance, in respect of aircraft which may establish communications with those positions or units, in establishing and maintaining separation between such aircraft; and
 - iv. instruct adjacent control positions or ATC units to hold or re-route all controlled flights outside the area of responsibility of the position or ATC unit that has experienced the failure until such time that the provision of normal services can be resumed.
- (b) In order to reduce the impact of complete ground radio equipment failure on the safety of air traffic, the ANSP shall establish contingency procedures to be followed by control positions and ATC units in the event of such failures. Where feasible and practicable, such contingency procedures shall provide for the delegation of control to an adjacent control position or ATC unit in order to permit a minimum level of services to be provided as soon as possible, following the ground radio failure and until normal operations can be resumed.
- (9) Use of ATS Surveillance Systems in the Approach Control Service
 - I. General Provisions
 - (*a*) ATS surveillance systems used in the provision of approach control service shall be appropriate to the functions and level of service to be provided.
 - (b) ATS surveillance systems used to monitor parallel ILS approaches shall meet the requirements for such operations.
 - II. Functions

The position indications presented on a situation display may be used to perform the following additional functions in the provision of approach control service:

- i. provide vectoring of arriving traffic on to pilot-interpreted final approach aids;
- ii. provide flight path monitoring of parallel ILS approaches and instruct aircraft to take appropriate action in the event of possible or actual penetrations of the no transgression zone (NTZ);
- iii. provide vectoring of arriving traffic to a point from which a visual approach can be completed;
- iv. provide vectoring of arriving traffic to a point from which a precision radar approach or a surveillance radar approach can be made;

- v. provide flight path monitoring of other pilotinterpreted approaches;
- vi. in accordance with prescribed procedures, conduct:
 - A. surveillance radar approaches;
 - B. precision radar (PAR) approaches; and
- vii. provide separation between:
 - A. succeeding departing aircraft;
 - B. succeeding arriving aircraft; and
 - C. a departing aircraft and a succeeding arriving aircraft.
- III. General Approach Radar Procedures Using ATS Surveillance Systems
 - (a) The ANSP shall establish procedures to ensure that the aerodrome controller is kept informed of the sequence of arriving aircraft, as well as any instructions and restrictions which have been issued to such aircraft in order to maintain separation after transfer of control to the aerodrome controller.
 - (b) Prior to, or upon commencement of, vectoring for approach, the pilot shall be advised of the type of approach as well as the runway to be used.
 - (c) The controller shall advise an aircraft being vectored for an instrument approach of its position at least once prior to commencement of final approach.
 - (*d*) When giving distance information, the controller shall specify the point or navigation aid to which the information refers.
 - (e) The initial and intermediate approach phases of an approach executed under the direction of a controller comprise those parts of the approach from the time vectoring is initiated for the purpose of positioning

the aircraft for a final approach, until the aircraft is on final approach and:

- i. established on the final approach path of a pilot-interpreted aid; or
- ii. reports that it is able to complete a visual approach; or
- iii. ready to commence a surveillance radar approach; or
- iv. transferred to the precision radar approach controller.
- (f) Aircraft vectored for final approach shall be given a heading or a series of headings calculated to close with the final approach track. The final vector shall enable the aircraft to be established in level flight on the final approach track prior to intercepting the specified or nominal glide path if an MLS, ILS or radar approach is to be made, and shall provide an intercept angle with the final approach track of 45 degrees or less.
- (g) Whenever an aircraft is assigned a vector which will take it through the final approach track, it shall be advised accordingly, stating the reason for the vector.

IV. Vectoring to Pilot-Interpreted Final Approach Aid

- (*a*) An aircraft vectored to intercept a pilot-interpreted final approach aid shall be instructed to report when established on the final approach track. Clearance for the approach shall be issued prior to when the aircraft reports established, unless circumstances preclude the issuance of the clearance at such time. Vectoring will normally terminate at the time the aircraft leaves the last assigned heading to intercept the final approach track.
- (*b*) The controller shall be responsible for maintaining separation specified in (7) *III* between succeeding aircraft on the same final approach, except that the responsibility may be transferred to the aerodrome controller in accordance with procedures prescribed

by the ANSP and provided an ATS surveillance system is available to the aerodrome controller.

- (c) Transfer of control of succeeding aircraft on final approach to the aerodrome controller shall be effected in accordance with procedures prescribed by the ANSP.
- (*d*) Transfer of communications to the aerodrome controller shall be effected at such a point or time that clearance to land or alternative instructions can be issued to the aircraft in a timely manner.

V. Vectoring for Visual Approach

- (*a*) The controller may initiate vectoring of an aircraft for visual approach provided the reported ceiling is above the minimum altitude applicable to vectoring and meteorological conditions are such that, with reasonable assurance, a visual approach and landing can be completed.
- (*b*) Clearance for visual approach shall be issued only after the pilot has reported the aerodrome or the preceding aircraft in sight, at which time vectoring would normally be terminated.
- VI. Radar Approaches

Note: This section is reserved.

VII. Final Approach Procedures

Note: This section is reserved.

(10) Use of ATS Surveillance Systems in the Aerodrome Control Service

- I. Functions
 - (a) When authorised by and subject to conditions prescribed by the ANSP, ATS surveillance systems may be used in the provision of aerodrome control service to perform the following functions:
 - i. flight path monitoring of aircraft on final approach;

- ii. flight path monitoring of other aircraft in the vicinity of the aerodrome;
- iii. establishing separation specified in (7) *III* between succeeding departing aircraft; and
- iv. providing navigation assistance to VFR flights.
- (*b*) Special VFR flights shall not be vectored unless special circumstances, such as emergencies, dictate otherwise.
- (c) Caution shall be exercised when vectoring VFR flights so as to ensure that the aircraft concerned does not inadvertently enter instrument meteorological conditions.
- (d) In prescribing conditions and procedures for the use of ATS surveillance systems in the provision of aerodrome control service, the ANSP shall ensure that the availability and use of an ATS surveillance system will not be detrimental to visual observation of aerodrome traffic.

Note. — Control of aerodrome traffic is in the main based on visual observation of the manoeuvring area and the vicinity of the aerodrome by the aerodrome controller.

II. Use of ATS surveillance systems for surface movement control

Note. — Requirements concerning surface movement guidance and control systems (SMGCS) are contained in ICAO Annex 14, Volume I, Chapter 9. Guidance on the use of surface movement radar (SMR) and other advanced functions is contained in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476) and in the Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual (Doc 9830).

- 1. General Provisions
 - (*a*) The use of SMR shall be related to the operational conditions and requirements of the particular aerodrome (i.e. visibility

conditions, traffic density and aerodrome layout).

- (*b*) SMR systems shall to the extent possible enable the detection and display of the movement of all aircraft and vehicles on the manoeuvring area in a clear and unambiguous manner.
- (c) Aircraft and vehicle position indications may be displayed in symbolic or non-symbolic form. Where labels are available for display, the capability shall be provided for inclusion of aircraft and vehicle identification by manual or automated means.

2. Functions

- (*a*) SMR shall be used to augment visual observation of traffic on the manoeuvring area and to provide surveillance of traffic on those parts of the manoeuvring area which cannot be observed visually.
- (*b*) The information displayed on an SMR display may be used to assist in:
 - monitoring of aircraft and vehicles on the manoeuvring area for compliance with clearances and instructions;
 - ii. determining that a runway is clear of traffic prior to a landing or take-off;
 - iii. providing information on essential local traffic on or near the manoeuvring area;
 - iv. determining the location of aircraft and vehicles on the manoeuvring area;
 - v. providing directional taxi information to aircraft when requested by the pilot or deemed necessary by the controller. Except under special circumstances, e.g.

emergencies, such information shall not be issued in the form of specific heading instructions; and

- vi. providing assistance and advice to emergency vehicles.
- 3. Identification of Aircraft

Where an ATS surveillance system is used, aircraft may be identified by one or more of the following procedures:

- (*a*) by correlating a particular position indication with:
 - i. an aircraft position visually observed by the controller;
 - ii. an aircraft position reported by the pilot; or
 - iii. an identified position indication displayed on a situation display;
- (*b*) by transfer of identification when authorised by the ANSP; and
- (*c*) by automated identification procedures when authorised by the ANSP.
- (11) Use of ATS Surveillance Systems in the Flight Information Service

Note.— The use of an ATS surveillance system in the provision of flight information service does not relieve the pilot-in-command of an aircraft of any responsibilities, including the final decision regarding any suggested alteration of the flight plan.

I. Functions

The information presented on a situation display may be used to provide identified aircraft with:

 (a) information regarding any aircraft observed to be on a conflicting path with the identified aircraft and suggestions or advice regarding avoiding action;

- (b) information on the position of significant weather and, as practicable, advice to the aircraft on how best to circumnavigate any such areas of adverse weather (see (6) *IX* (*b*), Note);
- (c) information to assist the aircraft in its navigation.

ATS System Capacity and Air Traffic Flow Management

11. (1) Capacity Management -

- I. General
 - (a) The capacity of an ATS system depends on many factors, including the ATS route structure, the navigation accuracy of the aircraft using the airspace, weather related factors, and controller workload. Every effort shall be made to provide sufficient capacity to cater to both normal and peak traffic levels; however, in implementing any measures to increase capacity, the ANSP shall ensure, in accordance with the procedures specified in Chapter 2, that safety levels are not jeopardised.
 - (b) The number of aircraft provided with an ATC service shall not exceed that which can be safely handled by the ATC unit concerned under the prevailing circumstances. In order to define the maximum number of flights which can be safely accommodated, the ANSP shall assess and declare the ATC capacity for control areas, for control sectors within a control area and for aerodromes.
 - (c) ATC capacity shall be expressed as the maximum number of aircraft which can be accepted over a given period of time or at the aerodrome concerned.

Note: -The most appropriate measure of capacity is likely to be the sustainable hourly traffic flow. Such hourly capacities can, for example, be converted into daily monthly or annual values.

- II. Capacity Assessment
 - (*a*) In assessing capacity values, factors to be taken into account shall include, inter alia:

- i. the level and type of ATS provided;
- ii. the structural complexity of the control area, the control sector or the aerodrome concerned;
- iii. controller workload, including control and coordination tasks to be performed;
- iv. the types of communications, navigation and surveillance systems in use, their degree of technical reliability and availability as well as the availability of back-up systems and/or procedures;
- v. availability of ATC systems providing controller support and alert functions; and
- vi. any other factor or element deemed relevant to controller workload.

Note:- Summaries of techniques which may be used to estimate control sector/position capacities are contained in the Air Traffic Services Planning Manual (Doc 9426).

III. Regulation of ATC Capacity and Traffic Volumes

- (a) Where traffic demand varies significantly on a daily or periodic basis, facilities and procedures shall be implemented to vary the number of operational sectors or working positions to meet the prevailing and anticipated demand. Applicable procedures shall be contained in local instructions.
- (b) In case of particular events which have a negative impact on the declared capacity of an airspace or aerodrome, the capacity of the airspace or aerodrome concerned shall be reduced accordingly for the required time period. Whenever possible, the capacity pertaining to such events shall be predetermined.

(c) To ensure that safety is not compromised whenever the traffic demand in an airspace or at an aerodrome is forecast to exceed the available ATC capacity, measures shall be implemented to regulate traffic volumes accordingly.

IV. Enhancement of ATC Capacity

- (a) The ANSP shall:
 - i. periodically review ATS capacities in relation to traffic demand; and
 - ii. provide for flexible use of airspace in order to improve the efficiency of operations and increase capacity.
- (b) In the event that traffic demand regularly exceeds ATC capacity, resulting in continuing and frequent traffic delays, or it becomes apparent that forecast traffic demand will exceed capacity values, the ANSP shall, as far as practicable:
 - i. implement steps aimed at maximising the use of the existing system capacity; and
 - ii. develop plans to increase capacity to meet the actual or forecast demand.

V. Flexible Use of Airspace

- (a) The appropriate authorities shall, through the establishment of agreements and procedures, make provision for the flexible use of all airspace in order to increase airspace capacity and to improve the efficiency and flexibility of aircraft operations.
- (*b*) Agreements and procedures providing for a flexible use of airspace shall specify, inter alia:
 - i. the horizontal and vertical limits of the airspace concerned;
 - ii. the classification of any airspace made available for use by civil air traffic;

- iii. units or authorities responsible for transfer of the airspace;
- iv. conditions for transfer of the airspace to the ATC unit concerned;
- v. conditions for transfer of the airspace from the ATC unit concerned;
- vi. periods of availability of the airspace;
- vii. any limitations on the use of the airspace concerned; and
- viii.any other relevant procedures or information.

(2) Air Traffic Flow Management -

- I. General
 - (*a*) An air traffic flow management (ATFM) service shall be implemented for airspace where traffic demand at times exceeds the defined ATC capacity.
 - (*b*) Certain flights may be exempt from ATFM measures, or be given priority over other flights.
- II. Flow Management Procedures

ATFM shall be carried out in three phases:

- strategic planning, if the action is carried out more than one day before the day on which it will take effect. Strategic planning is normally carried out well in advance, typically two to six (6) months ahead;
- ii. pre-tactical planning, if the action to be taken on the day before the day on which it will take effect;
- iii. tactical operations, if the action is taken on the day on which it will take effect.

III. Strategic Planning

(*a*) Strategic planning shall be carried out in conjunction with ATC and the aircraft operators. It shall consist of

examining the demand for the forthcoming season, assessing where and when demand is likely to exceed the available ATC capacity and taking steps to resolve the imbalance by:

- i. arranging with the ANSP to provide adequate capacity at the required place and time;
- ii. re-routing certain traffic flows (traffic orientation);
- iii. scheduling or rescheduling flights as appropriate; and
- iv. identifying the need for tactical ATFM measures.
- (b) Where traffic orientation scheme (TOS) is to be introduced, the routes shall, as far as practicable, minimise the time and distance penalties for the flights concerned, and allow some degree of flexibility in the choice of routes, particularly for long-range flights.
- (c) When a TOS has been agreed, details shall be published by the ANSP concerned in a common format.

IV. Pre-tactical Planning

Pre-tactical planning shall entail fine tuning of the strategic plan in the light of updated demand data. During this phase:

- i. certain traffic flows may be re-routed;
- ii. off-load routes may be coordinated;
- iii. tactical measures will be decided upon; and
- iv. details for the ATFM plan for the following day shall be published and made available to all concerned.
- V. Tactical Operations
 - (a) Tactical ATFM operations shall consist of:

- i. executing the agreed tactical measures in order to provide a reduced and even flow of traffic where demand would otherwise have exceeded capacity;
- ii. monitoring the evolution of the air traffic situation to ensure that the ATFM measures applied are having the desired effect and to take or initiate remedial action when long delays are reported, including re-routing of traffic and flight level allocation, in order to utilise the available ATC capacity to the maximum extent.
- (b) When the traffic demand exceeds, or is foreseen to exceed, the capacity of a particular sector or aerodrome, the responsible ATC unit shall advise the responsible ATFM unit, where such a unit is established, and other ATC units concerned. Flight crews of aircraft planned to fly in the affected area and operators shall be advised, as soon as practicable, of the delays expected or the restrictions which will be applied.

Note: - Operators known or believed to be concerned will normally be advised by the regional air traffic flow management service, when established.

VI. Liaison

During all phases of ATFM the responsible units shall liaise closely with ATC and the aircraft operators in order to ensure an effective and equitable service.

Note: - Attention is drawn to the guidance material contained in the Air Traffic Services Planning Manual (Doc 9426) regarding flow control as well as to procedures contained in the Regional Supplementary Procedures (Doc 7030) and regional ATFM Handbook.

PART C

FLIGHT INFORMATION SERVICE

(Regulation 32)

The standards to be met for flight information service are as follows:

Scope of Flight Information Service

1. (1) Flight information service shall provide all information likely to affect safety including pertinent—

- (a) SIGMET and AIRMET information;
- (*b*) information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash clouds;
- (*c*) information concerning the release into the atmosphere of radioactive materials or toxic chemicals;
- (*d*) information on changes in the availability of radio navigation services;
- (e) information on changes in condition of aerodromes and associated facilities, including information on the state of the aerodrome movement areas where the aerodrome and movement areas are affected by significant depth of water and any other condition likely to affect safety; and
- (f) information on unmanned free balloons.

(2) Flight information service provided to all flights shall include, in addition to the requirements specified in sub-clause (1), the provision of information concerning -

- (*a*) weather conditions reported or forecast at departure, destination and alternate aerodromes;
- (*b*) collision hazards to aircraft operating in airspace Classes C, D, E, F and G; and
- (c) flight over water areas, where and when requested by a pilot, any available information including radio call sign, position, true track, speed of surface vessels in the area and other relevant information;

(3) ATS units shall transmit, as soon as practicable, special air-reports to other aircraft concerned, to the associated meteorological office, and to other ATS units concerned. Transmissions to aircraft shall be continued for a period to be determined by agreement between the meteorological and air traffic services authorities concerned.

(4) Flight information service provided to VFR flights shall include, in addition to requirements specified in sub-clause (1), the provision of available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the VFR impracticable.

Operational Flight Information Service Broadcasts

2. (1) Meteorological information and operational information concerning radio navigation services and aerodromes included in the flight information service shall, where available, be provided in an operationally integrated form.

(2) Where integrated operational flight information messages are to be transmitted to aircraft, they shall be transmitted with the content and, where specified, in the sequence indicated, for the various phases of flight.

(3) Operational flight information service broadcasts, when provided, shall consist of messages containing integrated information regarding selected operational and meteorological elements appropriate to the various phases of flight. These broadcasts shall be of three major types, i.e. HF, VHF and ATIS.

(4) Where requested by a pilot the applicable operational flight information service messages shall be transmitted by the appropriate ATS unit.

(5) HF operational flight information service (OFIS) broadcasts shall be provided when it has been determined by regional air navigation agreements that a requirement exists.

(6) Whenever such broadcasts are provided:

- (*a*) the information shall be in accordance with (9) below, as applicable, subject to regional air navigation agreements;
- (b) the aerodromes for which reports and forecasts are to be included shall be as determined by regional air navigation agreements;
- (*c*) the time-sequencing of stations participating in the broadcast shall be as determined by regional air navigation agreements;
- (d) the HF OFIS broadcast message shall take into consideration human performance. The broadcast message shall not exceed the length of time allocated for it by regional air navigation agreements, care being taken that the readability is not impaired by the speed of the transmission;

Note. — Guidance material on human performance can be found in the Human Factors Training Manual (Doc 9683).

- (*e*) each aerodrome message shall be identified by the name of the aerodrome to which the information applies;
- (*f*) when information has not been received in time for a broadcast, the latest available information shall be included together with the time of that observation;
- (g) the full broadcast message shall be repeated if this is feasible within the remainder of the time allotted to the broadcasting station;
- (*h*) the broadcast information shall be updated immediately a significant change occurs; and
- (*i*) the HF OFIS message shall be prepared and disseminated by the most appropriate unit(s) as designated by each State.

(7) Pending the development and adoption of a more suitable form of speech for universal use in aeronautical radiotelephony communications, HF OFIS broadcasts concerning aerodromes designated for use by international air services shall be available in the English language.

(8) Where HF OFIS broadcasts are available in more than one language, a discrete channel shall be used for each language.

(9) HF operational flight information service broadcast messages shall contain the following information in the sequence indicated or as determined by regional air navigation agreements:

- (*a*) En-route weather information on significant en-route weather phenomena shall be in the form of available SIGMET as prescribed in Annex 3.
- (b) Aerodrome information including:
 - i. name of aerodrome;
 - ii. time of observation;
 - iii. essential operational information;
 - iv. surface wind direction and speed; if appropriate, maximum wind speed;
 - v. visibility and, when applicable, runway visual range (RVR);
 - vi. present weather;

vii. cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available; and viii. aerodrome forecast.

(10) VHF operational flight information service broadcasts shall be provided as determined by regional air navigation agreements.

(11) Whenever such broadcasts are provided:

- (a) the aerodromes for which reports and forecasts are to be included shall be as determined by regional air navigation agreements;
- (*b*) each aerodrome message shall be identified by the name of the aerodrome to which the information applies;
- (c) when information has not been received in time for a broadcast, the latest available information shall be included together with the time of that observation;
- (*d*) the broadcasts shall be continuous and repetitive;
- (e) The VHF OFIS broadcast message shall take into consideration human performance. The broadcast message shall, whenever practicable, not exceed five minutes, care being taken that the readability is not impaired by the speed of the transmission;

Note. — Guidance material on human performance can be found in the Human Factors Training Manual (Doc 9683).

- (f) the broadcast message shall be updated on a scheduled basis as determined by regional air navigation agreements. In addition it shall be expeditiously updated immediately a significant change occurs; and
- (g) the VHF OFIS message shall be prepared and disseminated by the most appropriate unit(s) as designated by each State.

(12) Pending the development and adoption of a more suitable form of speech for universal use in aeronautical radiotelephony communications, VHF OFIS broadcasts concerning aerodromes designated for use by international air services shall be available in the English language. (13) Where VHF OFIS broadcasts are available in more than one (1) language, a discrete channel shall be used for each language.

(14) VHF operational flight information service broadcast messages shall contain the following information in the sequence indicated:

- (*a*) name of aerodrome;
- *(b)* time of observation;
- (c) landing runway;
- (*d*) significant runway surface conditions and, if appropriate, braking action;
- (*e*) changes in the operational state of the radio navigation services, if appropriate;
- (f) holding delay, if appropriate;
- (g) surface wind direction and speed; if appropriate, maximum wind speed;
- *(*h*) visibility and, when applicable, runway visual range (RVR);
- *(*i*) present weather;
- *(*j*) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility, when available;
- +(*k*) air temperature;
- +(*l*) dew point temperature;
- †(*m*) QNH altimeter setting;
- (*n*) supplementary information on recent weather of operational significance and, where necessary, wind shear;
- (o) trend forecast, when available; and
- (*p*) notice of current SIGMET messages.

(15) Voice-ATIS broadcasts shall meet the following requirements:

- (*a*) be provided at aerodromes where there is a requirement to reduce the communication load on the ATS VHF air-ground communication channels and comprise—
 - (i) one (1) broadcast serving arriving aircraft;
 - (ii) one (1) broadcast serving departing aircraft;
 - (iii) one (1) broadcast serving both arriving and departing aircraft; or
 - (iv) two (2) broadcasts serving arriving and departing aircraft respectively at those aerodromes where the length of a broadcast serving both arriving and departing aircraft would be excessively long;

- (b) use a discrete VHF frequency, where practicable;
- (c) where a discrete VHF frequency is not available, the transmission of the Voice-ATIS broadcast may be made on the voice channel of the most appropriate terminal navigation aid, preferably a VOR, provided that the range and readability are adequate and the identification of the navigation aid is sequenced with the broadcast so that the Voice-ATIS broadcast is not obliterated;
- (*d*) voice-ATIS broadcast shall not be transmitted on the voice channel of an ILS;
- (*e*) where Voice-ATIS is provided, the broadcast shall be continuous and repetitive;
- (*f*) information contained in a current broadcast shall immediately be made known to the ATS unit concerned with the provision to aircraft of information relating to approach, landing and take-off, where the message has not been prepared by that ATS unit; and
- (g) voice-ATIS broadcast provided at designated aerodromes for use by international air services shall be made available in the English language;
- (h) Where Voice-ATIS broadcasts are available in more than one language, a discrete channel shall be used for each language.
- (i) The Voice-ATIS broadcast message shall, whenever practicable, not exceed 30 seconds, care being taken that the readability of the ATIS message is not impaired by the speed of the transmission or by the identification signal of a navigation aid used for transmission of ATIS. The ATIS broadcast message shall take into consideration human performance.

(16) D-ATIS shall meet the following requirements –

- (a) where a D-ATIS supplements the existing availability of Voice-ATIS, the information shall be identical in both content and format to the applicable Voice-ATIS broadcast;
- (*b*) where real-time meteorological information is included but the data remains within the parameters of the significant change criteria, the content shall be considered identical, for the purpose of maintaining the same designator; and

(c) where a D-ATIS supplements the existing availability of Voice-ATIS and the ATIS requires updating Voice-ATIS and D-ATIS shall be updated simultaneously.

(17) Automatic Voice-ATIS and D-ATIS shall meet the following requirement:

- (a) where Voice-ATIS or D-ATIS is provided
 - (i) the information communicated shall relate to a single aerodrome;
 - (ii) the information communicated shall be updated immediately where a significant change occurs;
 - (iii) the preparation and dissemination of the ATIS message shall be the responsibility of the appropriate ATS unit;
 - (iv) individual ATIS messages shall be identified by a designator in the form of a letter of the ICAO spelling alphabet;
 - (v) designators assigned to consecutive ATIS messages shall be in alphabetical order;
 - (vi) flight crew shall acknowledge receipt of the information upon establishing communication with the ATS unit providing approach control service or the aerodrome control tower, as appropriate;
 - (vii) the appropriate ATS unit shall, when replying to the message in paragraph (vi) or, in the case of arriving aircraft, at such other time as may be prescribed by the Authority, provide the aircraft with the current altimeter setting; and
 - (viii) the meteorological information shall be extracted from the local meteorological routine or special report;
- (b) where rapidly changing meteorological conditions make it inadvisable to include a weather report in the ATIS, the ATIS messages shall indicate that the relevant weather information will be given on initial contact with the appropriate ATS unit;

- (c) where information contained in a current ATIS, has been acknowledged as being received by the aircraft concerned, the information received need not be included in a directed transmission to the aircraft, except for the altimeter setting, which shall be provided in accordance with subparagraph (17) (*a*)(vii); and
- (*d*) where an aircraft acknowledges receipt of an ATIS that is not current, any element of information that needs updating shall be transmitted to the aircraft without delay.
- (e) Contents of ATIS shall be kept as brief as possible. Information additional to that specified in (18) to (20) below, for example information already available in aeronautical information publications (AIPs) and NOTAM, shall only be included when justified in exceptional circumstances.

(18) ATIS messages for both arriving and departing aircraft shall contain arrival and departure information in the order listed as follows:

- (*a*) name of aerodrome;
- (b) arrival and departure indicator;
- (c) contract type, where communication is by D-ATIS;
- (*d*) designator;
- (e) time of observation, where appropriate;
- (*f*) type of approaches to be expected;
- (g) the runway in use; and if applicable status of arresting system constituting a potential hazard;
- (*h*) significant runway surface conditions and where appropriate, braking action;
- (*i*) holding delay where appropriate;
- (*j*) transition level where applicable;
- (*k*) other essential operational information;

- (l) surface wind direction and speed, including significant variations and where surface wind sensors related specifically to the sections of runway in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- *(*m*) visibility and when applicable, RVR;
- *(*n*) present weather;
- *(o) cloud below five thousand feet (5,000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- (*p*) air temperature;
- (q) dew point temperature as determined on the basis of regional air navigation agreements;
- (*r*) altimeter setting;
- (s) any available information on significant meteorological phenomena in the approach and climb-out areas including wind shear, and information on recent weather of operational significance;
- (t) trend forecast, when available; and
- (*u*) specific ATIS instructions;

(19) ATIS messages for arriving aircraft containing arrival information only, shall be presented in the order listed as follows:

- (a) name of aerodrome;
- (b) arrival indicator;
- (c) contract type, where communication is by D-ATIS;
- (d) designator;
- (e) time of observation, if appropriate;
- (*f*) type of approach to be expected;

- (g) main landing runway; status of arresting system constituting a potential hazard, if any;
- (*h*) significant runway surface conditions and, if appropriate, braking action;
- (*i*) holding delay, if appropriate;
- (*j*) transition level, if applicable;
- (*k*) other essential operational information;
- (l) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- (*m*) visibility and, when applicable, RVR;
- (*n*) present weather;
- (*o*) cloud below 1,500 m (5,000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- (*p*) air temperature;
- (q) dew point temperature as determined on the basis of regional air navigation agreements;
- (*r*) altimeter setting;
- (*s*) any available information on significant meteorological phenomena in the approach area including wind shear, and information on recent weather of operational significance;
- (*t*) trend forecast, when available; and
- (*u*) specific ATIS instructions;

(20) ATIS messages for departing aircraft containing departure information only, shall be presented in the order listed as follows:

(*a*) name of aerodrome;

- (b) departure indicator;
- (c) contract type, if communication is by D-ATIS;
- (d) designator;
- (e) time of observation, where appropriate;
- (*f*) runways to be used for take-off and where applicable status of arresting system constituting a potential hazard;
- (g) significant surface conditions of runway to be used for takeoff and where appropriate, braking action;
- (*h*) departure delay, where appropriate;
- (*i*) transition level, where applicable;
- (*j*) other essential operational information;
- (k) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runways in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- *(*l*) *visibility* and, when applicable, RVR;
- *(*m*) present weather;
- *(*n*) cloud below 1,500 m (5,000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- (o) air temperature;
- (*p*) dew point temperature as determined on the basis of regional air navigation agreements;
- (q) altimeter setting;
- (*r*) any available information on significant meteorological phenomena in the climb-out area including wind shear;
- (s) trend forecast, when available; and

(*t*) specific ATIS instructions.

Note: The items marked with an asterisk (*) are replaced by the term "CAVOK", where the conditions as specified in the PANS-ATM (Doc 4444), Chapter 11 prevail.

PART D

ALERTING SERVICE

(Regulation 33)

Application

The standards required to be met for alerting service are as follows:

1. (1) Flight information centres or area control centres shall serve as the central point for collecting all information relevant to a state of emergency of an aircraft operating within the flight information region or control area concerned and for forwarding the information to the appropriate rescue coordination centre.

(2) Where there is an emergency affecting an aircraft while the aircraft is under the control of an aerodrome control tower unit or approach control unit, that unit shall immediately notify the flight information centre or area control centre responsible and thereafter the flight information centre or area control centre shall notify the rescue coordination centre.

(3) Subject to sub-clause (2), notification of the area control centre, flight information centre, or rescue coordination centre shall not be required where the nature of an emergency is such that the notification would be superfluous.

(4) Where in an emergency under sub-clause (2), it is determined that the nature of the emergency requires urgent attention, the aerodrome control tower or approach control unit responsible, shall first alert and take other necessary steps to set in motion all appropriate local rescue and emergency organisations which can give the immediate assistance required.

Notification of Rescue Coordination Centres

2. (1) ATS units shall immediately notify rescue coordination centres where an aircraft is considered to be in any phase of a state of emergency set out below:

(a) uncertainty phase when –

- (i) no communication has been received from an aircraft within a period of thirty (30) minutes after the time a communication should have been received, or from the time an unsuccessful attempt to establish communication with the aircraft was first made, whichever is the earlier; or
- (ii) an aircraft fails to arrive within thirty (30) minutes of the estimated time of arrival last notified to or estimated by ATS units, whichever is the later;
- (b) alert phase when
 - (i) following the uncertainty phase, subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft;
 - (ii) the aircraft has been cleared to land and fails to land within five (5) minutes of the estimated time of landing and communication has not been reestablished with the aircraft;
 - (iii) information has been received which indicates that the operating efficiency of aircraft has been impaired, but not to the extent that a forced landing is likely; or
 - (iv) an aircraft is known or believed to be the subject of an act of unlawful interference;
- (c) distress phase when
 - (i) following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the air-craft is in distress; or
 - (ii) the fuel of an aircraft is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety; or
 - (iii) information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely; or

(iv) information in respect of the aircraft is received or it is reasonably certain that the aircraft is about to make or has made a forced landing.

(2) In addition to the requirements under sub-clause (1), rescue coordination centre shall, without delay, be furnished with –

- (*a*) any useful additional information, especially on the development of the state of emergency of an aircraft through subsequent phases; or
- (b) information that the emergency situation no longer exists.

(3) A notification under this clause shall contain information where available in the order listed as follows:

- (*a*) INCERFA, ALERFA or DETRESFA, as appropriate to the phase of the emergency;
- (*b*) agency and person calling;
- (*c*) nature of the emergency;
- (*d*) significant information from the flight plan;
- (e) ATC unit which made last contact, time and means used;
- (*f*) last position report in respect of the aircraft and how determined;
- (g) colour and distinctive marks of aircraft;
- (*h*) dangerous goods carried as cargo on board the aircraft;
- (i) any action taken by reporting office; and
- (*j*) other pertinent remarks.

(4) Such part of the information specified in (3) above, which is not available at the time notification is made to a rescue coordination centre, shall be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

(5) The rescue co-ordination centre shall be provided without delay with –

- (a) any useful additional information especially on the development of the state of emergency through subsequent phases; and
- (b) information that the emergency situation no longer exists.

Information to the Operator

3. (1) Where an area control centre or a flight information centre decides that an aircraft is in the uncertainty or the alert phase, the area control centre or flight information centre shall, where practicable, advise the operator prior to notifying the rescue coordination centre.

(2) All information which has been notified to the rescue coordination centre by an area control centre or flight information centre shall, where practicable, also be communicated, without delay, to the operator.

Use of Communication Facilities

4. ATS units shall, where necessary, use all available communication facilities to establish and maintain communication with an aircraft in an emergency, and to request news of the aircraft.

Plotting Aircraft in a State of Emergency

5. (1) In an emergency, the flight of an aircraft involved shall be plotted on a chart in order to determine the probable future position of the aircraft and its maximum range from its last known position.

(2) Other aircraft known to be operating in the vicinity of the aircraft involved in an emergency shall also be plotted on a chart in order to determine the probable future positions and maximum endurance of those aircraft.

Information to Aircraft Operating in the Vicinity of an Aircraft in a State of Emergency

6. (1) When it has been established by an ATS unit that an aircraft is in a state of emergency, other aircraft known to be in the vicinity of the aircraft involved shall, except as provided in sub-clause (2) be informed of the nature of the emergency as soon as possible.

(2) When an ATS unit knows or believes that an aircraft is being subjected to an act of unlawful interference, no reference shall be made in ATS airground communications to the nature of the emergency unless it has first been referred to in communications from the aircraft involved and it is certain that such reference will not aggravate the situation.

PART E

AIR TRAFFIC SERVICES REQUIREMENTS FOR COMMUNICATIONS

(Regulation 34)

The standards required to be met for ATS communications are as follows-

Aeronautical Mobile Service for Air-Ground Communications

1. (1) Radiotelephony or data link shall be used in air-ground communications for air traffic services.

(2) When direct pilot-controller two-way radiotelephony or data link communication is used for the provision of air traffic control service, recording facilities shall be provided on all air-ground communication channels.

(3) Air-ground communication under sub-clause (2) shall be recorded and retained for a period of at least thirty (30) days.

2. Where RCP types have been prescribed by the Authority for ATM functions, ATS units shall, in addition to the requirements specified in paragraph (1), be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP types.

3. The following standards are required to be met by air-ground communication facilities.

- (a) Flight Information Services: this service shall
 - i. enable two-way communication to take place between ATS unit providing flight information service and appropriately equipped aircraft flying anywhere within the flight information region;
 - ii. Whenever practicable, air-ground communication facilities for flight information service shall permit direct, rapid, continuous and static-free two-way communications.
- (b) Area Control Service: this service shall -

- i. enable two-way communications to take place between a unit providing area control service and appropriately equipped aircraft flying anywhere within the control area;
- ii. Whenever practicable, air-ground communication facilities for area control service shall permit direct, rapid, continuous and static-free two-way communications.
- iii. Where air-ground voice communication channels are used for area control service and are worked by air-ground communicators, suitable arrangements shall be made to permit direct pilot-controller voice communications, as and when required.
- (c) Aerodrome Control Service: this service shall
 - i. this service shall enable direct, rapid, continuous and static-free two-way communications to take place between an aerodrome control tower and appropriately equipped aircraft operating at any distance within 45 kilometres (25 NM) of the aerodrome concerned; and
 - ii. Where conditions warrant, separate communication channels shall be provided for the control of traffic operating on the manoeuvring area.
- (d) Approach Control Service: this service shall—
 - (i) enable direct, rapid, continuous and static-free two-way communications to take place between the unit providing approach control service and appropriately equipped aircraft under its control; and
 - (ii) where an air-ground communication facility is providing approach control service functions under subparagraph
 (i) as a separate unit, air-ground communications shall be conducted over communication channels provided for its exclusive use.

Aeronautical Fixed Service for Ground-Ground Communications

4. (1) Direct-speech or data link communications shall be used in ground ground communications for ATS.

(2) Communications within a flight information region between ATS units shall be as follows:

- (*a*) a flight information centre shall have facilities for communications with the following units providing a service within its area of responsibility:
 - (i) the area control centre, unless collocated;
 - (ii) approach control units; and
 - (iii) aerodrome control towers;
- (b) an area control centre, in addition to being connected to the flight information centre as prescribed in sub-paragraph (*a*), shall have facilities for communications with the following units providing a service within its area of responsibility:
 - (i) approach control units;
 - (ii) aerodrome control towers; and
 - (iii) ATS reporting offices, when separately established.
- (c) an approach control unit, in addition to being connected to the flight information centre and the area control centre as prescribed in subparagraphs (a) and (b), shall have facilities for communications with the associated aerodrome control tower and, where separately established, the associated ATS reporting office; and
- (*d*) an aerodrome control tower, in addition to being connected to the flight information centre, the area control centre and the approach control unit as prescribed in sub-paragraphs (*a*), (*b*) and (*c*), shall have facilities for communications with the associated ATS reporting office, where separately established;

(3) Communication within a flight information region between air traffic services units and other units shall be as follows:

- (a) a flight information centre and an area control centre shall have facilities for communications with the following units providing a service within the respective area of responsibility to the flight information centre and area control centre:
 - (i) appropriate military units;
 - (ii) the meteorological office serving the centre;

- (iii) the aeronautical telecommunications station serving the centre;
- (iv) appropriate operator's offices;
- (v) the rescue coordination centre or, in the absence of a rescue coordination centre, any other appropriate emergency service; and
- (vi) the international NOTAM office serving the centre;
- (*b*) an approach control unit and an aerodrome control tower shall have facilities for communications with the following units providing a service within the respective area of responsibility of the approach control unit and aerodrome control tower:
 - (i) appropriate military units;
 - (ii) rescue and emergency services including ambulance and fire;
 - (iii) the meteorological office serving the unit concerned;
 - (iv) the aeronautical telecommunications station serving the unit concerned; and
 - (v) the unit providing apron management service, when separately established; and
- (c) the communication facilities required under sub-paragraphs
 (a)(i) and (b)(i), shall include provisions for rapid and reliable communications between the ATS unit concerned and the military unit responsible for control of interception operations within the area of responsibility of the ATS unit;

(4) Description of communication facilities within a flight information region shall be as follows:

- (*a*) the communication facilities required under sub-clauses 3(a),
 (3)(*a*)(i) and (3)(*b*)(i), (ii) and (iii), and shall include provisions for—
 - (i) communications by direct speech alone, or in combination with data link communications, whereby for the purpose of transfer of control using

radar or ADS-B the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen (15) seconds; and

- (ii) printed communications, when a written record is required; the message transit time for such communications being no longer than five (5) minutes;
- (b) In all cases not covered by subclause 4(3)(a), the communication facilities shall include provisions for:
 - i. communications by direct speech alone, or in combination with data link communications, whereby the communications can normally be established within fifteen (15) seconds; and
 - ii. printed communications, when a written record is required; the message transit time for such communications being no longer than five (5) minutes.
- (c) in all cases where automatic transfer of data to or from ATS computers is required, suitable facilities for automatic recording shall be provided;
- (d) The communication facilities required in accordance with subclause 4(2)(a) and 4(3)(a) shall be supplemented, as and where necessary, by facilities for other forms of visual or audio communications, for example, closed circuit television or separate information processing systems.
- (e) the communication facilities required under sub-paragraphs
 (3)(a)(i), (ii) and (iii), shall include provisions for communications by direct speech arranged for conference communications;
- (f) The communication facilities required under subclause 4(4)(d) shall include provisions for communications by direct speech arranged for conference communications, whereby the communications can normally be established within fifteen (15) seconds.
- (g) all facilities for direct-speech or data link communications between ATS units or between air traffic services units and other units described under subparagraphs (3)(*a*) and (*b*), shall be provided with automatic recording; and

(*h*) recordings of data and communications as required in subparagraphs (3)(*c*) and (4)(*d*), shall be retained for a period of at least thirty (30) days;

(5) Communications between flight information regions shall be as follows:

- (*a*) flight information centres and area control centres shall have facilities for communications with all adjacent flight information centres and area control centres;
- (b) the communication facilities under subparagraph (5)(*a*), shall in all cases include provisions for messages in a form suitable for retention as a permanent record, and delivery in accordance with transit times specified by regional air navigation agreements;
- (c) unless otherwise prescribed on the basis of regional air navigation agreements, facilities for communications between area control centres serving contiguous control areas shall, in addition, include provisions for direct speech and, where applicable, data link communications, with automatic recording, whereby for the purpose of transfer of control using radar ADS-B or ADS-C data, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen (15) seconds;
- (d) where so required by agreement between the States concerned in order to eliminate or reduce the need for interceptions in the event of deviations from assigned track, facilities for communications between adjacent flight information centres or area control centres other than those mentioned in subparagraphs (5)(c), shall include provisions for direct speech alone, or in combination with data link communications;
- (e) the communication facilities shall be provided with automatic recording;
- (f) The communication facilities in subparagraphs (d) and (e) above shall permit communications to be established normally within fifteen (15) seconds.
- (g) Adjacent ATS units shall be connected in all cases where special circumstances exist.

- (h) Wherever local conditions are such that it is necessary to clear aircraft into an adjacent control area prior to departure, an approach control unit and/or aerodrome control tower shall be connected with the area control centre serving the adjacent area.
- (i) The communication facilities in sub paragraph (g) and (h) shall include provisions for communications by direct speech alone, or in combination with data link communications, with automatic recording, whereby for the purpose of transfer of control using radar, ADS-B or ADS-C data, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen (15) seconds.
- (*j*) in all cases where automatic exchange of data between ATS computers is required, suitable facilities for automatic recording shall be provided; and
- (*k*) recordings of data and communications as required in paragraph (5)(*f*), shall be retained for a period of at least thirty (30) days.
- (6) Procedures for direct-speech communications shall be as follows -
 - (a) Appropriate procedures for direct speech communications shall be developed to permit immediate connections to be made for very urgent calls concerning the safety of aircraft, and the interruption, if necessary, of less urgent calls in progress at the time.

5. Where RCP types have been prescribed by the Authority for ATM functions, ATS units shall, in addition to the requirements specified in paragraph 1., be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP types.

Surface Movement Control Service

6. Communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes shall be as follows:

 (a) two-way radiotelephony communication facilities shall be provided for aerodrome control service for the control of vehicles on the manoeuvring area, except where communication by a system of visual signals is deemed to be adequate;

- (*b*) where conditions warrant, separate communication channels with automatic recording facilities shall be provided for the control of vehicles on the manoeuvring area; and
- (*c*) recordings of communications as required in paragraph (*b*), shall be retained for a period of at least thirty (30) days;

Aeronautical Radio Navigation Service

- 7. Automatic recording of surveillance data shall be as follows:
 - (*a*) appropriate data from surveillance equipment or other systems such as ADS-B and ADS-C used as an aid to ATS, shall be automatically recorded for use in—
 - (i) accident and incident investigations;
 - (ii) search and rescue;
 - (iii) air traffic control; and
 - (iv) surveillance systems evaluation and training;
 - (*b*) automatic recordings of surveillance data shall be retained for a period of at least thirty (30) days;
 - (*c*) where the recordings under paragraph (*b*) are pertinent to accident and incident investigations, they shall be retained for longer periods until it is evident that the recordings are no longer required.

PART F

(Regulation 35)

AIR TRAFFIC SERVICES REQUIREMENTS FOR INFORMATION

The standards required to be met for Air Traffic Services Requirements for information are as follows:

Meteorological Information

1. (1) ATS units shall be supplied with up-to-date information on existing and forecast meteorological conditions as necessary for the performance of their respective functions.
(2) The information under subparagraph (1), shall be supplied in such a form as to require a minimum of interpretation on the part of air traffic services personnel and with a frequency which satisfies the requirements of the air traffic services units concerned.

(3) Air traffic services units shall be supplied with available detailed information on the location, vertical extent, direction and rate of movement of meteorological phenomena in the vicinity of the aerodrome, and particularly in the climbout and approach areas, which could be hazardous to aircraft operations.

(4) When computer-processed upper air data are made available to air traffic services units in digital form for use by air traffic services computers, the contents, format and transmission arrangements shall be as agreed between the Meteorological Authority and the appropriate ATS Authority.

(5) ATS units shall be supplied with available detailed information on the location, vertical extent, direction and rate of movement of metrological phenomena in the vicinity of the aerodrome and particularly in the climb-out and approach areas, which could be hazardous to aircraft operations.

2. Flight information centres and area control centres:

- (a) Flight information centres and area control centres shall be supplied with meteorological information as described in Annex 3, Appendix 9, 1.3, covering the flight information region or control area and such other areas as may be determined on the basis of regional air navigation agreements particular emphasis being given to the occurrence or expected occurrence of weather deterioration as soon as this can be determined; and
- (*b*) flight information centres and area control centres shall be provided, at suitable intervals, with current pressure data for setting altimeters, for locations specified by the flight information centre or area control centre concerned.
- 3. Units providing approach control service:
 - (a) units providing approach control service shall be supplied with meteorological Information as described in Annex 3, Appendix 9, 1.2 for the airspace and the aerodromes with which units providing approach control service are concerned;
 - (*b*) special reports and amendments to forecasts shall be communicated to the units providing approach control

service as soon as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast;

- (c) where multiple sensors are used, the displays to which the multiple sensors are related shall be clearly marked to identify the runway and section of the runway monitored by each sensor.
- (*d*) units providing approach control service shall be provided with current pressure data for setting altimeters, for locations specified by the unit providing approach control service;
- (e) units providing approach control service for final approach, landing and take-off shall be equipped with surface wind display;
- (*f*) the display under paragraph (*e*), shall be related to the same location of observation and be fed from the same sensor as the corresponding display in the aerodrome control tower and in the meteorological station, where a meteorological station exists;
- (g) units providing approach control service for final approach, landing and take-off at aerodromes where runway visual range values are assessed by instrumental means shall be equipped with display permitting read-out of the current RVR value;
- (*h*) the display under paragraph (*g*), shall be related to the same location of observation and be fed from the same sensor as the corresponding displays in the aerodrome control tower and in the meteorological station, where a meteorological station exists;
- (i) Units providing approach control service for final approach, landing and take-off at aerodromes where the height of cloud base is assessed by instrumental means shall be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays shall be related to the same location(s) of, observations and be fed from the same sensor(s) as the corresponding display(s) in the aerodrome control tower and in the meteorological station, where such a station exists; and
- (*j*) units providing approach control service for final approach, landing and take-off shall be supplied with information on

wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach.

- 4. Aerodrome control towers:
 - (a) aerodrome control towers shall be supplied with meteorological information as described in Annex 3, Appendix 9, 1.1 for the aerodrome with which they are concerned
 - (b) special reports and amendments to forecasts shall be communicated to the aerodrome control towers as soon as the special reports and amendments to forecasts become necessary in accordance with established criteria, without waiting for the next routine report or forecast;
 - (c) aerodrome control towers shall be provided with current pressure data for setting altimeters for the aerodrome concerned;
 - (*d*) aerodrome control towers shall be equipped with surface wind display;
 - (e) the display under paragraph (d), shall be related to the same location of observation and be fed from the same sensor as the corresponding display in the meteorological station, where such a station exists;
 - (f) where multiple sensors are used, the displays to which the multiple sensors are related shall be clearly marked to identify the runway and section of the runway monitored by each sensor;
 - (g) aerodrome control towers at aerodromes where RVR range values are measured by instrumental means shall be equipped with display permitting read-out of the current RVR value;
 - (h) the display under paragraph (g), shall be related to the same location of observation and be fed from the same sensor as the corresponding display in the meteorological station, where a meteorological station exists; and
 - (i) aerodrome control towers at aerodromes where the height of cloud base is assessed by instrumental means shall be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays shall be related to the same location(s) of

observations and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.

- (*j*) aerodrome control towers shall be supplied with information on wind shear which can adversely affect aircraft on the approach or take-off paths or during circling approach and aircraft on the runway during the landing roll or take-off run.
- (k) aerodrome control towers and/or other appropriate units shall be supplied with aerodrome warnings.
- **5.** Communication stations:
 - (*a*) where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to communication stations;
 - (*b*) a copy of the information under paragraph (*a*), shall be forwarded to the flight information centre or the area control centre.

Information on Aerodrome Condition and the Operational Status of Associated Facilities

6. Aerodrome control towers and units providing approach control service shall be kept currently informed of the operationally significant conditions of the movement area, including the existence of temporary hazards, and the operational status of any associated facilities at the aerodrome with which aerodrome control towers and approach control units are concerned.

Information on the Operational Status of Navigation Services

7. (1)ATS units shall be kept currently informed of the operational status of radio navigation services, and those visual aids essential for take-off, departure, approach and landing procedures within the area of responsibility of the ATS units and those radio navigation services and visual aids essential for surface movement.

(2) Information on the operational status, and any changes thereto, of radio navigation services and visual aids as referred to in sub paragraph (1) shall be received by the appropriate ATS unit(s) on a timely basis consistent with the use of the service(s) and aid(s) involved.

Information on Unmanned Free Balloons

8. Operators of unmanned free balloons shall keep the appropriate ATS units informed of details of flights of unmanned free balloons in accordance with the provisions contained in Civil Aviation Operations Regulations.

Information Concerning Volcanic Activity

9. (1) ATS units shall be informed, in accordance with local agreement, of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud which could affect airspace used by flights within the area of responsibility of the ATS units.

(2) Area control centres and flight information centres shall be provided with volcanic ash advisory information issued by the associated volcanic ash advisory information centre.

Information Concerning Radioactive Materials and Toxic Chemical "Clouds"

10. ATS units shall be informed, in accordance with local agreement, of the release into the atmosphere of radioactive materials or toxic chemicals which could affect airspace used by flights within the area of responsibility of the ATS units.

SCHEDULE 2

PRINCIPLES GOVERNING NAVIGATION SPECIFICATIONS AND ATS ROUTES

[Schedule 1 – Part A, Clause 11]

PRINCIPLES GOVERNING THE IDENTIFICATION OF NAVIGATION SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES

Note: See Schedule 4 concerning the identification of standard departure and arrival routes and associated procedures. Guidance material on the establishment of these routes and procedures is contained in the Air Traffic Services Planning Manual (Doc 9426).

Designators for ATS routes and Navigation Specifications

1.(1) The purpose of a system of route designators and navigation specification applicable to specified ATS route segment, route or area is to allow both pilots and ATS, taking into account automation requirements –

- (*a*) to make unambiguous reference to any ATS route with-out the need to resort to the use of geographical co-ordinates or other means in order to describe it;
- (*b*) to relate an ATS route to a specific vertical structure of the airspace, as applicable;
- (*c*) to indicate a required level of navigation performance accuracy where operating along an ATS route or within a specified area; and
- (*d*) to indicate that a route is used primarily or exclusively by certain types of aircraft.

Note 1-Specifications governing the publication of navigation specification are given in Part C of Schedule 3, and Schedule 10.

Note 2-In relation to this Schedule and for flight planning purposes, a prescribed navigation specification is not considered an integral part of the ATS route designator.

(2) In order to satisfy the requirements under sub-clause (1), the designation system shall—

- (*a*) permit the identification of any ATS route in a simple and unique manner;
- (b) avoid redundancy;
- (c) be usable by both ground and airborne automation systems;
- (*d*) permit utmost brevity in operational use; and
- *(e)* provide sufficient possibility of extension to cater for any future requirements without the need for fundamental changes.

Composition, Assignment and Use of Designators

2. Controlled, advisory and uncontrolled ATS routes, with the exception of standard arrival and departure routes, shall be as specified in clauses 3, 4 and 5.

Composition of Designator

3. (1) An ATS route designator shall consist of a basic designator supplemented, where necessary, by -

- (*a*) one (1) prefix as prescribed in sub-clause (6); and
- (*b*) one (1) additional letter as prescribed in sub-clause (7).

(2) The number of characters required to compose the designator shall not exceed six (6) characters.

(3) The number of characters required to compose the designator shall, where possible, be kept to a maximum of five (5) characters.

(4) The basic designator shall consist of one (1) letter of the alphabet followed by a number from 1 to 999.

(5) Selection of a letter referred to in sub-clause (4) shall be made from the following list of letters as applicable:

- (*a*) A, B, G and R for routes that form part of the regional networks of ATS routes and are not area navigation routes;
- (*b*) L, M, N and P for area navigation routes that form part of the regional networks of ATS routes;
- (c) H, J, V and W for routes that do not form part of the regional networks of ATS routes and are not area navigation routes; and
- (*d*) Q, T, Y and Z for area navigation routes that do not form part of the regional networks of ATS routes.

(6) Where applicable, one (1) supplementary letter shall be added as a prefix to the basic designator in accordance with the following standards:

(*a*) K to indicate a low-level route established for use primarily by helicopters;

- (*b*) U to indicate that the route or portion thereof is established in the upper airspace; and
- (c) S to indicate a route established exclusively for use by supersonic aircraft during acceleration, deceleration and while in supersonic flight.

(7) When prescribed by the appropriate ATS authority or on the basis of regional air navigation agreements, a supplementary letter may be added after the basic designator of the ATS route in question in order to indicate the type of service provided in accordance with the following standards:

- (*a*) the letter F to indicate that on the route or portion of the route, advisory service only is provided; and
- (*b*) the letter G to indicate that on the route or portion of the route, flight information service only is provided.

Note 1-Due to limitations in the display equipment on board an aircraft, the supplementary letters "F" or "G" may not be displayed to the pilot.

Note 2—Implementation of a route or a portion thereof as a controlled route, advisory route or flight information route is indicated in aeronautical charts and aeronautical information publications in accordance with the requirements in Schedule 8 and 16.

Assignment of Basic Designators

4. Basic ATS route designators shall be assigned in accordance with the following principles.

(a) the same basic designator shall be assigned to a main trunk route throughout the entire length of the route, irrespective of terminal control areas, States or regions traversed;

Note—The principle under paragraph (a) is of particular importance where automated ATS data processing and computerised airborne navigation equipment is used.

(*b*) where two (2) or more trunk routes have a common segment, the segment in question shall be assigned to each of the designators of the routes concerned, except where this would present difficulties in the provision of ATS, in which case, by common agreement, one (1) designator only shall be assigned;

- (*c*) a basic designator assigned to one (1) route shall not be assigned to any other route; and
- (*d*) the Authority shall notify the Regional Offices of ICAO for coordination of its requirements for designators.

Use of Designators in Communications

5. (1) In printed communications, the designator shall be expressed at all times by not less than two (2) and not more than six (6) characters.

(2) In voice communications, the basic letter of a designator shall be spoken in accordance with the ICAO spelling alphabet.

(3) Where the prefixes K, U or S specified in sub-clause 3(6), are used, the prefixes, shall, in voice communications, be spoken as follows:

- (*a*) K-KOPTER; (The word "KOPTER" shall be pronounced as in the word "helicopter")
- (*b*) U–UPPER; and
- (c) S-SUPERSONIC.

(4) Where the letters F, or G specified in sub-clause 3 (7) are used, the flight crew shall not be required to use these letters in voice communications.

SCHEDULE 3

PRINCIPLES GOVERNING SIGNIFICANT POINTS

[Schedule 1, Part A, Clause 14]

PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

1. (1) Significant points shall, where possible, be established with reference to ground-based radio navigation aids, preferably VHF or higher frequency aids.

(2) Where ground-based radio navigation aids do not exist, significant points shall be established at locations that can be determined by self-contained airborne navigation aids, or, where navigation by visual reference to the ground is to be effected, by visual observation.

(3) Specific points may be designated as "transfer of control" points by agreement between adjacent air traffic control units or control positions concerned.

Designators for Significant Points Marked by the Site of a Radio Navigation Aid

2. (1) Whenever practicable, a significant point marked by the site of a radio navigation aid shall be named with reference to an identifiable and preferably prominent geographical location.

(2) In selecting a name for the significant point under sub-clause (1), care shall be taken to ensure that the following conditions are met:

- (a) the name shall not create difficulties in pronunciation for pilots or ATS personnel when speaking in the language used in ATS communications;
- (b) where the name of a geographical location in the national language selected for designating a significant point gives rise to difficulties in pronunciation, an abbreviated or contracted version of this name, which retains as much of its geographical significance as possible, shall be selected, for example: FUERSTENFELDBRUCK = FURSTY;
- (c) the name shall be easily recognisable in voice communications and shall be free of ambiguity with those of other significant points in the same general area and shall not create confusion with respect to other communications exchanged between air traffic services and pilots;
- (*d*) the name shall, where possible, consist of at least six (6) letters and form two (2) syllables and preferably not more than three (3);
- *(e)* the selected name shall be the same for both the significant point and the radio navigation aid marking the significant point.

(3) Composition of coded designators for significant points marked by the site of a radio navigation aid shall be the same as the radio identification of the radio navigation aid and shall be so composed, where possible, as to facilitate association with the name of the point in plain language.

(4) Coded designators for significant points marked by the site of a radio navigation aid, shall not be duplicated within 1 100 km or 600 NM of the location of the radio navigation aid concerned, except where two (2) radio navigation aids operating in different bands of the frequency spectrum are situated at the same location, the radio identification of the two (2) radio navigation aids are normally the same.

(5) The Authority shall notify the Regional Offices of ICAO for coordination, of its requirements for coded designators.

Designators for Significant Points not Marked by the Site of a Radio Navigation Aid

3. (1) Where a significant point is required at a position not marked by the site of a radio navigation aid and is used for ATC purpose, it shall be designated by a unique five-letter pronounceable name-code which will then serve as the name as well as the coded designator of the significant point.

(2) The name-code designator under sub-clause (1), shall be selected so as to avoid any difficulties in pronunciation by pilots or ATS personnel when speaking in the language used in ATS communications, for example, ADOLA and KODAP.

(3) The name-code designator shall be easily recognisable in voice communications and shall be free of ambiguity with those used for other significant points in the same general area.

(4) The unique five-letter pronounceable name-code designator assigned to a significant point shall not be assigned to any other significant point.

(5) The Authority shall notify the Regional Offices of ICAO for coordination, of its requirements for name-code designators.

(6) In areas where no system of fixed routes is established or where the routes followed by aircraft vary depending on operational considerations, significant points shall be determined and reported in terms of WGS-84 geographical coordinates, except that permanently established significant points serving as exit or entry points into such areas shall be designated in accordance with the applicable provisions in clauses 2 or 3.

(7) Where there is a need to relocate a significant point, a new namecode designator shall be chosen. (8) Where the Authority wishes to keep the allocation of specific namecodes for reuse at a different location, such name-codes shall not be used until after a period of at least six (6) months.

(9) The requirements of the Authority for unique five-letter pronounceable name-code designator shall be notified to the Regional Office of ICAO for coordination.

Use of Designators in Communications

4. (1) The name selected in accordance with clause 2 or 3 shall be used to refer to the significant point in voice communications.

(2) Where the coded designator is used in voice communications, it shall be spoken in accordance with the ICAO spelling alphabet.

(3) Only the coded designator or the selected name-code shall be used to refer to a significant point in printed and coded communications.

Significant Points Used for Reporting Purposes

5. (1) In order to permit ATS to obtain information regarding the progress of aircraft in flight, selected significant points may need to be designated as reporting points.

(2) In establishing selected significant points as reporting points, consideration shall be given to the following factors:

- (*a*) the type of ATS provided;
- (*b*) the amount of traffic normally encountered;
- (*c*) the accuracy with which aircraft are capable of adhering to the current flight plan;
- (*d*) the speed of the aircraft;
- (*e*) the separation minima applied;
- (*f*) the complexity of the airspace structure;
- (*g*) the control method employed;

- (*h*) the start or end of significant phases of a flight such as climb, descent and change of direction;
- (*i*) transfer of control procedures;
- (*j*) safety aspects;
- (*k*) search and rescue aspects; and
- (*l*) the cockpit and air-ground communication workload.

(3) Reporting points shall be established as either "compulsory" or "on-request".

(4) In establishing compulsory reporting points the following principles shall apply:

- (a) compulsory reporting points shall be limited to the minimum necessary for the routine provision of information to ATS units on the progress of aircraft in flight, bearing in mind the need to keep cockpit and controller workload and air-ground communications load to a minimum;
- (*b*) the availability of a radio navigation aid at a location shall not necessarily determine its designation as a compulsory reporting point; and
- (c) compulsory reporting points shall not necessarily be established at flight information region or control area boundaries.

(5) On request reporting points may be established in relation to the requirements of ATS for additional position reports where traffic conditions so demand.

(6) The designation of "compulsory" and "on request" reporting points shall be reviewed regularly to keep the requirements for routine position reporting to the minimum necessary to ensure efficient ATS.

(7) Routine reporting over compulsory reporting points shall not systematically be made mandatory for all flights in all circumstances and in applying this principle, particular attention shall be given to the following:

(*a*) high-speed, high-flying aircraft shall not be required to make routine position reports over all reporting points established as compulsory for low speed, low-flying aircraft; and (*b*) aircraft transiting through a terminal control area shall not be required to make routine position reports as frequently as arriving and departing aircraft.

(8) In areas where the principles regarding the establishment of reporting points would not be practicable, a reporting system with reference to meridians of longitude or parallels of latitude expressed in whole degrees may be established.

SCHEDULE 4

PRINCIPLES GOVERNING STANDARD ARRIVAL & DEPARTURE ROUTES

[Schedule 1, Part A - clause 11]

PRINCIPLES GOVERNING THE IDENTIFICATION OF STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES

Designators for Standard Departure and Arrival Routes and Associated Procedures

- 1. In clause 2 "route" means route and associated procedures.
- 2. (1) The system of designators shall
 - (*a*) permit the identification of each route in a simple and unambiguous manner;

- (b) make a clear distinction between
 - i. departure routes and arrival routes;
 - ii. departure or arrival routes and other ATS routes; and
 - iii. routes requiring navigation by reference to ground-based radio aids or self-contained airborne aids, and routes requiring navigation by visual reference to the ground;
- *(c)* be compatible with ATS and aircraft data processing and display requirements;
- (*d*) be of utmost brevity in its operational application;
- (e) avoid redundancy; and
- *(f)* provide sufficient possibility for extension to cater for any future requirements without the need for fundamental changes.

(2) Each route shall be identified by a plain language designator and a corresponding coded designator.

(3) The designators shall, in voice communications, be easily recognisable as relating to a standard departure or arrival route and shall not create any difficulties in pronunciation for pilots and ATS personnel.

Composition of Designators

3. (1) The plain language designator of a standard departure or arrival route shall consist of the following in the order listed:

- (*a*) a basic indicator;
- (*b*) a validity indicator;
- (c) a route indicator, where required;
- (*d*) the word "departure" or "arrival"; and
- (*e*) the word "visual", where the route has been established for use by aircraft operating in accordance with the VFR.

(2) The basic indicator shall be the name or name-code of the significant point where a standard departure route terminates or a standard arrival route begins.

(3) The validity indicator shall be a number from 1 to 9.

(4) The route indicator shall be designated one (1) letter of the alphabet, excluding the use of the letters "I" and "O".

4. The coded designator of a standard departure or arrival route, instrument or visual, shall consist of the following in the order listed:

- (*a*) the coded designator or name-code of the significant point described in paragraph 3(1)(*a*);
- (b) the validity indicator specified under paragraph 3(1)(b); and
- (*c*) the route indicator specified in paragraph 3(1)(*c*) where required.

Note: Limitations in the display equipment on board an aircraft may require shortening of the basic indicator, where the indicator is a five-letter name-code, for example KODAP. The manner in which such an indicator is shortened is left to the discretion of operators.

Assignment of Designators

5. (1) Each route shall be assigned a separate designator.

(2) To distinguish between two (2) or more routes which relate to the same significant point and therefore are assigned the same basic indicator, a separate route indicator as required under clause 3(4), shall be assigned to each route.

Assignment of Validity Indicators

6. (1) A validity indicator shall be assigned to each route to identify the route which is in effect.

(2) The first validity indicator to be assigned shall be the number "1".

(3) Where a route is amended, a new validity indicator, consisting of the next higher number, shall be assigned.

(4) Where the validity indicator "9" has been assigned, the next new validity indicator shall be the number "1".

Examples of Plain Language and Coded Designators

- 7. (1) Example 1: Standard departure route—instrument:
 - (a) Plain language BRECON ONE designator: DEPARTURE
 - (b) Coded designator: BCN 1

Meaning: The designator identifies a standard instrument departure route which terminates at the significant point BRECON which is the basic indicator. BRECON is a radio navigation facility with the identification BCN which is the basic indicator of the coded designator. The validity indicator ONE which is (1) in the coded designator, signifies either that the original version of the route is still in effect or that a change has been made from the previous version NINE (9) to the now effective version ONE (1) as provided in sub-clause 6(3). The absence of a route indicator as provided in clauses 3(4) and 5(2), signifies that only one route, in this case a departure route, has been established with reference to BRECON.

- (2) Example 2: Standard arrival route instrument:
 - (a) Plain language KODAP TWO ALPHA designator: ARRIVAL
 - (b) Coded designator: KODAP 2 A

Meaning: This designator identifies a standard instrument arrival route which begins at the significant point KODAP which is the basic indicator. KODAP is a significant point not marked by the site of a radio navigation facility and is therefore assigned a five-letter name-code in accordance with Schedule 3. The validity indicator TWO (2) signifies that a change has been made from the previous version ONE (1) to the now effective version TWO (2). The route indicator ALPHA (A) identifies one of several routes established with reference to KODAP and is a specific character assigned to this route.

- (3) Example 3: Standard departure route visual:
 - (a) Plain language ADOLA FIVE BRAVO designator: DEP-ARTURE VISUAL
 - (b) Coded designator: ADOLA 5 B

Meaning: This designator identifies a standard departure route for controlled VFR flights which terminates at ADOLA, a significant point not marked by the site of a radio navigation facility. The validity indicator FIVE (5) signifies that a change has been made from the previous version FOUR (4) to the now effective version FIVE (5). The route indicator BRAVO (B) identifies one of several routes established with reference to ADOLA.

Composition of Designators for MLS with RNAV Approach procedures

8. (1) The plain language designator of an MLS with RNAV approach procedure shall consist of the following in the order listed:

- (a) MLS;
- (b) a basic indicator;
- (c) a validity indicator;
- (*d*) a route indicator;
- (e) the word "approach"; and
- (*f*) the designator of the runway for which the procedure is designed.

(2) The basic indicator shall be the name or name-code of the significant point where the approach procedure begins.

(3) The validity indicator shall be a number from 1 to 9.

(4) The route indicator shall be designated one (1) letter of the alphabet excluding the use of the letters "I" and "O".

(5) The designator of the runway shall be in accordance with Volume 1, 5.2.2 of Annex 14 of the Chicago Convention.

9. (1) The coded designator of an MLS with RNAV approach procedure shall consist of the following in the order listed:

- (a) MLS;
- (*b*) the coded designator or name-code of the significant point described in paragraph 7(1)(*b*);

- (c) the validity indicator in paragraph 8(1)(c), 8(3);
- (d) the route indicator in paragraph 8(1)(d), 8(4); and
- (*e*) the runway designator in paragraph 8(1)(*f*), 8(5).

10.(1) The assignment of designators for MLS with RNAV approach procedures shall be in accordance with clause 5.

(2) Procedures having identical tracks but different flight profiles shall be assigned separate route indicators.

(3) The route indicator letter for MLS with RNAV approach procedures shall be assigned uniquely to all approaches at an airport until all the letters have been used and only then shall the route indicator letter be repeated.

(4) The use of the same route indicator for two (2) routes using the same MLS ground facility shall not be permitted.

(5) The assignment of validity indicator for approach procedures shall be in accordance with clause 6.

11.(1) Example of plain language and coded designators:

(a) Plain language MLS HAPPY ONE ALPHA designator: APPROACH RUNWAY ONE EIGHT LEFT

(b) Coded designator: MLS HAPPY 1 A 18L Meaning: The designator identifies an MLS with RNAV approach procedure which begins at the significant point HAPPY which is basic indicator. HAPPY is a significant point not marked by the site of a radio navigation facility and therefore assigned a five letter name-code in accordance with Schedule 3. The validity indicator ONE (1) signifies that either the original version of the route is still in effect or a change has been made from the previous version NINE (9) to the now effective version ONE (1). The route indicator ALPHA (A) identifies one of several routes established with reference to HAPPY and is a specific character assigned to this route.

Use of Designators in Communications

12.(1) In voice communications, only the plain language designator shall be used.

Note: For the purpose of identification of routes, the words "departure", "arrival" and "visual" described in paragraphs 3(1)(d)(e) are considered to be an integral element of the plain language designator.

(2) In printed or coded communications, only the coded designator shall be used.

Display of Routes and Procedures to Air Traffic Control

13. (1) A detailed description of each currently effective standard departure or arrival route and approach procedure, including the plain language designator and the coded designator, shall be displayed at the working positions at which the routes procedures are assigned to aircraft as part of an ATC clearance, or are otherwise of relevance in the provision of ATS.

(2) Whenever possible, a graphic portrayal of the routes and procedures shall also be displayed.

Note: Material relating to the establishment of standard departure and arrival routes and associated procedures is contained in the Air Traffic Services Planning Manual, Doc 9426.

SCHEDULE 5

ATS AIRSPACE CLASSES

(Schedule 1, Part A - Clause 5)

ATS AIRSPACE CLASSES-SERVICES PROVIDED AND FLIGHT REQUIREMENTS

| Class | Type of Flight | Separation Provided | Service Provided | Speed Limitation* | Radio Communication Requirements | Subject to an ATC Clearance |
|-------|-------------------|-----------------------------|---------------------|----------------------|--|-----------------------------------|
| IFR | All aircraft | Air traffic control service | Not | Continuous | Yes | IFR |
| Only | | | applicable | two way | | Only |
| IFR | All aircraft | Air traffic control service | Not | Continuous | Yes | IFR |
| | | | applicable | two way | | |
| VFR | All aircraft | Air traffic control service | Not | Continuous | Yes | VFR |
| | | | applicable | two way | | |

| IFR | IFR from | Air traffic control service | Not | Continuous | Yes | IFR |
|-----|-------------|--------------------------------------|-------------|------------|-----|-----|
| | IFR | | applicable | two way | | |
| VFR | VFR from | 1) Air traffic service for | 250 kts | Continuous | Yes | VFR |
| | IFR | separation from IFR; | IAS | two way | | |
| | | 2) VFR/VFR traffic information | below | | | |
| | | (and traffic avoidance advice on | 3050m | | | |
| | | request) | (10,000 ft) | | | |
| | | | AMSL | | | |
| IFR | IFR from | Air traffic control service, traffic | 250 kts | Continuous | Yes | IFR |
| | IFR | information about VFR flights | IAS | two way | | |
| | | (and traffic avoidance advice on | below | | | |
| | | request) | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| VFR | Nil | Air traffic control service and as | 250 kts | Continuous | Yes | VFR |
| | | far as practicable traffic | IAS | two way | | |
| | | information about VFR flights | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| IFR | IFR from | Traffic information as far as | 250 kts | Continuous | Yes | IFR |
| | IFR | practicable | IAS | two way | | |
| | | | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| VFR | Nil | Air traffic advisory service; | 250 kts | No | No | VFR |
| | | flight information service | IAS | | | |
| | | | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| IFR | IFR from | Flight information service | 250 kts | Continuous | No | IFR |
| | IFR as far | | IAS | two way | | |
| | as | | below | | | |
| | practicable | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| VFR | Nil | Flight information service | 250 kts | No | No | VFR |
| | | | IAS | | | |
| | | | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| IFR | Nil | Flight information service | 250 kts | Continuous | No | IFR |
| | | | IAS | two way | | |
| | | | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |
| VFR | Nil | Flight information service | 250 kts | No | NO | VFR |
| | | | IAS | | | |
| | | | below | | | |
| | | | 3050m | | | |
| | | | (10,000 ft) | | | |
| | | | AMSL | | | |

SCHEDULE 6

AERONAUTICAL DATA QUALITY REQUIREMENTS

[Schedule 1, Part A - Clause 23]

| Table 1 - Latitude and Longitude | | | | | |
|--|------------------|----------------------------|--|--|--|
| Latitude and Longitude | Chart Resolution | Integrity / classification | | | |
| Flight information region boundary points | As plotted | routine | | | |
| P, R, D area boundary points (outside CTA/CTZ boundaries) | As plotted | routine | | | |
| P, R, D area boundary points (inside CTA/CTZ boundaries) | As plotted | essential | | | |
| CTA/CTZ boundary points | As plotted | essential | | | |
| En route navaids, intersections and waypoints, and holding STAR/SID points | 1 sec | essential | | | |
| Obstacles in Area 1 (the entire State territory) | As plotted | routine | | | |
| Aerodrome/heliport reference point | 1 sec | routine | | | |

| NAVAIDS located at aerodrome/heliport | As plotted | essential | |
|---|---------------------------------|-------------------------------|--|
| Obstacles in Area 3 | 1/10 sec | essential | |
| Obstacle in Area 2 | 1/10 sec | essential | |
| Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure | 1 sec | essential | |
| Runway threshold | 1 sec | critical | |
| Runway end (flight path alignment point) | 1 sec | Critical | |
| Runway holding point | 1 sec | Critical | |
| Taxiway centre line/parking guidance line points | 1/100 sec | Essential | |
| Taxiway intersection marking line | 1 sec | Essential | |
| Exit guidance line | 1 sec | Essential | |
| Aircraft stand points/INS checkpoints | 1/100 sec | Routine | |
| Geometric centre of TLOF or FATO threshold, heliport | 1 sec | critical | |
| Apron boundaries (polygon) | 1 sec | Routine | |
| De-icing/anti-icing facility (polygon) | 1 sec | routine | |
| Note: See Schedule 15 for graphical illustrations of obst. obstacles in the defined areas. | acle data collection surfaces a | and criteria used to identify | |

SCHEDULE 7

FRAMEWORK FOR SAFETY MANAGEMENT SYSTEMS (SMS)

[Schedule 1 – Part A, Clause 31(2)]

This schedule specifies the framework for the implementation and maintenance of a safety management system (SMS) by an air traffic services provider. An SMS is a management system for the management of safety by an organisation. The framework includes four (4) components and twelve (12) elements representing the minimum requirements for SMS implementation.

The implementation of the framework shall be commensurate with the size of the organisation and the complexity of the services provided. This schedule also includes a brief description of each element of the framework.

The following are the minimum standards for an Operator Safety Management System.

General

This specifies the framework for the implementation and maintenance of a safety management system (SMS) by an operator. An SMS is a management system for the management of safety by an organisation. The framework includes four (4) components and twelve (12) elements representing the minimum requirements for SMS implementation.

The implementation of the framework shall be commensurate with the size of the organisation and the complexity of the services provided. A brief description of each element of the framework is also included.

Contents

- 1. Safety policy and objectives:
 - (a) Management commitment and responsibility;
 - (b) Safety accountabilities;
 - (c) Appointment of key safety personnel;
 - (d) Coordination of emergency response planning; and
 - (e) SMS documentation.
- 2. Safety risk management:
 - (a) Hazard identification; and
 - (b) Safety risk assessment and mitigation.
- 3. Safety assurance:
 - (a) Safety performance monitoring and measurement;
 - (*b*) The management of change; and
 - (c) Continuous improvement of the SMS.
- 4. Safety promotion:
 - (a) Training and education; and
 - (b) Safety communication.

1. Safety Policy and Objectives

(a) Management commitment and responsibility:

The operator shall define the organisation's safety policy which shall be in accordance with international and national requirements, and which shall be signed by the accountable executive of the organisation. The safety policy shall reflect organisational commitments regarding safety; shall include a clear statement about the provision of the necessary resources for the implementation of the safety policy; and shall be communicated, with visible endorsement, throughout the organisation.

The safety policy shall include the safety reporting procedures; shall clearly indicate which types of operational behaviours are unacceptable; and shall include the conditions under which disciplinary action would not apply. The safety policy shall be periodically reviewed to ensure it remains relevant and appropriate to the organisation.

(b) Safety accountabilities:

The operator shall identify the accountable executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the operator, for the implementation and maintenance of the SMS. The operator shall also identify the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS.

Safety responsibilities, accountabilities and authorities shall be documented and communicated throughout the organisation, and shall include a definition of the levels of management with authority to make decisions regarding safety risk tolerability.

(c) Appointment of key safety personnel:

The operator shall identify a safety manager to be the responsible individual and focal point for the implementation and maintenance of an effective SMS.

(d) Coordination of emergency response planning:

The operator shall ensure that an emergency response plan that provides for the orderly and efficient transition from normal to emergency operations and the return to normal operations is properly coordinated with the emergency response plans of those organisations it must interface with during the provision of its services.

(e) SMS documentation:

The operator shall develop an SMS implementation plan, endorsed by senior management of the organisation that defines the organisation's approach to the management of safety in a manner that meets the organisation's safety objectives. The operator shall develop and maintain SMS documentation describing the safety policy and objectives, the SMS requirements, the SMS processes and procedures, the accountabilities, responsibilities and authorities for processes and procedures, and the SMS outputs.

Also as part of the SMS documentation, the operator shall develop and maintain a safety management system manual (SMSM), to communicate its approach to the management of safety throughout the organisation.

2. Safety Risk Management

(a) Hazard identification:

The operator shall develop and maintain a formal process that ensures that hazards in operations are identified. Hazard identification shall be based on a combination of reactive, proactive and predictive methods of safety data collection.

(b) Safety risk assessment and mitigation:

The operator shall develop and maintain a formal process that ensures analysis, assessment and control of the safety risks in training operations.

3. Safety Assurance

(a) Safety performance monitoring and measurement:

The operator shall develop and maintain the means to verify the safety performance of the organisation and to validate the effectiveness of safety risk controls. The safety performance of the organisation shall be verified in reference to the safety performance indicators and safety performance targets of the SMS.

(*b*) The management of change:

The operator shall develop and maintain a formal process to identify changes within the organisation which may affect established processes and services; to describe the arrangements to ensure safety performance before implementing changes; and to eliminate or modify safety risk controls that are no longer needed or effective due to changes in the operational environment.

(c) Continuous improvement of the SMS:

The operator shall develop and maintain a formal process to identify the causes of substandard performance of the SMS, determine the implications of substandard performance of the SMS in operation, and eliminate or mitigate such causes.

4. Safety Promotion

(*a*) Training and education:

The operator shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform the SMS duties. The scope of the safety training shall be appropriate to each individual's involvement in the SMS.

(*b*) Safety communication:

The operator shall develop and maintain formal means for safety communication that ensures that all personnel are fully aware of the SMS, conveys safety-critical information, and explains why particular safety actions are taken and why safety procedures are introduced or changed.

SCHEDULE 8

AERONAUTICAL INFORMATION SERVICES

(Regulation 36)

PART A

GENERAL

Responsibilities and Functions

The following are the standards required to be met by the Authority in providing Aeronautical Information Services:

1. (1) An aeronautical information service 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 ATM community, including:

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

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

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

(2) An aeronautical information service shall-

- (a) receive;
- (b) generate;
- (*c*) collate or assemble;
- (d) edit;
- (e) format;
- (f) publish/store; and
- (g) distribute aeronautical information and aeronautical data concerning the entire territory of Guyana as well as areas in which the Authority is responsible for the provision of air traffic services outside the territory of Guyana.

(3) All aeronautical information and aeronautical data shall be published as an Integrated Aeronautical Information Package.

Note. — An aeronautical information service may include origination functions.

(4) Where 24-hour service is not provided, service shall be available during the whole period an aircraft is in flight in the area of responsibility of an aeronautical information service, plus a period of at least two (2) hours before and after such a period. The service shall also be available at such other time as may be requested by an appropriate ground organisation.

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

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

(6) Aeronautical data and aeronautical information obtained under (5) (a) shall, when distributed, be clearly identified as having the authority of the State of Origin.

(7) Aeronautical data and aeronautical information obtained under (5) (b) shall, if possible, be verified before distribution and if not verified shall, when distributed, be clearly identified as such.

(8) An aeronautical information service shall promptly make available to the aeronautical information services of other States any aeronautical data and aeronautical information necessary for the safety, regularity or efficiency of air navigation required by them, to enable them to comply with (1).

Exchange of Aeronautical Information and Aeronautical Data

2. (1) The Authority shall designate the office to which all elements of the Integrated Aeronautical Information Package originated by other States shall be addressed.

(2) The office designated under sub-clause (1), shall be qualified to deal with requests for aeronautical information and aeronautical data originated by other States.

(3) Where the Authority designates more than one (1) international NOTAM offices, the Director General shall define the extent of responsibility and the territory covered by each office.

(4) The aeronautical information service shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.

(5) The aeronautical information service provider shall, wherever practicable, establish direct contact with other AIS in order to facilitate the international exchange of aeronautical information and aeronautical data.

(6) One (1) copy of each of the elements of the Integrated Aeronautical Information Package that has been requested by an AIS of another Contracting State shall be made available by the aeronautical information service provider in the mutually-agreed form(s), without charge, even where authority for publication, storage and distribution has been delegated to a commercial agency.

(7) The exchange of more than one (1) copy of the elements of the Integrated Aeronautical Information Package and other air navigation documents, including those containing air navigation legislation and regulations, shall be subject to bilateral agreement between ICAO Contracting States.

(8) 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 should be subject to separate agreement with the originating State.

Copyright

3. Note. — In order to protect the investment in the products of a State's AIS as well as to ensure better control of their use, States may wish to apply copyright to those products in accordance with their national laws.

Any AIS product of another Contracting State which has been granted copyright protection 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 protection of the originating State.

Aeronautical Information Management

4. (1) Information Management Requirements

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

(2) Aeronautical Data and Aeronautical Information Validation and Verification

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

Note 1. — Guidance material on the liaison with other related services is contained in Doc 8126.

Note 2.— Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, and traceability and protection requirements) may be found in the World Geodetic System — 1984 (WGS-84) Manual (Doc 9674). Supporting data quality material in respect of data accuracy, publication resolution, and integrity of aeronautical data, together with guidance material in respect to the rounding convention for aeronautical data, is contained in RTCA Document DO-201A and European Organisation for Civil Aviation Equipment (EUROCAE) Document ED-77 — Standards for Aeronautical Information (or equivalent).

Note 3. — Guidance material on the management of aeronautical data quality is included in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839).

(3) Data Quality Specifications

- i. Accuracy.
 - A. The order of accuracy for aeronautical data shall be as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three (3) 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 Schedule 15.
- ii. Resolution.
 - A. The order of publication resolution of aeronautical data shall be that as specified in Schedules 9 and 19
 - B. 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.

iii. Integrity.

- A. The integrity classification related to aeronautical data shall be as provided in Schedule 6.
- B. The integrity of aeronautical data shall be maintained throughout the data process from survey/origin to distribution to the next intended user (the entity that receives the aeronautical information from the aeronautical information service provider). Based on the applicable integrity classification, the validation and verification procedures shall:
 - I. for routine data: avoid corruption throughout the processing of the data;
 - II. for essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and
 - III. 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 European Organisation for Civil Aviation Equipment (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.

Metadata

5. (1) Metadata shall be collected for aeronautical data processes and exchange points.

(2) The metadata collection in sub-clause (1) shall be applied throughout the aeronautical information data chain, from survey and origin to distribution to the next user.

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

(3) The metadata to be collected shall include, as a minimum -

- (a) the name of the organisation or entity performing any action of originating, transmitting or manipulating the data;
- (*b*) the action performed; and
- (c) the date and time the action was performed.

Data Protection

6. (1) Aeronautical data and data sets shall be protected in accordance with data error detection, security, and authentication techniques.

Note. — *The* Aeronautical Information Services Manual (*Doc* 8126) *contains suitable guidance on data error detection, security, and authentication techniques.*

(2) Electronic aeronautical data sets shall be protected 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 section (3) above.

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

Note 2. — Guidance on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (*Doc 8126*).

Use of Automation

7. (1) Automation shall be introduced with the objective of improving the timeliness, quality, efficiency and cost effectiveness of aeronautical information services.

Note. — *Guidance on the development of databases and the establishment of data exchange services may be found in the* Aeronautical Information Services Manual (*Doc* 8126).

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

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

(4) The aeronautical information model used shall encompass the aeronautical data and aeronautical information to be exchanged.

(5) The aeronautical information model used 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 5 (3); and

- (*d*) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.
- (6) The aeronautical data exchange model used 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 sub clause (4) above; 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 standardisation.

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

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

Quality Management System

8. (1) Quality management systems shall be implemented and maintained encompassing all functions of an aeronautical information service. The execution of such quality management systems shall be made demonstrable for each function stage.

Note. — *Guidance material is contained in the* Manual on the Quality Management System for Aeronautical Information Services (*Doc* 9839).

(2) 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.

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

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

(3) The quality management system established in accordance with sub clause (1) shall follow the International Organisation for Standardisation (ISO) 9000 series of quality assurance standards, and be certified by an approved organisation.

Note 1. — An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.

Note 2.— International Organisation for Standardisation (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme and define the term "accredited certification body". The details of a successful programme are to be formulated by each State and in most cases are unique to the State organisation.

Note 3.— Supporting material in respect of the processing of aeronautical data is contained in RTCA Document DO-200A and European Organisation for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data. These standards support the development and application of aeronautical databases.

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

Note. — *Guidance material concerning training methodology to ensure the competency of personnel is contained in the* Aeronautical Information Management Training Development Manual (*Doc 9991*).

(5) Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data are traceable throughout the aeronautical information data 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 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 section 2 and 3 above and that the data traceability requirements are met through the provision of appropriate metadata as specified in section 5 above. The system shall also provide assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.
(7) All necessary measures shall be taken 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 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.

Human Factors Considerations

9. (1) The organisation of the aeronautical information services as well as the design, contents, processing and distribution of aeronautical data and aeronautical information shall take into consideration Human Factors principles which facilitate their optimum utilisation.

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

Note. — This may be accomplished through the design of systems, through operating procedures or through improvements in the operating environment.

General Specifications

10. (1) Each element of the Integrated Aeronautical Information Package for international distribution shall include English text for those parts expressed in plain language.

(2) The name of places shall be spelt in conformity with local usage and transliterated, where necessary, into the Latin alphabet.

11.ICAO abbreviations shall be used in the aeronautical information services where the abbreviations are appropriate and the use of those abbreviations will facilitate distribution of information and data.

12.(1) Each prohibited area, restricted area, or danger area established by the Authority shall, upon initial establishment, be given an identification and full details shall be promulgated under ENR 5.1 of the AIP.

(2) The identification assigned under sub-clause (3) shall-

- (*a*) be used to identify the area in all subsequent notifications pertaining to that area; and
- (*b*) be composed of a group of letters and figures as follows:

- (i) nationality letters for location indicators assigned to the State or territory which has established the airspace;
- (ii) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and
- (iii) a number, unduplicated within the State or territory concerned.

(3) Identification numbers shall not be reused for a period of at least one (1) year after cancellation of the area to which they refer.

13.(1) Human Factors Principles shall be taken into consideration in determining the organisation of the aeronautical information services as well as the design, contents, processing and distribution of aeronautical information and data to facilitate their optimum utilisation.

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

Common Reference Systems for Air Navigation

14. (1) Common reference system used for air navigation shall be as follows:

- (a) World Geodetic System 1984 shall be used as the horizontal geodetic reference system for international air navigation and published aeronautical geographical coordinates indicating latitude and longitude shall be expressed in terms of the WGS-84 geodetic reference datum;
- (b) geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in Part A of Schedule 1 and Chapter 2 of Volume 1 of Annex 14 of the Chicago Convention, shall be identified by an asterisk; and
- (c) the order of publication resolution of geographical coordinates shall be that specified in Table A-1 of Schedule 9 while the order of chart resolution of geographical coordinates shall be that specified in Table 1 of Schedule 22;

(2) Vertical reference system for air navigation shall be as follows:

- (a) MSL datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system for international air navigation;
- (b) The Earth Gravitational Mode—1996 (EGM—96), containing long wavelength gravity field data to degree and order 360, shall be used by international air navigation as the global gravity model;
- (c) Geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation specified in Volumes I and II of Annex 14, on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used;
- (*d*) where 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 AIP;
- (e) further 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 Schedule 10 shall also be published; and
- (*f*) the order of publication resolution of elevation and geoid undulation shall be that specified in Table A-2 of Schedule 9, while the order of chart resolution of elevation and geoid undulation shall be that specified in Table 3 of Schedule 22.
- (3) Temporal references for air navigation shall be as follows:
 - (*a*) for international civil aviation, the Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system; and
 - (b) 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, shall include either a description of that system or a citation for a document that describes that temporal reference system.

PART B

(Regulation 39)

AERONAUTICAL INFORMATION PUBLICATIONS (AIP)

The standards required to be met for AIP shall be as follows:

Contents

1. (1) an AIP shall contain, in three (3) parts, sections and subsections uniformly referenced to allow for standardised electronic data storage and retrieval, current information relating to, and arranged under those subjects enumerated in Schedule 10.

(2) Notwithstanding sub-clause (1), 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 Director General provided that an adequate table of contents is included.

(3) An AIP shall include in Part 1–General (GEN) the following:

- (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 regulations and practices of Guyana and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to readily differentiate between the requirements of the Authority and the related ICAO provisions; and
- (*d*) The choice made by the Director General in each significant case where an alternative course of action is provided for in ICAO Standards, Recommended Practices and Procedures.

(4) The following aeronautical charts shall, where available for designated international ICAO aerodromes and heliports, form part of the AIP, or be distributed separately to recipients of the AIP:

- (a) Aerodrome and Heliport Chart–ICAO;
- (b) Aerodrome Ground Movement Chart–ICAO;
- (c) Aerodrome Obstacle Chart (Type A)–ICAO;
- (d) Aerodrome Terrain and Obstacle Chart ICAO (Electronic);
- (e) Aircraft Parking and 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; and
- (l) Visual Approach Chart-ICAO

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

General Specifications

2. (1) An AIP shall -

- (a) be self-contained and include a table of contents; and
- (*b*) not duplicate information within the AIP or from other sources.

(2) Where the Authority and another State combine to issue a joint AIP, this information shall be made clear on the cover and in the table of contents.

(3) All AIP shall be dated.

(4) Where an AIP is issued in loose-leaf form, each page shall contain the day, month and year, of the publication date or the effective date of the information. (5) A checklist giving the current date of each page in the AIP series shall be reissued frequently to assist the user in maintaining a current publication.

(6) The page number, chart title and date of the checklist under subclause (4), shall appear on the checklist itself.

(7) An AIP issued as a bound volume and each page of an AIP issued in loose-leaf form shall be so annotated as to indicate clearly—

- (*a*) the identity of the AIP;
- (b) the territory covered and subdivisions when necessary;
- (c) the identification of the issuing State and the authority;
- (*d*) page numbers and chart titles; and
- (*e*) the degree of reliability where the information is doubtful.

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

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

(10) AIP shall be amended or reissued at such regular intervals as may be necessary to keep the AIP up-to-date.

(11) Recourse to hand amendments or annotations shall be kept to the minimum.

(12) The normal method of amendment shall be by means of a replacement sheet.

(13) The regular interval referred to in sub-clause (10) shall be specified in the AIP,

Specifications for AIP Amendments

3. (1) Permanent changes to the AIP shall be published as AIP amendments.

(2) Each AIP amendment shall be allocated a consecutive serial number.

(3) Each AIP Amendment page, including the cover sheet, shall display a publication date.

(4) Each AIRAC AIP amendment page, including the cover sheet, shall display the date when the amendment becomes effective.

(5) Where an effective time other than 0000UTC is used, the effective time shall also be displayed on the cover sheet.

(6) When an AIP amendment is issued, the AIP amendment shall include references to the serial number of those elements, if any, of the Integrated Aeronautical Information Package which has been incorporated into the amendment.

(7) A brief indication of the subjects affected by the amendment shall be stated on the AIP amendment cover sheet.

(8) 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 in sub-clause 2(14) of Part C of this Schedule.

Specifications for AIP Supplements

4. (1) Temporary changes of duration three (3) months or longer and information of short duration which contains extensive text or graphics shall be published as AIP Supplements.

(2) Each AIP supplement shall be allocated consecutive serial numbers based on the calendar year.

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

(4) Where an AIP supplement is sent in replacement of a NOTAM, the AIP supplement shall include a reference to the serial number of the NOTAM.

(5) A checklist of valid AIP supplements shall be issued through the medium of the monthly printed plain-language list of valid NOTAM required in sub-clause 2(14) of Part C of this Schedule.

(6) Where 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.

Distribution

5. AIP amendments and AIP supplements shall be made available by the Authority by the most expeditious means.

Electronic AIP (eAIP)

6. (1) Where provided, the information content of the electronic AIP and the structure of the chapters, sections and sub-sections shall follow the content and structure of the paper AIP.

(2) The electronic AIP shall include files that allow for printing a paper AIP.

PART C

(Regulation 40)

NOTAM

The Standards required to be met for NOTAM shall be as follows:

Origination

1. (1) A NOTAM shall be originated and issued promptly where -

- (*a*) the information to be distributed is of a temporary nature and of short duration; or
- (*b*) operationally significant permanent changes, or temporary changes of long duration are made at short notice, except for extensive text and/or graphics.

(2) A NOTAM shall be originated and issued in respect of the following:

- (*a*) establishment, closure or significant changes in operation of aerodrome and heliport or runways;
- (*b*) establishment, withdrawal and significant changes in operation of aeronautical services such as AGA, AIS, ATS, CNS, MET and SAR;
- (c) establishment, withdrawal and significant changes in operational capability of radio navigation and air-ground communication services which includes—
 - (i) interruption or return to operation;
 - (ii) change of frequencies;
 - (iii) change in notified hours of service;
 - (iv) change of identification;
 - (v) change of orientation such as directional aids;
 - (vi) change of location;
 - (vii) power increase or decrease amounting to fifty percent (50 %) or more;
 - (viii) change in broadcast schedules or contents; or
 - (ix) 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 regulations requiring immediate action, such as 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 and 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 of the areas or routes where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;
- (*p*) allocation, cancellation or change of location indicators;
- (q) significant changes in the level of protection normally available at an aerodrome or a heliport for rescue and firefighting purposes;
- (*r*) presence or removal of, or significant changes in, hazardous conditions due to radioactive material, toxic chemicals, volcanic ash deposition 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 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 portion of routes 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 the 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.
- (3) The following information shall not be notified by NOTAM:
 - (*a*) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
 - (*b*) runway marking work, where aircraft operations can safely be conducted on other available runways, or the equipment used can be removed where necessary;
 - (*c*) temporary obstructions in the vicinity of aerodrome and heliport that do not affect the safe operation of aircraft;
 - (*d*) partial failure of aerodrome and heliport lighting facilities where the partial failure does not directly affect aircraft operations;
 - (e) partial temporary failure of air-ground communications where 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 where in uncontrolled airspace under VFR, when controlled, at promulgated sites or within danger or prohibited areas; and

(*i*) other information of a similar temporary nature.

(4) At least seven (7) days' advance notice shall be given of the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions other than for emergency operations.

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

(6) Where 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 time and the reference number of the amendment or supplement.

(7) The NOTAM under sub-clause (5) shall come into force on the effective date and time as the amendment or supplement became effective and remains valid in the pre-flight information bulletin for a period of fourteen (14) days.

General Specifications

2. (1) Except as otherwise provided in sub-clauses (3) and (4), each NOTAM shall contain the information in the order shown in the NOTAM Format in Schedule 13.

(2) Text of NOTAM shall be composed of the significations and 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 is 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 or volcanic ash cloud when reported by means of an ASHTAM, shall contain the information in the order shown in the ASHTAM Format in Schedule 11.

(5) The NOTAM originator shall allocate to each NOTAM a series identified by a letter and a consecutive four-digit number based on the calendar year followed by a stroke and a two-digit number for the year.

(6) Where errors occur in a NOTAM, a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued.

(7) Where a NOTAM is issued which cancels or replaces a previous NOTAM, the series and number of the previous NOTAM shall be indicated so the series, location indicator and subject of both NOTAM are the same and only one (1) NOTAM is cancelled or replaced by another NOTAM.

(8) Each NOTAM shall –

- (*a*) deal with only one (1) subject and one (1) condition of the subject;
- (*b*) be as brief as possible and compiled so that the meaning of the NOTAM is clear without the need to refer to another document; and
- (*c*) be transmitted as a single telecommunication message.

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

(10) A complete form of Location indicators shall be included in the text of a NOTAM contained in the Location Indicators specified in the ICAO Doc. 7910.

(11) In no case shall an abbreviated form of a location indicator under sub-clause (10) be used.

(12) Where no ICAO location indicator is assigned to the location, the name of the location spelt in accordance with Schedule 8, Part A (10) (2), shall be entered in plain language.

(13) A checklist of valid NOTAM for each series shall-

- (*a*) be issued as a NOTAM over the AFS at intervals of not more than one (1) month using the NOTAM format specified in Schedule 13, one (1) NOTAM issued for each series.
- (*b*) refer to the latest AIP Amendments, AIP Supplements and at least the internationally distributed AIC; and
- (*c*) have the same distribution as the actual message series to which they refer and be clearly identified as checklist.

(14) A monthly printed plain-language list of valid NOTAM, including indications of the latest AIP amendments, AIC issued and a checklist of AIP supplements shall be prepared with a minimum of delay and forwarded by the most expeditious means to recipients of the Integrated Aero-nautical Information Package.

Distribution

3. (1) NOTAM shall –

- (*a*) be distributed on the basis of a request;
- (*b*) be prepared in conformity with the relevant provisions of the ICAO communication procedures.
- (2) AFS shall, where practicable, be employed for NOTAM distribution.

(3) Where a NOTAM exchange as specified in sub-clause (5) is sent by means other than the AFS, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator shall be used, preceding the text.

(4) The Director General shall select the NOTAM that are to be given international distribution.

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

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

(7) The 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 inter-national and domestic flights

(8) A predetermined distribution system for NOTAM transmitted on the AFS in accordance with Schedule 12 shall be used where possible, subject to the requirements of sub-clause (5).

PART D

(Regulation 41)

AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)

The standards required to be met for AIRAC shall be as follows:

General Specifications

1. (1) Information concerning the circumstances listed in Part 1 of Schedule 14, shall be distributed under AIRAC, basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of twenty-eight (28) days, including 14th January 2010.

(2) Information notified in the AIRAC shall not be changed further for at least another twenty-eight (28) days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

(3) Where 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 (1) cycle before the AIRAC effective date concerned.

(4) Implementation dates other than the AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work or for updating of navigation databases.

Provision of Information in Paper Copy Form

2. In all circumstances, information provided under the AIRAC sys-tem shall be published in paper copy form and distributed by the AIS unit at least forty-two (42) days in advance of the effective date with the objective of reaching recipients at least twenty-eight (28) days in advance of the effective date.

Provision of Information in Electronic Form

3. (1) Where the Authority has established an aeronautical database in and thereafter updates the contents of that database concerning the

circumstances listed in Part 1 of Schedule 14, the Authority shall ensure that the effective dates of the data coincide with the established AIRAC effective dates used for the provision of information in paper copy form.

(2) The information provided in electronic form, concerning the circumstances listed in Part 1 of Schedule 14, shall be distributed and made available by the AIS unit so as to reach recipients at least twenty-eight (28) days in advance of the AIRAC effective date.

PART E

(Regulation 42)

AERONAUTICAL INFORMATION CIRCULARS

The standards required to be met for AIC shall be as follows:

Origination

1. (1) Whenever it is necessary to publish aeronautical information which does not qualify —

- (*a*) under the specifications in clause 1 of Part B for inclusion in an AIP; or
- (*b*) under the specifications in clause 1 of Part C for the origination of a NOTAM, an AIC shall be originated.

(2) Whenever it is desirable to publish –

- (*a*) a long-term forecast of any major change in legislation, regulations, procedures or facilities;
- (*b*) information of a purely explanatory or advisory nature liable to affect flight safety;
- (c) information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters such as —
 - forecasts of important changes in the air navigation procedures, services and facilities provided;

- (ii) forecasts of implementation of new navigational systems;
- (iii) significant information arising from aircraft accident or incident investigation which has a bearing on flight safety;
- (iv) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;
- (v) advice on medical matters of special interest to pilots;
- (vi) warnings to pilots concerning the avoidance of physical hazards;
- (vii) effect of certain weather phenomena on aircraft operations;
- (viii) information on new hazards affecting aircraft handling techniques;
- (ix) regulations relating to the carriage of restricted articles by air;
- (x) reference to the requirements of, and publication of changes in, national legislation;
- (xi) aircrew licensing arrangements;
- (xii) training of aviation personnel;
- (xiii) application of, or exemption from, requirements in national legislation;
- (xiv) advice on the use and maintenance of specific types of equipment;
- (xv) actual or planned availability of new or revised editions of aeronautical charts;
- (xvi) carriage of communication equipment;
- (xvii) explanatory information relating to noise abatement;

- (xviii) selected airworthiness directives
- (xix) changes in NOTAM series or distribution, new editions of AIP or major changes in their con-tents, coverage or format; and
- (xx) other information of a similar nature, an AIC shall be originated.

Note: The publication of an AIC does not remove the obligation set out in Part B and Part C.

General Specifications

2. (1) The aeronautical information service Guyana shall select the AIC that are to be given international distribution.

(2) An AIC shall be issued in printed form.

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

(4) Where AIC are distributed in more than one (1) series, each series shall be separately identified by a letter.

(5) A checklist of AIC currently in force shall be issued at least once a year, and distributed to the recipients of AIC.

Distribution

3. The aeronautical information service Guyana shall give AIC selected for international distribution the same distribution as for the AIP.

PART F

(Regulation 43)

PRE-FLIGHT AND POST-FLIGHT INFORMATION AND DATA

The standards required to be met for pre-flight and post-flight information and data are as follows:

Pre-Flight Information

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

(2) Aeronautical information provided for pre-flight planning purposes at the aerodrome or heliport referred to in regulation, shall include relevant –

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

(3) Additional current information relating to the aerodrome of departure shall be provided concerning the following where applicable:

- (*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 unmarked such as 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 aero-mobile 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 or limitations applied thereof.

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

Note: Guidance on the preparation of PIB is contained in ICAO Doc 8126.

Automated Aeronautical Information Systems

2. (1) The Authority shall use automated pre-flight information systems to make aeronautical information and data available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes.

(2) The information and data made available shall comply with the provisions Clause 1.

(3) Self-briefing facilities of an automated pre-flight information system shall provide access to operations personnel, including flight crew members and other aeronautical personnel concerned, for consultation as necessary with the aeronautical information service by telephone or other suitable telecommunications means.

(4) The human-to-machine interface of such facilities shall ensure easy access in a guided manner to all relevant information and data.

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

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

Post-Flight Information

3. (1) The Authority shall ensure that arrangements are made to receive at aerodromes and heliports information concerning –

- (a) the state and operation of air navigation facilities or services noted by aircrews and shall ensure that such information is made available to the aeronautical information service for distribution as the circumstances necessitate; and
- (*b*) the presence of birds observed by aircrews and shall ensure that such information is made available to the aeronautical

information service for such distribution as the circumstances necessitate.

PART G

(Regulation 44)

TELECOMMUNICATION REQUIREMENTS

The standards required to be met for Telecommunications requirements are as follows:

- (a) International NOTAM offices shall be connected to the AFS;
- (b) the connections provide for printed communications; and
- (*c*) each international NOTAM office shall be connected, through the AFS, to the following points within Guyana for which NOTAM office provides service:
 - (i) area control centres and flight information centres; and
 - (ii) aerodromes and heliports at which an information service is established in accordance with Part F.

PART H

(Regulation 45)

ELECTRONIC TERRAIN AND OBSTACLE DATA

The standards required to be met for electronic terrain and obstacle data are as follows:

Coverage Areas and Requirements for Data Provision

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

- (*a*) Area 1: the entire territory of a State;
- (*b*) Area 2: within the vicinity of an aerodrome, subdivided as follows:
 - (i) Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists;
 - (ii) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of ten kilometres (10 km) and a splay of fifteen percent (15%) to each side;
 - (iii) Area 2c: an area extending outside Area 2a and Area2b at a distance of not more than ten kilometres (10 km) from the boundary of Area 2a; and
 - (iv) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of forty-five kilometres (45 km) from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest;
- (c) Area 3: the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to ninety metres (90 m) from the runway centre line and fifty metres (50 m) from the edge of all other parts of the aerodrome movement area; and
- (*d*) Area 4: The area extending nine hundred metres (900 m) prior to the runway threshold and sixty metres (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.

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

(3) From 12 November 2015, 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) From 12 November 2015, 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 terrain and obstacle data shall be provided for:

- (a) Area 2a, for those obstacles that penetrate the relevant obstacle data collection surface specified in Schedule 15;
- (b) penetrations of the take-off flight path area obstacle identification surfaces; and
- (c) penetrations of the aerodrome obstacle limitation surfaces.

(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 Schedule 15, 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.

Terrain Data Set – Content, Numerical Specification and Structure

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

(2) A terrain grid under sub-clause (1), shall be angular or linear and of regular or irregular shape.

(3) Sets of electronic terrain data shall include spatial or represented by position and elevation, thematic and temporal aspects for the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, and excluding obstacles.

Note: In practical terms depending on the acquisition method used, sets of electronic data when put together would represent a continuous surface that exists at the bare earth, the top of the canopy or something in between, also known as "first reflective surface".

(4) In terrain data sets, only one (1) feature type such as terrain shall be provided.

(5) The terrain feature attributes listed in Table 3 of Schedule 15 represent the minimum set of terrain attributes and those annotated as mandatory shall be recorded in the terrain data set.

(6) Electronic terrain data for each area shall conform to the applicable numerical requirements of Table 1 of Schedule 15."

Obstacle Data Set – Content, Numerical Specification and Structure

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

(2) Obstacles shall not be included in terrain data sets.

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

(4) 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 Table 4 of Schedule 15.

(5) Electronic obstacle data for each area shall conform to the applicable numerical requirements in Table 2 of Schedule 15.

Terrain and Obstacle Data Product Specifications

4. (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 the products fulfil the requirements for the intended 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) An overview of terrain data product specification or obstacle data product specification shall provide an informal description of the product and contain general information about the data product.

Note: Specification of terrain data may not be homogenous across the whole data product but may vary for different parts of the data sets and a specification scope shall be identified.

(5) Where specification of terrain data is not homogenous across the whole data product, for each subject the specification scope shall be identified.

(6) Identification information concerning both terrain and obstacle data products shall—

- (*a*) include the title of the product;
- (*b*) a brief narrative summary of the content purpose, and spatial resolution if appropriate;
- (c) the geographic area covered by the data product; and
- (*d*) supplemental information.

(7) Content information of feature-based terrain data sets or of featurebased obstacle data sets shall each be described in terms of an application schema and a feature catalogue.

(8) Application schema shall provide a formal description of the data structure and content of data sets.

(9) Feature catalogue shall provide the semantics of all feature types and their attributes and attribute value domains, association types between feature types and feature operations, inheritance relations and constraints.

(10) Both terrain and obstacle data product specifications shall identify clearly the coverage and imagery they include and shall provide a narrative description of each of them.

Note: Coverage is considered a subtype of a feature and can be derived from a collection of features that have common attributes.

(11) Both terrain data product specifications and obstacle data product specifications shall include—

(*a*) information that identifies the reference system used in the data product;

- (b) the spatial reference system and temporal reference system;
- (c) the data quality requirements for each data product;
- (*d*) a statement on acceptable conformance quality levels and corresponding data quality measures that 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.

(12) Terrain data product specifications shall include a data capture statement that is a general description of the sources and of processes applied for the capture of terrain data.

(13) 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.

Note: 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.

(14) Terrain data product specifications shall contain information on how data held with data sets is presented, such as a graphic output, as a plot or as an image.

(15) The product specifications for both terrain and obstacles data shall also contain data product delivery information which shall include delivery formats and delivery medium information.

(16) The core terrain and obstacle metadata elements shall be included in the data product specifications.

(17) Any additional metadata items required to be supplied shall be stated in each product specification together with the format and encoding of the metadata.

(18) 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 of figure 2 in Schedule 15;
- (*b*) the take-off flight path area; and
- (*c*) the obstacle limitation surfaces.

SCHEDULE 9

DATA QUALITY SPECIFICATIONS

Table A-1 Latitude and Longitude

[Schedule 8, Part A - Clause 4 (3)]

| Latitude and Longitude | Publication Resolution | Integrity classification |
|--|------------------------|--------------------------|
| Flight information region boundary points | 1 min | routine |
| P, R, D area boundary points (outside CTA/CTR boundaries) | 1 min | routine |
| P, R, D area boundary points (inside CTA/CTR boundaries) | 1 sec | essential |
| CTA/CTR boundary points | 1 sec | essential |
| En route navaids, intersections and waypoints, and holding STAR/SID points | 1 sec | essential |
| Obstacles in Area 1 (the entire State territory) | 1 sec | routine |
| Aerodrome/heliport reference point | 1 sec | routine |
| NAVAIDS located at aerodrome/heliport | 1/10 sec | essential |
| Obstacles in Area 3 | 1/10 sec | essential |
| Obstacle in Area 2 | 1/10 sec | essential |
| Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure | 1/10 sec | essential |
| Runway threshold | 1/100 sec | critical |
| Runway end | 1/100 sec | critical |
| Runway holding point | 1/100 sec | critical |
| Taxiway centre line/parking guidance line points | 1/100 sec | essential |
| Taxiway intersection marking line | 1/100 sec | essential |
| Exit guidance line | 1/100 sec | essential |
| Aircraft stand points/INS checkpoints | 1/100 sec | routine |

| Geometric centre of TLOF or FATO threshold, heliport | 1/100 sec | critical |
|--|-----------|----------|
| Apron boundaries (polygon) | 1/10 sec | routine |
| De-icing/anti-icing facility (polygon) | 1/10 sec | routine |

Table A-2 Elevation/Altitude/Height

position

approaches

approaches

(DME)

[Schedule 8, Part A]

critical

essential

essential

routine

essential

essential

Elevation/Altitude/Height **Publication Resolution** Integrity classification 1 m or 1 ft Aerodrome/heliport elevation essential WGS-84 geoid undulation at 1 m or 1 ft essential aerodrome/heliport elevation 1 m or 1 ft essential GBAS reference point Heliport crossing height, PinS 1 m or 1 ft essential Runway or FATO threshold, non-1 m or 1 ft essential precision approaches WGS-84 geoid undulation at 1 m or 1 ft essential runway or FATO threshold, TLOF geometric centre, non-precision Runway or FATO threshold, 0.1 m or 0.1 ft critical precision approaches WGS-84 geoid undulation at 0.1 m or 0.1 ft critical

| runway or FATO threshold, TLOF geometric | | |
|--|-----------------|--|
| centre, precision approaches Threshold crossing height, precision approaches | 0.1 m or 0.1 ft | |
| Obstacles in Area 2 | 1 m or 1 ft | |
| Obstacles in Area 3 | 0.1 m or 0.1 ft | |
| Obstacles in Area 1 (the entire State territory) | 1 m or 1 ft | |
| Distance measuring equipment/precision (DME/P) | 3 m (10 ft) | |
| Distance measuring equipment | 30 m (100 ft) | |

Minimum altitudes

50 m or 100 ft

routine

See Schedule 15 for graphical illustration of obstacle data collection surfaces and criteria used to identify obstacles in defined areas

Table A-3Declination and Magnetic Variation

[Schedule 8, Part A]

| Declination/Variation | Accuracy data type | Integrity classification |
|--|--------------------|--------------------------|
| VHF NAV AID station declination used for technical line-up | 1 degree | essential |
| NDB NAV AID magnetic variation | 1 degree | routine |
| Aerodrome/heliport magnetic variation | 1 degree | essential |
| ILS localiser antenna magnetic variation | 1 degree | essential |
| MLS azimuth antenna magnetic variation | 1 degree | essential |

Table A-4 Bearing

[Schedule 8, Part A]

| Bearing | Accuracy data type | Integrity classification |
|-----------------------|--------------------|--------------------------|
| Airways segment | 1 degree | routine |
| En route and terminal | 1/10 degree | routine |
| fix information | | |
| Terminal | 1 degree | routine |
| arrival/departure | | |
| route segment | | |
| Instrument approach | 1/100 degree | essential |
| procedure fix | - | |
| formations | | |
| ILS localiser | 1/100 degree | essential |
| alignment (True) | | |
| MLS zero azimuth | 1/100 degree | essential |
| alignment (True) | Ū. | |
| Runway and FATO | 1/100 degree | routine |
| bearing (True) | U | |

SCHEDULE 10

CONTENTS OF THE AIP

(Schedule 8, Part B)

CONTENTS OF AERONAUTICAL INFORMATION PUBLICATION (AIP)

Note: This Schedule provides for structure in which an AIP is to be formatted

PART 1 - GENERAL (GEN)

Where an AIP is produced and made available in more than one (1) volume with each having a separate amendment and supplement service, a separate preface, record of AIP amendments, record of AIP supplements, checklist of AIP pages and list of current hand amendments must be included in each volume.

GEN 0.1-Preface

Brief description of the AIP, including the-

- (*a*) name of the publishing authority;
- (*b*) applicable ICAO documents;
- (c) AIP structure and established regular amendment interval; and
- (*d*) service to contact in case of detected AIP errors or omissions.

GEN 0.2-Record of AIP Amendments

A record of AIP amendments and AIRAC AIP amendments published in accordance with the AIRAC system containing the –

- (a) amendment number;.
- (*b*) publication date;
- (c) date inserted for AIP amendments and effective date for AIRAC AIP amendments; and

(*d*) initials of officer who inserted the amendment.

GEN 0.3-Record of AIP Supplements

A record of issued AIP Supplements containing the-

- (*a*) supplement number;
- (*b*) supplement subject;
- (c) AIP section affected;
- (*d*) period of validity; and
- (e) cancellation record.

GEN 0.4-Checklist of AIP Pages

A checklist of AIP pages containing the -

- (a) page number and chart title; and
- (*b*) publication or effective date of the aeronautical information expressed as day, month by name and year.

GEN 0.5-List of hand amendments to the AIP

A list of current hand amendments to the AIP containing the -

- (*a*) AIP page affected;
- (b) amendment text; and
- (c) AIP amendment number by which a hand amendment was introduced.

GEN 0.6-Table of Contents to Part 1

A list of all sections and subsections of the subjects enumerated in Part 1 – General (GEN).

GEN 1.—NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 – Designated authorities

The addresses of authorities designated by the Government of Guyana concerned with the facilitation of international air navigation such as civil aviation, meteorology, customs, immigration, health, *en route* and aerodrome/heliport charges, agricultural quarantine and aircraft accident investigation and containing, for each authority the —

- (a) designated authority;
- (*b*) name of the authority;
- (c) postal address;
- (*d*) telephone number;
- (e) telefax number;
- (*f*) e-mail address;
- (g) AFS address; and
- (*h*) website address, where available. requisite

GEN 1.2-Entry, transit and departure of aircraft

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

GEN 1.3—Entry, transit and departure of passengers and crew

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

GEN 1.4—Entry, transit and departure of cargo

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

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

GEN 1.5-Aircraft instruments, equipment and flight documents

(1) A brief description of aircraft instruments, equipment and flight documents, including the aircraft communication, navigation and surveillance equipment to be carried on aircraft and any special requirement in addition to the requirements specified in the *Civil Aviation (Instrument and Equipment) Regulations.*

(2) emergency locator transmitter (ELT), signaling devices and life-saving equipment as presented in Annex 6, Part I, 6.6 and Part II, 2.4.5, where so determined by regional air navigation meetings, for flights over designated land areas.

GEN 1.6-Summary of national regulations and international agreements and conventions

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

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

A list of significant differences between any written law and practices in Guyana and related ICAO provisions must be listed under this subsection, including the:

- (a) provision affected (Annex and edition number, paragraph);
- (*b*) difference in full text.;
- (c) all Annexes in numerical order even if there is no difference to an Annex, in which case a NIL notification shall be provided; and
- (*d*) the degree of non-application of the regional supplementary procedures that shall be notified immediately following the Annex to which the supplementary procedure relates.

GEN 2.—TABLES AND CODES

GEN 2.1-Measuring system, aircraft markings and holidays

GEN 2.1.1 – Units of Measurement

A description of units of measurement used including table of units of measurement.

GEN 2.1.2 – Temporal Reference System

A description of the temporal reference system employed, together with an indication of whether or not daylight saving hours are employed and how the temporal reference system is presented throughout the AIP.

GEN 2.1.3 – Horizontal Reference System

A brief description of the horizontal reference system used, including:

- (a) the name and designation of the reference system;
- *(b)* the identification of the projection;
- (c) the identification of the ellipsoid used;
- (*d*) the identification of the datum used;
- (e) the area of application; and
- (*f*) an explanation, where applicable, of the asterisk used to identify those coordinates that do not meet the accuracy requirements of Schedule 1 and Annex 14.

GEN 2.1.4-Vertical Reference System

A brief description of the vertical reference system used, including the:

- (a) name and designation of the reference system;
- (*b*) description of the geoid model used including the parameters required for height transformation between the model used and EGM-96; and
- (c) an explanation, where applicable, of the asterisk used to identify those elevations and geoid undulations that do not meet the accuracy requirements of Annex 14.
An indication of aircraft nationality and registration as specified in the *Civil Aviation (Registration and Markings) Regulations.*

GEN 2.1.6 – Public holidays

A list of public holidays indicating the services being affected.

GEN 2.2—Abbreviations used in AIS publications

A list of alphabetically arranged abbreviations and their respective significations used by the Authority in its AIP and in the distribution of aeronautical information and data with appropriate annotation for those national abbreviations that are different from those contained in the ICAO Procedures for Air Navigation Services Doc 8400.

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Note: A list of alphabetically arranged definitions or glossary of terms may also be added.
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GEN 2.3 – Chart Symbols

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

GEN~2.4-Location~Indicators

A list of alphabetically arranged location indicators assigned to the locations of AFS to be used for encoding and decoding purposes with an annotation to locations not connected to the AFS where applicable.

GEN 2.5-List of Radio Navigation Aids

A list of radio navigation aids arranged alphabetically, containing:

- (*a*) the identifier;
- (*b*) the name of the station;
- (c) the type of facility or aid; and
- (*d*) the indication whether the aid serves *en route*, aerodrome or dual purposes represented by the letters EA and AE respectively.

GEN 2.6 - Conversion Tables

Tables for conversion between:

- (a) nautical miles (NM) and kilometres (km) and vice versa;
- (b) feet (ft) and metres (m) and vice versa;
- (c) decimal minutes of arc and seconds of arc and vice versa; and
- (*d*) other conversion tables, as appropriate.

GEN 2.7-Sunrise and Sunset Tables

A brief description of criteria used for determination of the times given in the sunrise and sunset tables, together with an alphabetical list of locations for which the times are given with a reference to the related page in the table and the sunrise and sunset tables for the selected stations or locations, including the:

- (*a*) station name;
- (b) ICAO location indicator;
- (c) geographical coordinates in degrees and minutes;
- (*d*) date for which times are given;
- (e) time for the beginning of morning civil twilight;
- (*f*) time for sunrise;
- (g) time for sunset; and
- (*h*) time for the end of evening civil twilight.

GEN 3-SERVICES

GEN 3.1-Aeronautical Information Services

GEN 3.1.1-Responsible Service

A description of the AIS provided and its major components, including-

- (*a*) the service and unit name;
- (*b*) the postal address;
- (c) the telephone number;
- (*d*) the telefax number;

- (e) e-mail address;
- (f) the AFS address;
- (*g*) website address, where available;
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (*i*) an indication if service is not H24.

GEN 3.1.2 – Area of Responsibility

The area of responsibility for the aeronautical information service.

GEN 3.1.3 – Aeronautical Publications

A description of the elements of the Integrated Aeronautical Information Package, including:

- (a) AIP and related amendment service;
- (b) AIP Supplements;
- (c) AIC including whether used to publish publication prices;
- (*d*) NOTAM and PIB;
- (e) checklists and lists of valid NOTAM; and
- (f) how each element may be obtained.

GEN 3.1.4-AIRAC System

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

GEN 3.1.5 Pre-flight Information Service at Aerodromes and Heliports

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

(a) elements of the Integrated Aeronautical Information Packages held;

- (b) maps and charts held; and
- (c) general area of coverage of such data.

GEN 3.1.6 – Electronic Terrain and Obstacle Data

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

- (*a*) name of the individual, service or organisation responsible;
- (*b*) street address and e-mail address of the individual, service or organisation responsible;
- (c) telefax number of the individual, service or organisation responsible;
- (*d*) telephone number of the individual, service or organisation responsible;
- *(e)* hours of service represented in time period including time zone when contact can be made;
- (*f*) online information that can be used to contact the individual, service or organisation; and
- (g) supplemental information, where necessary, on how and when to contact the individual, service or organisation.

GEN 3.2-Aeronautical Charts

GEN 3.2.1—Responsible Service

A description of service responsible for the production of aeronautical charts, including –

- (*a*) the service name;
- (*b*) the postal address;
- (c) the telephone number;
- (*d*) the telefax number;

- (e) e-mail address;
- (*f*) the AFS address;
- (*g*) website address, where available;
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (*i*) an indication if service is not H24.

GEN 3.2.2 – Maintenance of charts

A brief description of how aeronautical charts are revised and amended.

GEN 3.2.3 – Purchase arrangements

Details of how charts may be obtained containing the -

- (*a*) service and sales agency;
- (b) postal address;
- (c) telephone number;
- (*d*) telefax number;
- (e) e-mail address;
- (f) AFS address; and
- (*g*) website address, where available;

GEN 3.2.4 – Aeronautical chart series available

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

GEN 3.2.5 – List of aeronautical charts available

A list of aeronautical charts available, including the-

- (*a*) title of series;
- (*b*) scale of series;

- (c) name and number of each chart or each sheet in a series;
- (*d*) price per sheet; and
- (e) date of latest revision.

GEN 3.2.6 – Index to the WAC-ICAO 1:1000 000

An index chart showing coverage and sheet layout for the WAC 1:1000 000 produced by the Authority where Aeronautical Chart–ICAO 1:500 000 is produced instead of WAC 1:1000 000, index charts must be used to indicate coverage and sheet layout for the Aeronautical Chart–ICAO 1:500 000.

GEN 3.2.7 – Topographical charts

Details of how topographical charts may be obtained, containing the -

- (*a*) name of service and agency;
- (*b*) postal address;
- (c) telephone number;
- (*d*) telefax number;
- (e) e-mail address;
- (f) AFS address; and
- (*g*) website address, where available;

GEN 3.2.8 – Corrections to charts not contained in the AIP

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

GEN 3.3-Air Traffic Services

GEN 3.3.1-Responsible service

A description of the ATS and its major components, including -

- (*a*) the service name;
- (b) the postal address;

- (*c*) the telephone number;
- (*d*) the telefax number;
- (e) e-mail address;
- (f) the AFS address;
- (g) website address, where available;
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (*i*) an indication if service is not H24.

GEN 3.3.2 – Area of Responsibility

A brief description of area of responsibility for which ATS are pro-vided.

GEN 3.3.3-Types of services

A brief description of main types of ATS provided.

GEN 3.3.4 – Coordination between an operator and ATS

General conditions under which coordination between an operator and ATS is affected.

GEN 3.3.5-Minimum flight altitude

The criteria used to determine minimum flight altitudes.

GEN 3.3.6 – ATS units address list

A list of ATS units and the units addresses arranged alphabetically, containing the -

- (a) unit name;
- (b) postal address;
- (c) telephone number;
- (*d*) telefax number;
- (e) e-mail address;

- (f) AFS address; and
- (*g*) website address, where available;

GEN 3.4-Communication Services

GEN 3.4.1-Responsible service

A description of the service responsible for the provision of telecommunication and navigation facilities, including –

- (*a*) the service name;
- (*b*) the postal address;
- (*c*) the telephone number;
- (*d*) the telefax number;
- (e) e-mail address;
- (f) the AFS address;
- (*g*) website address, where available;
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (*i*) an indication if service is not H24.

GEN 3.4.2 – Area of responsibility

A brief description of area of responsibility for which telecommunication service is provided.

GEN 3.4.3 – Types of service

A brief description of the main types of service and facilities provided, including—

- (*a*) the radio navigation services;
- (b) voice or data link services;
- (c) the broadcasting service;

- (*d*) the language used; and
- (e) an indication of where detailed information can be obtained.

GEN 3.4.4-Requirements and conditions

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

GEN 3.5-Meteorological Services

GEN 3.5.1-Responsible service

A brief description of the meteorological service responsible for the provision of meteorological information, including –

- (*a*) the service name;
- (*b*) the postal address;
- (*c*) the telephone number;
- (*d*) the telefax number;
- (e) e-mail address;
- (*f*) the AFS address;
- (*g*) website address, where available;
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- (*i*) an indication if service is not H24.

GEN 3.5.2 – Area of responsibility

A brief description of the area and air routes for which meteorological service is provided.

GEN 3.5.3 – Meteorological observations and reports

A detailed description of the meteorological observations and reports provided for international air navigation, including the -

- (a) name of the station and the ICAO location indicator;
- (*b*) type and frequency of observation including an indication of automatic observing equipment;
- (c) types of meteorological reports such as METAR and avail-ability of a trend forecast;
- (d) specific type of observation system and number of observation sites used to observe and report surface wind, visibility, runway visual range, cloud base, temperature and where applicable, wind shear measured by an anemometer at intersection of runways and transmissometer next to touch-down zone.
- (e) hours of operation; and
- (f) indication of aeronautical climatological information available.

GEN 3.5.4 – Types of services

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

GEN 3.5.5—Notification required from operators

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

GEN 3.5.6 – Aircraft reports

As necessary, requirements of the unit responsible for meteorological services for the making and transmission of aircraft reports.

GEN 3.5.7 – VOLMET service

Description of VOLMET or VOLMET service, including the-

- (*a*) name of transmitting station;
- (*b*) call sign or identification and abbreviation for the radio communication emission;

- (c) frequency or frequencies used for broadcast;
- (*d*) broadcasting period;
- (e) hours of service;
- (*f*) list of aerodromes and heliports for which reports and forecasts are included; and
- (g) reports, forecasts and SIGMET information included and remarks.

GEN 3.5.8-SIGMET and AIRMET service

Description of the meteorological watch provided within flight information regions or control areas for which ATS are provided, including a list of the meteorological watch offices with the —

- (a) name of the meteorological watch office, ICAO location indicator;
- (*b*) hours of service;
- (c) flight information region or control area served;
- (*d*) SIGMET validity periods;
- *(e)* specific procedures applied to SIGMET information such as for volcanic ash and tropical cyclones;
- *(f)* procedures applied to AIRMET information in accordance with relevant regional air navigation agreements;
- (g) ATS unit provided with SIGMET and AIRMET information; and
- (*h*) additional information such as limitation of service.

GEN 3.5.9—Other automated meteorological services

Description of available automated services for the provision of meteorological information such as automated pre-flight information service accessible by telephone and computer modem including the –

(*a*) service name;

- (b) information available;
- (c) areas, routes and aerodromes covered; and
- (*d*) telephone and telefax numbers, e-mail address and where available, website address.

GEN 3.6-Search and Rescue

GEN 3.6.1—Responsible service

Brief description of service responsible for the provision of SAR, including –

- (*a*) the service and unit name;
- (*b*) the postal address;
- (*c*) the telephone number;
- (*d*) the telefax number;
- (e) e-mail address;
- (*f*) the AFS address;
- (g) website address, where available; and
- (*h*) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

GEN 3.6.2 – Area of responsibility

A brief description of area of responsibility within which SAR services are provided.

GEN 3.6.3 – Types of service

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

GEN 3.6.4-SAR agreements

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

GEN 3.6.5 – Conditions of availability

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

GEN 3.6.6—Procedures and signals used

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

GEN 4.—CHARGES FOR AERODROMES, HELIPORTS AND AIR NAVIGATION SERVICES

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

GEN 4.1—Aerodrome and heliport charges

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

- (*a*) the landing of aircraft;
- (b) the parking, hangarage and long-term storage of aircraft;
- (c) the passenger service;
- (*d*) the security;
- (e) the noise-related items;
- (f) other information such as, customs, health and immigration;
- (g) the exemptions and reductions; and
- (*h*) methods of payment.

GEN 4.2—Air navigation services charges

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

- (*a*) approach control;
- (*b*) route air navigation services;
- (*c*) cost basis for air navigation services and exemptions and reductions; and
- (*d*) methods of payment.

PART 2–EN ROUTE (ENR)

Where an AIP is produced and made available in more than one (1) volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments must be included in each volume. In the case of an AIP being published as one (1) volume, the annotation "not applicable" must be entered against each of the above sub-sections.

Reference must be made in the appropriate subsection to indicate that differences between national regulations and ICAO SARPs and procedures exist and that they are detailed in GEN 1.7.

ENR 0.6-Table of Contents to Part 2

A list of sections and subsections contained in Part 2–*En route*.

Note: Subsections may be listed alphabetically.

ENR 1. GENERAL RULES AND PROCEDURES

ENR 1.1-General Rules

Publication of the general rules as applied within the Georgetown Flight Information Region.

ENR 1.2 – Visual Flight Rules

Publication of the VFR as applied within the Georgetown Flight Information Region.

ENR 1.3—Instrument Flight Rules

Publication of the instrument flight rules as applied within the Georgetown Flight Information Region.

ENR 1.4-ATS Airspace Classification and Description

ENR 1.4.1 ATS Airspace Classification

The description of ATS airspace classes, in the form of the ATS airspace classification table set out in Schedule 5, and appropriately annotated to indicate those airspace classes not used by the Georgetown Flight Information Region.

ENR 1.4.2 ATS Airspace Description

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

ENR 1.5 Holding, Approach and Departure Procedures

ENR 1.5.1-General

A statement setting out the criteria on which holding, approach and departure procedures are established. Where the format is different from the ICAO requirements the presentation of criteria should be in a tabular form.

ENR 1.5.2—Arriving Flights

Presentation of conventional or area navigation procedures for arriving flights which are common to flights into or within the same type of airspace. Where different procedures apply within a terminal airspace, a note to this effect must be given together with a reference to where the specific procedures can be found.

ENR 1.5.3 – Departing Flights

Presentation of conventional or area navigation procedures for departing flights which are common to flights departing from any aerodrome or heliport.

ENR 1.5.4 - Other Relevant Information and Procedures

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

ENR 1.6-ATS Surveillance Services and Procedures

ENR 1.6.1—Primary Radar

A description of primary radar services and procedures, including the-

- (a) supplementary services;
- (*b*) the application of radar control service;
- (c) radar and air-ground communication failure procedures;
- (*d*) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of radar coverage.

ENR 1.6.2-Secondary Surveillance Radar

A description of SSR operating procedures, including-

- (*a*) emergency procedures;
- (*b*) air-ground communication failure and unlawful interference procedures;
- (c) the system of SSR code assignment;
- (d) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of SSR coverage.
- *Note: The SSR description is of particular importance in areas or routes where the possibility of interception exists.*

ENR 1.6.3 Automatic dependent surveillance broadcast (ADS-B)

Description of Automatic dependent surveillance – broadcast (ADS-B) operating procedures, including -

- (a) emergency procedures;
- (b) air-ground communication failure and unlawful interference procedures;
- (c) aircraft identification requirements;
- (d) voice and CPDLC position reporting requirements; and
- (e) graphic portrayal of area of ADS-B coverage.

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

ENR 1.6.4 - Other Relevant Information and Procedures

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

ENR 1.7-Altimeter Setting Procedures

A statement of altimeter setting procedures in use, containing -

- (*a*) brief introduction with a statement concerning the ICAO documents on which the procedures are based together with differences to ICAO provisions, if any;
- (*b*) basic altimeter setting procedures;
- (c) description of altimeter setting region;
- (d) procedures applicable to operators including pilots; and
- (e) table of cruising levels.

ENR 1.8-Regional Supplementary Procedures

Presentation of SUPPS affecting the entire area of responsibility, with properly annotated national differences, if any.

ENR 1.9-Air Traffic Flow Management

A brief description of ATFM system, including the-

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

ENR 1.10—Flight Planning

An indication of any restriction, limitation or advisory information related to the flight planning stage which may assist the user in the presentation of the intended flight operation, including the -

- (*a*) procedures for the submission of a flight plan;
- (b) repetitive flight plan system; and
- (c) changes to the submitted flight plan.

ENR 1.11-Addressing of Flight Plan Messages

An indication, in tabular form, of the addresses allocated to flight plans, showing the -

- (a) category of flight such as IFR, VFR;
- (b) route into or through the FIR or TMA; and
- (c) message address.

ENR 1.12-Interception of Civil Aircraft

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

ENR 1.13-Unlawful Interference

A presentation of appropriate procedures to be applied in case of unlawful interference.

ENR 1.14-Air Traffic Incidents

A description of air traffic incidents reporting system, including the:

- (*a*) definition of air traffic incidents;
- (*b*) use of the Air Traffic Incident Reporting Form;
- (c) reporting procedures including in-flight reporting procedures; and

(*d*) purpose for reporting and handling of the form.

ENR 2.—AIR TRAFFIC SERVICES AIRSPACE

ENR 2.1 - FIR, UIR, TMA AND CTA

A detailed description of flight information regions, upper flight information regions, and control areas (including specific CTA such as TMA), including:

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

Control zones around military air bases not otherwise described in the AIP must be included under this heading.

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

A description of designated areas over which the carriage of an ELT is required and where aircraft shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two (2) channels.

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

ENR 2.2 – Other Regulated Airspace

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

ENR 3.—ATS ROUTES

- Note 1: Bearings, tracks and radials are normally magnetic. In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, such as True North or Grid North, may be used.
- Note 2: Change over points established at the midpoint between two (2) radio navigation aids, or at the intersection of the two (2) radials in the case of a route which changes direction between the navigation aids, need not be shown for each route segment if a general statement regarding their existence is made.
- ENR 3.1-Lower ATS Routes

Detailed description of lower ATS routes, including the -

- (a) route designator, designation of the navigation specification applicable to a specified segment, name, coded designator or name-code and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;
- (b) tracks or VOR radials to the nearest degree, geodetic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- *(c)* upper and lower limits or minimum *en route* altitudes, to the nearest higher one hundred feet (100 ft) and airspace classification;
- (*d*) lateral limits and minimum obstacle clearance altitudes;
- (e) direction of cruising levels; and
- *(f)* remarks, including an indication of the controlling unit, its operating channel and, where applicable, its logon address and any navigation specification limitations.
- Note: In relation to Schedule 2 and for flight planning purposes, the specified RNP type is not considered to be an integral part of the route designator.

ENR 3.2 – Upper ATS Routes

A detailed description of upper ATS routes, including the -

- (a) route designator, designation of navigation specification applicable to a specified segment, name, coded designator or name-code and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including "compulsory" or "on-request" reporting points;
- (b) track or VOR radial to the nearest degree, geodetic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- (*c*) upper and lower limits or minimum en-route altitudes, to the nearest higher 50 m or 100 ft, and airspace classification;
- (*d*) lateral limits and minimum obstacle clearance altitudes;
- (*e*) direction of cruising levels;
- (*f*) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- (g) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address and any navigation specification limitations.
- Note: In relation to Schedule 2 and for flight planning purposes, the specified RNP type is not considered to be an integral part of the route designator.

ENR 3.3-Area Navigation Routes

A detailed description of area navigation routes, including the-

(1) route designator, designation of navigation specification applicable to a specified segment, name, coded designator or name-code and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including compulsory or on-request reporting points;

(2) in respect of waypoints defining a VOR or DME area navigation route, including the:

- (a) station identification of the reference VOR or DME;
- (*b*) bearing to the nearest degree and the distance to the nearest tenth of a kilometre or tenth of a nautical mile from the

reference VOR or DME, if the waypoint is not collocated with it; and

(c) elevation of the transmitting antenna of DME to the nearest thirty metres (30 m) or one hundred feet (100 ft);

(3) magnetic bearing to the nearest degree, geodetic distance to the nearest tenth of a kilometre or tenth of a nautical mile between defined endpoints and distance between each successive designated significant point;

- (4) upper and lower limits and airspace classification;
- (5) direction of cruising levels; and

(6) remarks, including an indication of the controlling unit, its operating channel and where applicable, its logon address and any navigation specification limitations.

Note: In relation to Schedule 2 and for flight planning purposes, the specified RNP type is not considered to be an integral part of the route designator.

ENR 3.4 – Helicopter Routes

A detailed description of helicopter routes, including the -

(1) route designator, designation of navigation specification applicable to a specified segment, name, coded designator or name-code and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including compulsory or on-request reporting points;

(2) tracks or VOR radials to the nearest degree, geodetic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;

(3) upper and lower limits and airspace classification;

(4) minimum flight altitudes to the nearest higher one hundred feet (100 ft); and

(5) remarks, including an indication of the controlling unit and its operating frequency.

Note: In relation to Schedule 2 and for flight planning purposes, the specified RNP type is not considered to be an integral part of the route designator.

ENR 3.5–Other Routes

A description of other specifically designated routes which are compulsory within specified area.

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

ENR 3.6—En Route Holding

A detailed description of en route holding procedures, containing the -

(1) holding identification where applicable and holding fix (navigation aid) or waypoint with geographical coordinates in degrees, minutes and seconds;

- (2) inbound track;
- (3) direction of the procedure turn;
- (4) maximum indicated airspeed;
- (5) minimum and maximum holding level;
- (6) time and distance outbound; and
- (7) indication of the controlling unit and its operating frequency.
- Note: Obstacle clearance criteria related to holding procedures are contained in ICAO Doc 8168 "Procedures for Air Navigation Services—Aircraft Operations PANS-OPS", Volumes I and II.

ENR 4.-RADIO NAVIGATION AIDS AND SYSTEMS

ENR 4.1-Radio Navigation Aids-En Route

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

(1) the name of the station and magnetic variation to the nearest degree and for VOR, station declination to the nearest degree used for technical line-up of the aid;

(2) the identification code;

(3) the frequency and channel for each element;

(4) the hours of operation;

(5) the geographical coordinates in degrees, minutes and seconds of the position of the transmitting antenna;

(6) the elevation of the transmitting antenna of DME to the nearest thirty metres (30 m) or one hundred feet (100 ft); and

(7) remarks.

Where the operating authority of the facility is not the Authority, the name of the operating authority and facility coverage must be indicated in the remarks column.

ENR 4.2-Special Navigation Systems

A description of stations associated with special navigation systems such as DECCA and LORAN, including –

(1) the name of station or chain;

(2) the type of service available such as master signal, slave signal and colour;

(3) the frequency of operations together with the channel number, basic pulse rate, recurrence rate, as applicable;

(4) the hours of operation;

(5) the geographical coordinates in degrees, minutes and seconds of the position of the transmitting station; and

(6) remarks.

Where the operating authority of the facility is not the Authority, the name of the operating authority and facility coverage must be indicated in the remarks column.

ENR 4.3-Global Navigation Satellite System

A list and description of elements of the global navigation satellite system providing the navigation service established for *en route* purposes and arranged alphabetically by name of the element, including —

(1) the name of the GNSS element such as GPS, GLONASS, EGNOS, MSAS and WAAS;

(2) the frequency, as appropriate;

(3) the geographical coordinates in degrees, minutes and seconds of the nominal service area and coverage area; and

(4) remarks.

Where the operating authority of the facility is not the Authority, the name of the operating authority must be indicated in the remarks column.

ENR 4.4-Name-Code Designators for Significant Points

An alphabetically arranged list of five-letter pronounceable name-code designators established for significant points at positions other than the site of radio navigation aids, including the —

(1) name-code designator;

(2) geographical coordinates in degrees, minutes and seconds of the position; and

(3) reference to ATS or other routes where the point is located.

(4) remarks, including supplementary definition of positions where required.

ENR 4.5 – Aeronautical Ground Lights – En Route

A list of aeronautical ground lights and other light beacons designating geographical positions which are selected by the Authority as being significant, including the—

(1) name of the city or town or other identification of the beacon;

- (2) type of beacon and intensity of the light in thousands of candelas;
- (3) characteristics of the signal;
- (4) operational hours; and
- (5) remarks.

ENR 5.-NAVIGATION WARNINGS

ENR 5.1-Prohibited, Restricted and Danger Areas

A description, supplemented by graphic portrayal where appropriate, of prohibited, restricted and danger areas together with information regarding their establishment and activation, including—

(1) the identification, name and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;

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

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

ENR 5.2 – Military Exercise and Training Areas and Air Defence Identification Zone

A description, supplemented by graphic portrayal where appropriate, of established military training areas and military exercises taking place at regular intervals, and established air defence identification zone ADIZ, including –

(1) the geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;

(2) the upper and lower limits and system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures; and

(3) remarks.

Time of activity and risk of interception in the event of penetration of ADIZ must be indicated in the remarks section.

ENR 5.3—Other Activities of a Dangerous Nature and other Potential Hazards

ENR 5.3.1—Other Activities of a Dangerous Nature

A description, supplemented by charts where appropriate, of activities that could affect flights including the -

(1) the geographical coordinates in degrees and minutes of centre of area and range of influence;

- (2) the vertical limits of activities of a dangerous nature;
- (3) the advisory measures;
- (4) the authority responsible for the provision of information; and
- (5) remarks, including time of activity.

ENR 5.3.2 – Other Potential Hazards

A description, supplemented by charts where appropriate, of other potential hazards such as active volcanoes, nuclear power stations that could affect flights, including—

- (*a*) the geographical coordinates in degrees and minutes of location of potential hazard;
- (*b*) the vertical limits of the potential hazards;
- (c) any advisory measures;
- (*d*) the authority responsible for the provision of information; and
- (e) remarks.

ENR 5.4-Air Navigation Obstacles

The list of obstacles affecting air navigation in Area 1, including the -

- (*a*) obstacle identification or designation;
- (*b*) type of obstacle;
- (*c*) obstacle position, represented by geographical coordinates in degrees, minutes and seconds;
- (*d*) obstacle elevation and height to the nearest metre or foot;
- (e) type and colour of obstacle lighting where applicable; and

- (*f*) if appropriate, an indication that the list of obstacles is avail-able in electronic form, and a reference to GEN 3.1.6.
- Note 1: An obstacle whose height above the ground is one hundred metres (100 *m*) and higher is considered an obstacle for Area 1.
- Note 2: Specifications governing the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations/heights for obstacles in Area 1 are given in Tables 1 and 2 of Schedule 6.

ENR 5.5—Aerial Sporting and Recreational Activities

A brief description, supplemented by graphic portrayal where appropriate, of intensive aerial sporting and recreational activities together with conditions under which they are carried out, including —

- (a) the designation and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area or control zone boundaries;
- (b) the vertical limits of the aerial, sporting and recreational activities;
- (c) the operator or user telephone number; and
- (d) remarks.

Note 1: The time of activity must be indicated in the remarks section.

Note 2: This paragraph may be subdivided into different sections for each different category of activity, giving the indicated details in each case.

ENR 5.6—Bird Migration and Areas with Sensitive Fauna

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

ENR 6. – En Route Charts

En route Chart–ICAO and index charts to be included in this section.

PART 3-AERODROMES (AD)

Where an AIP is produced and made available in more than one (1) volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments must be included in each volume. In the case of an AIP being published as one (1) volume, the annotation "not applicable" must be entered against each of the above sub-sections.

AD 0.6-Table of Contents to Part 3

A list of sections and subsections contained in Part 3–Aerodromes.

AD 1. AERODROMES/HELIPORTS - INTRODUCTION

AD 1.1 - Aerodrome/Heliport Availability and Conditions of Use

AD 1.1.1 General Conditions

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

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

AD 1.1.2 - Use of Military Air Bases

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

AD 1.1.3 - Low Visibility Procedures (LVP)

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

AD 1.1.4 - Aerodrome Operating Minima

Details of aerodrome operating minima applied by the State.

AD 1.1.5 - Other Information

If applicable, other information of a similar nature.

AD 1.2-Rescue and Firefighting Services

AD 1.2.1-Rescue and Firefighting Services

A brief description of rules governing the establishment of rescue and firefighting services at aerodromes and heliports available for public use together with an indication of rescue and fire-fighting categories established by the aerodrome authority.

AD 1.3-Index to Aerodromes and Heliports

A list, supplemented by graphic portrayal, of aerodromes and heliports within Guyana, including the—

- (a) aerodrome or heliport name and ICAO location indicator;
- (*b*) type of traffic permitted to use the aerodrome or heliport such as international or national, IFR or VFR, scheduled or non-scheduled and private; and
- (*c*) reference to AIP, Part 3 subsection in which the aerodrome and heliport details are presented.

AD 1.4-Grouping of Aerodromes and Heliports

A brief description of the criteria applied by the Authority in grouping aerodromes and heliports such as international or national; primary or secondary, major or other and civil or military for the purpose of the production, distribution and provision of information.

AD 1.5 Status of Certification of Aerodromes

A list of aerodromes in Guyana, indicating the status of certification, including –

- (a) aerodrome name and ICAO location indicator;
- (b) date, if and where applicable, validity of certification; and
- (c) any remarks."

AD 2.—AERODROMES

In this Part the four asterisk "****" appearing at each heading is to be replaced by the relevant ICAO location indicator.

**** AD 2.1—Aerodrome Location Indicator and Name

The ICAO location indicator allocated to the aerodrome and the name of aerodrome must be provided. An ICAO location indicator must be an integral part of the referencing system applicable to all subsections in section AD 2. **** AD 2.2—Aerodrome Geographical and Administrative Data

Aerodrome geographical and administrative data including-

- (*a*) the aerodrome reference point represented by geographical coordinates in degrees, minutes and seconds and its site;
- (*b*) the direction and distance of aerodrome reference point from centre of the city or town which the aerodrome serves;
- *(c)* the aerodrome elevation to the nearest metre or foot, and reference temperature;
- (*d*) the geoid undulation at the aerodrome elevation position to the nearest metre or foot;
- (*e*) the magnetic variation to the nearest degree, date of information and annual change;
- (*f*) name of aerodrome operator, address, telephone, telefax, e-mail address, AFS address and where available, website address;
- (g) the types of traffic permitted to use the aerodrome such as IFR/VFR; and
- (*h*) remarks.

**** AD 2.3 – Operational Hours

A detailed description of the hours of operation of services at the aerodrome, such as -

- (*a*) aerodrome operator;
- (b) customs and immigration;
- (c) health and sanitation;
- (*d*) AIS briefing office;
- (e) ATS reporting office;
- (*f*) MET briefing office;
- (*g*) air traffic service;

- (*h*) fuelling;
- (*i*) handling;
- (*j*) security;
- (*k*) de-icing where applicable; and
- (*l*) remarks.

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**** AD 2.4—Handling Services and Facilities
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A detailed description of the handling services and facilities available at the aerodrome, such as -

- (a) cargo-handling facilities;
- (b) fuel and oil types;
- (*c*) fuelling facilities and capacity;
- (*d*) de-icing facilities where available;
- (e) hangar space for visiting aircraft;
- (f) repair facilities for visiting aircraft; and
- (g) remarks.

**** AD 2.5-Passenger Facilities

A brief description of passenger facilities available at the aerodrome, such as -

- (*a*) hotels at or in the vicinity of aerodrome;
- (b) restaurants at or in the vicinity of aerodrome;
- (c) transportation options;
- (d) medical facilities;
- (e) banks and post offices at or in the vicinity of aerodrome;
- (f) tourist offices; and

(g) remarks.

**** AD 2.6 – Rescue and Firefighting Services

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

- (a) aerodrome category for firefighting;
- (*b*) rescue equipment;
- (c) capability for removal of disabled aircraft; and
- (*d*) remarks.

**** AD 2.7 - Seasonal Availability - Clearing

A detailed description of the equipment and operational priorities established for the clearance of aerodrome movement areas, including –

- (*a*) the type of clearing equipment;
- (b) clearance priorities; and
- (c) remarks.

**** AD 2.8—Aprons, Taxiways and Check Locations or Positions Data

Details related to the physical characteristics of aprons, taxiways and check locations or positions of designated checkpoints, including —

- (*a*) the surface and strength of aprons;
- (*b*) the width, surface and strength of taxiways;
- (c) the location and elevation to the nearest metre or foot of altimeter checkpoints;
- (*d*) the location of VOR checkpoints;
- (*e*) the position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- (f) remarks.

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

**** AD 2.9—Surface Movement Guidance and Control System and Markings

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

- (*a*) the use of aircraft stand identification signs, taxiway guide lines and visual docking or parking guidance system at aircraft stands;
- (b) the runway and taxiway markings and lights;
- (c) stop bars where applicable; and
- (*d*) remarks.

**** AD 2.10-Aerodrome Obstacles

A detailed description of obstacles, in respect of:

- (1) obstacles in Area 2 as follows:
 - (a) obstacle identification or designation;
 - (b) type of obstacle;
 - (c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - (*d*) obstacle elevation and height to the nearest metre or foot;
 - (*e*) obstacle marking, and type and colour of obstacle lighting where applicable;
 - (*f*) if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6; and
 - (*g*) NIL indication, if appropriate.
- Note 1: Sub-clause 1(1)(b) of Part H, provides a description of Area 2 while, Figure 2 of Schedule 15 contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.
- Note 2: Specifications governing the determination and reporting accuracy of field work and data integrity of positions latitude and longitude and elevations

for obstacles in Area 2 are given in Tables 1 and 2 of Schedule 6, and Tables A-1 and A-2 in Schedule 9, Volume 1 of Appendix 14, respectively.

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

- (a) obstacles that penetrate the obstacle limitation surfaces;
- (*b*) obstacles that penetrate the take-off flight path area obstacle identification surface; and
- (c) other obstacles assessed as being hazardous to air navigation.

(3) indication that information on obstacles in Area 3 is not provided, or where provided, the following information is given:

- (*a*) the obstacle identification or designation;
- (*b*) the type of obstacle;
- *(c)* the obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
- (*d*) the obstacle elevation and height to the nearest metre or foot;
- (*e*) the obstacle marking, and type and colour of obstacle lighting where applicable;
- (*f*) if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6; and
- (*g*) a NIL indication, if appropriate.
- Note 1: Sub-clause 1(1)(c) of Part H, provides a description of Area 3 while Figure 3 of Schedule 15 contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.
- Note 2: Specifications governing the determination and reporting accuracy of field work and data integrity of positions latitude and longitude) and elevations for obstacles in Area 3 are given in Appendix 5, Volume 1 of Annex 14 and Tables A-1 and A-2 in Schedule 9, respectively.

**** AD 2.11—Meteorological Information Provided

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

- (a) the name of the associated meteorological office
- (*b*) the hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- (*c*) the office responsible for preparation of TAFs and periods of validity and interval of issuance of the forecasts;
- (*d*) the availability of the trend forecasts for the aerodrome, and interval of issuance;
- (e) the information on how briefing or consultation is provided;
- (*f*) types of flight documentation supplied and the language used in flight documentation;
- (g) charts and other information displayed or available for briefing or consultation;
- (h) supplementary equipment available for providing information on meteorological conditions, such as weather radar and receiver for satellite images;
- (i) the ATS unit provided with meteorological information; and
- (*j*) any additional information such as limitation of service.

**** AD 2.12 - Runway Physical Characteristics

A detailed description of runway physical characteristics for each runway, including –

- (*a*) the designations;
- (b) true bearings to one-hundredth of a degree;
- (c) the dimensions of runways to the nearest metre or foot;
- (*d*) the strength of pavement to include PCN and associated data and surface of each runway and associated stopways;
- (e) the geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end, and geoid undulation of –
 - (i) thresholds of a non-precision approach runway to the nearest metre or foot; and
 - (ii) thresholds of a precision approach runway to the nearest tenth of a metre or tenth of a foot;
- (f) elevations of
 - (i) thresholds of a non-precision approach runway to the nearest metre or foot; and
 - (ii) thresholds and the highest elevation of the touchdown zone of a precision approach runway to the nearest tenth of a metre of tenth of a foot;
- (g) the slope of each runway and associated stopways;
- (*h*) the dimensions of stopway where applicable to the nearest metre or foot;
- (*i*) the dimensions of clearway where applicable to the nearest metre or foot;
- (*j*) the dimensions of strips;
- (*k*) the existence of an obstacle-free zone; and
- (*l*) remarks.

**** AD 2.13 – Declared Distances

A detailed description of declared distances to the nearest metre or foot for each direction of each runway, including—

- (*a*) the runway designator;
- (*b*) the take-off run available;
- (*c*) the take-off distance available;
- (*d*) the accelerate-stop distance available;

- (e) the landing distance available; and
- (f) remarks.

Where a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this must be declared and the words "not usable" or the abbreviation "NU" entered.

**** AD 2.14 – Approach and Runway Lighting

A detailed description of approach and runway lighting, including -

- (*a*) the runway designator;
- (b) the type, length and intensity of approach lighting system;
- (c) the runway threshold lights, colour and wing bars;
- (*d*) the type of visual approach slope indicator system;
- (e) the length of runway touchdown zone lights;
- (*f*) the length, spacing, colour and intensity of runway centre line lights;
- (g) the length, spacing, colour and intensity of runway edge lights;
- (*h*) the colour of runway end lights and wing bars;
- (i) the length and colour of stopway lights; and
- (*j*) remarks.

**** AD 2.15 – Other Lighting, Secondary Power Supply

A description of other lighting and secondary power supply, including -

- (*a*) the location, characteristics and hours of operation of aerodrome beacon or identification beacon where applicable;
- (*b*) the location and lighting where applicable of anemometer or landing direction indicator;
- (c) the taxiway edge and taxiway centre line lights;
- (d) secondary power supply including switch-over time; and

(e) remarks.

**** AD 2.16 – Helicopter Landing Area

A detailed description of helicopter landing area provided at the aerodrome, including –

- (a) the geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation of the geometric centre of touchdown and lift-off or of each threshold of final approach and take-off area where appropriate –
 - (i) for non-precision approaches, to the nearest metre of foot; and
 - (ii) for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- (*b*) the TLOF and FATO area elevation
 - (i) for non-precision approaches, to the nearest metre or foot; and
 - (ii) for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- (*c*) the TLOF and FATO area dimensions to the nearest metre or foot, surface type, bearing strength and marking;
- (*d*) true bearings to one-hundredth of a degree of FATO;
- (e) the declared distances available, to the nearest metre or foot;
- (f) the approach and FATO lighting; and
- (g) remarks.

**** AD 2.17 – Air Traffic Services Airspace

A detailed description of ATS airspace organised at the aerodrome, including –

- (*a*) the airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- (*b*) the vertical limits;

- (*c*) the airspace classification;
- (*d*) the call sign and language of the ATS unit providing service;
- (e) the transition altitude; and
- (f) remarks.

**** AD 2.18 – Air Traffic Services Communication Facilities

A detailed description of air traffic services communication facilities established at the aerodrome, including—

- (*a*) the service designation;
- (*b*) the call sign;
- (c) channel
- (*d*) logon address, as appropriate;
- (e) hours of operation; and
- (f) remarks

**** AD 2.19-Radio Navigation and Landing Aids

A detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the aerodrome, including –

- (a) the type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS or MLS, basic GNSS, SBAS, and GBAS and for VOR, ILS and MLS also station declination to the nearest degree used for technical line-up of the aid;
- (*b*) the identification, if required;
- (*c*) the frequency, as appropriate;
- (*d*) the hours of operation, as appropriate;
- (e) the geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;

- (*f*) the elevation of the transmitting antenna of DME to the nearest thirty metres (30 m) or one hundred feet (100 ft) and of DME/P to the nearest three metres (3 m) or ten feet (10 ft); and
- (g) remarks.

When the same aid is used for both en route and aerodrome purposes, a description must also be given in section ENR 4. Where the GBAS serves more than one (1) aerodrome, description of the aid must be provided under each aerodrome. Where the operating authority of the facility is not the Authority, the name of the operating authority and facility coverage must be indicated in the remarks column.

**** AD 2.20-Local Traffic Regulations

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

**** AD 2.21-Noise Abatement Procedures

A detailed description of noise abatement procedures established at the aerodrome.

**** AD-2.22 Flight Procedures

A detailed description of the conditions and flight procedures, including radar or ADS-B procedures, established on the basis of airspace organisation at the aerodrome and where established, detailed description of the low visibility procedures at the aerodrome, including –

- (*a*) runways and associated equipment authorised for use under low visibility procedures;
- (*b*) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made; and
- *(c)* description of ground marking/lighting for use under low visibility procedures.

**** AD 2.23-Additional Information

Additional information at the aerodrome, such as an indication of bird concentrations at the aerodrome, together with an indication of significant daily movement between resting and feeding areas, to the extent practicable. Charts related to an aerodrome are to be included in the following order:

- (*a*) Aerodrome and Heliport Chart–ICAO;
- (b) Aircraft Parking and Docking Chart–ICAO;
- (c) Aerodrome Ground Movement Chart–ICAO;
- (*d*) Aerodrome Obstacle Chart–ICAO Type A;
- (e) Aerodrome Terrain and Obstacle Chart ICAO (Electronic);
- (*f*) Precision Approach Terrain Chart ICAO for precision approach Categories II and III runways;
- (g) Area Chart ICAO for departure and transit routes;
- (*h*) Standard Departure Chart Instrument ICAO;
- (i) Area Chart ICAO for arrival and transit routes;
- (*j*) Standard Arrival Chart Instrument ICAO;
- (k) Radar ATC Surveillance Minimum Altitude Chart ICAO;
- (*l*) Instrument Approach Chart ICAO for each runway and procedure type;
- (*m*) Visual Approach Chart ICAO; and
- (*n*) bird concentrations in the vicinity of the aerodrome.

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

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

AD 3.-HELIPORTS

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

**** AD 3.1-Heliport Location Indicator and Name

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

**** AD 3.2 Heliport Geographical and Administrative Data

Heliport geographical and administrative data shall be provided, including -

- (*a*) the heliport reference point represented by geographical coordinates in degrees, minutes and seconds and its site;
- (*b*) the direction and distance of heliport reference point from centre of the city or town which the heliport serves;
- (*c*) the heliport elevation to the nearest metre or foot, and reference temperature;
- (*d*) the geoid undulation at the heliport elevation position to the nearest metre or foot;
- (*e*) the magnetic variation to the nearest degree, date of information and annual change;
- (*f*) name of heliport operator, address, telephone, telefax, e-mail address, AFS address and, where available, website address;
- (*g*) the types of traffic permitted to use the heliport such as IFR or VFR; and
- (h) remarks.

**** AD 3.3 Operational Hours

A detailed description of the hours of operation of services at the heliport, such as -

- (*a*) heliport operator;
- (b) customs and immigration;
- (c) health and sanitation;
- (*d*) AIS briefing office;

- (e) ATS reporting office;
- (*f*) MET briefing office;
- (g) air traffic service;
- (*h*) fuelling;
- (*i*) handling;
- (*j*) security;
- (*k*) de-icing, as applicable; and
- (l) remarks.

**** AD 3.4—Handling Services and Facilities

A detailed description of the handling services and facilities available at the heliport, such as -

- (a) cargo-handling facilities;
- (b) fuel and oil types;fuelling facilities and capacity;
- (c) de-icing facilities;
- (*d*) hangar space for visiting helicopters;
- (e) repair facilities for visiting helicopters; and
- (f) remarks.

**** AD 3.5-Passenger Facilities

A brief description of passenger facilities available at the heliport, such as -

- (*a*) hotels at or in the vicinity of the heliport;
- (b) restaurants at or in the vicinity of the heliport;
- (c) transportation options;
- (*d*) medical facilities;
- (e) banks and post offices at or in the vicinity of the heliport;

- (f) tourist offices; and
- (g) remarks.

**** AD 3.6 – Rescue and Firefighting Services

A detailed description of the rescue and firefighting services and equipment available at the heliport, including –

- (*a*) the heliport category for firefighting;
- (*b*) the rescue equipment;
- (c) the capability for removal of disabled helicopter; and
- (*d*) remarks.

**** AD 3.7 – Seasonal Availability – Clearing

A detailed description of the equipment and operational priorities established for the clearance of heliport movement areas, including –

- (*a*) the types of clearing equipment;
- (*b*) the clearance priorities; and
- (c) remarks.

**** AD 3.8 – Aprons, Taxiways and Check Locations/Positions Data

A detailed description of the physical characteristics of aprons, taxiways and locations or positions of designated checkpoints, including—

- (*a*) the surface and strength of aprons, helicopter stands;
- (*b*) the width, surface type and designation of helicopter ground taxiways;
- (c) the width and designation of helicopter air taxiway and air transit route;
- (*d*) the location and elevation to the nearest metre or foot of altimeter checkpoints;

- (e) the location of VOR checkpoints;
- (*f*) the position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- (g) remarks.

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

**** AD 3.9-Markings and Markers

A brief description of final approach and take-off area and taxiway markings and markers, including –

- (*a*) the final approach and take-off markings;
- (*b*) the taxiway markings, air taxiway markers and air transit route markers; and
- (c) remarks.

**** AD 3.10 Heliport Obstacles

Detailed description of obstacles, including -

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

**** AD 3.11 Meteorological Information Provided

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

- (a) the name of the associated meteorological office;
- (*b*) the hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- *(c)* the office responsible for preparation of TAFs, and periods of validity of the forecasts;
- (*d*) the availability of the trend forecasts for the heliport, and interval of issuance;
- (e) the information on how briefing and/or consultation is pro-vided;
- (*f*) the type of flight documentation supplied and language used in flight documentation;
- (g) the charts and other information displayed or available for briefing or consultation;
- (*h*) the supplementary equipment available for providing information on meteorological conditions, such as weather radar and receiver for satellite images;
- (i) the ATS units provided with meteorological information; and
- (*j*) any additional information such as limitation of service.

**** AD 3.12-Heliport Data

A detailed description of the heliport dimensions and related information, including the:

- (a) the heliport type such as surface-level, elevated or helideck;
- (b) the TLOF area dimensions to the nearest metre or foot;
- (c) the true bearings to one-hundredth of a degree of FATO area;
- (*d*) the dimensions to the nearest metre or foot of FATO, and surface type;

- (e) the surface and bearing strength in tonnes of TLOF;
- *(f)* the geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation of the geometric centre of TLOF or of each threshold of FATO where appropriate
 - (i) for non-precision approaches, to the nearest metre or foot; and
 - (ii) for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- (g) the TLOF and FATO slope and elevation
 - (i) for non-precision approaches to the nearest metre or foot; and
 - (ii) for precision approaches to the nearest tenth of a metre of tenth of a foot;
- (*h*) the dimensions of safety area;
- (*i*) the dimensions, to the nearest metre or foot, of helicopter clearway;
- (*j*) the existence of an obstacle-free sector; and
- (k) remarks.

**** AD 3.13 – Declared Distances

A detailed description of declared distances to the nearest metre or foot, where relevant for a heliport, including the –

- (*a*) take-off distance available;
- (b) rejected take-off distance available;
- (c) landing distance available; and
- (*d*) remarks.

**** AD 3.14 – Approach and FATO Lighting

A detailed description of approach and FATO lighting, including -

(a) the type, length and intensity of approach lighting system;

- (b) the type of visual approach slope indicator system;
- (c) the characteristics and location of FATO area lights;
- (*d*) the characteristics and location of aiming point lights;
- (e) the characteristics and location of TLOF lighting system; and
- (f) remarks.

**** AD 3.15—Other Lighting, Secondary Power Supply

A description of other lighting and secondary power supply, including-

- (*a*) the location, characteristics and hours of operation of heliport beacon;
- (*b*) the location and lighting of WDI;
- (c) the taxiway edge and taxiway centre line lights;
- (d) the secondary power supply including switch-over time; and
- (e) remarks.

**** AD 3.16 – Air Traffic Services Airspace

A detailed description of ATS airspace organised at the heliport, including-

- (*a*) the airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- (*b*) the vertical limits of the ATS airspace at the heliport;
- (*c*) the airspace classification;
- (*d*) the call sign and language of ATS unit providing service;
- (*e*) the transition altitude; and
- (f) hours of applicability
- (g) remarks.

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

A detailed description of air traffic services communication facilities established at the heliport, including –

- (*a*) the service designation;
- (*b*) the call sign;
- (*c*) the frequency;
- (*d*) the hours of operation; and
- (e) remarks.

**** AD 3.18-Radio Navigation and Landing Aids

A detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the heliport, including –

- (*a*) the type of aids, magnetic variation for VOR, station declination used for technical line-up of the aid to the nearest degree, and type of operation for ILS, MLS, basic GNSS, SBAS, and GBAS;
- (*b*) the identification of the radio navigation and landing aids, if required;
- (*c*) the frequency, as appropriate;
- (*d*) the hours of operation, as appropriate;
- (e) the geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- (*f*) the elevation of the transmitting antenna of DME to the nearest one hundred feet (100 ft) and of DME/P to the nearest ten feet (10 ft); and
- (g) remarks.

Where the same aid is used for both *en route* and heliport purposes, a description must also be given in section ENR 4. Where the ground-based augmentation system (GBAS) serves more than one heliport, description of the aid must be provided under each heliport. Where the operating authority of the facility is not the Authority, the name of the operating authority and facility coverage must be indicated in the remarks column.

**** AD 3.19-Local Traffic Regulations

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

**** AD 3.20-Noise Abatement Procedures

A detailed description of noise abatement procedures established at the heliport.

**** AD 3.21-Flight Procedures

A detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organisation established at the heliport and where established, detailed description of the low visibility procedures at the heliport, including:

- (*a*) touchdown and lift-off (TLOF) area(s) and associated equipment authorised for use under low visibility procedures;
- (*b*) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made; and
- *(c)* description of ground marking/lighting for use under low visibility procedures and
- (d) remarks.

**** AD 3.22 – Additional Information

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

**** AD 3.23 – Charts Related to a Heliport

Charts related to a heliport shall be included in the following order:

- (*a*) Aerodrome and Heliport Chart–ICAO;
- (b) Area Chart–ICAO for departure and transit routes;
- (c) Standard Departure Chart–Instrument–ICAO;

- (*d*) Area Chart–ICAO for arrival and transit routes;
- (e) Standard Arrival Chart–Instrument–ICAO;
- (f) ATC Surveillance Minimum Altitude Chart ICAO;
- (g) Instrument Approach Chart–ICAO for each procedure type;
- (*h*) Visual Approach Chart–ICAO; and
- (*i*) A chart showing bird concentrations in the vicinity of heliport.

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

SCHEDULE 11

ASHTAM FORMAT

[Schedule 1 - Part C, Clause 2(4)]

| | | | ASHT | AM FO | ORMA' | Г | | | | | | | | | | |
|---|---------------------------------|----------|-----------------|-----------|---------------|---------------------------------|-------------|----------|--------|-------|-----------|----|--------|--|--|--|
| (COM | (PRIORITY | (ADD | RESSES) | | | | | | | | | | | | | |
| heading) | INDICATOR) | | | | | | | | | | | | | | | |
| | (DATE AND TIME | | | | (ORIGINATOR'S | | | | | | | | | | | |
| | OF FILING) | | | | | INDICATOR) | | | | | | | | | | |
| (Abbreviated | bbreviated (VA*2 SERIAL NUMBER) | | | | | (LOCATION DATE/TIME OF ISSUANCE | | | | | | | | | | |
| heading) | | | | INDIC | ATOR) | . | | | | | | | GROUP) | | | |
| | V A *2 | 2 | | | | | | | | | | | | | | |
| ASHTAM (Serial number) | | | | | | | | | | | | | | | | |
| (FLIGHT INFO | RMATION REGIO | N AFFI | ECTED) | | | | | | | | | A) | | | | |
| (DATE/TIME (UTC) OF ERUPTION) | | | | | | | | B) | | | | | | | | |
| (VOLCANO NAME AND NUMBER) | | | | | | | | C) | | | | | | | | |
| (VOLCANO LATITUDE/LONGITUDE OR VOLCANO RADIAL AND DISTANCE FROM NAVAID) | | | | | | | D) | | | | | | | | | |
| (VOLCANO LE CODE) ³ | VEL OF ALERT C | OLOU | R CODE, INC | LUDING | BANY P | RIOR | LEVEL | OF ALE | ERTO | COLO | UR | E) | | | | |
| (EXISTENCE AND HORIZONTAL/VERTICAL EXTENT OF VOLCANIC ASH CLOUD) ⁴ | | | | | | | F) | | | | | | | | | |
| (DIRECTION OF MOVEMENT OF ASH CLOUD) ⁴ | | | | | | | G) | | | | | | | | | |
| (AIR ROUTES OR PORTIONS OF AIR ROUTES AND FLIGHT LEVELS AFFECTED) | | | | | | | H) | | | | | | | | | |
| (CLOSURE OF AIR ROUTES A | AIRSPACE AND VAILABLE) | /OR All | R ROUTES O | R PORT | FIONS C | FAI | ROUTE | S, ANI | D ALT | FERN | ATIVE | I) | | | | |
| (SOURCE OF INFORMATION) | | | | | | | J) | | | | | | | | | |
| (PLAIN-LANGUAGE REMARKS) | | | | | | | K) | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | |
| 1. See also App | pendix 2 regarding | addre | ssee indicator | 's used i | n predet | ermir | ned distrib | oution s | syster | ns. | | | | | | |
| 2. *Enter ICAO | nationality letter a | is giver | n in ICAO Doc | 7910, F | Part 2. | | | | | | | | | | | |
| See paragra | ph 3.5 below. | | | | | | | | | | | | | | | |
| 4. Advice on th | le existence, exte | nt and | movement of | volcani | c ash cl | oud (| 3) and H) | may I | be ob | taine | d from th | e | | | | |
| Voicanic Ash | Advisory Centre(| s) resp | onsible for the | FIR COL | ncerned. | | | | | | | | | | | |
| 5. Item titles in | brackets () not to | be tran | ismitted. | | | | | | | | | | | | | |
| L | | | | | | | | | | | | | | | | |

SIGNATURE OF ORIGINATOR (not for transmission)

INSTRUCTIONS FOR THE COMPLETION OF THE ASHTAM FORMAT

1. General

- (*a*) the ASHTAM provides information on the status of activity of a volcano when a change in its activity is, or is expected to be of operational significance. This information is provided using the volcano level of alert colour code given in sub-clause 3(*e*) below;
- (*b*) in the event of a volcanic eruption producing ash cloud of operational significance, the ASHTAM also provides information on the location, extent and movement of the ash cloud and the air routes and flight levels affected;
- (c) issuance of an ASHTAM giving information on a volcanic eruption, in accordance with section 3 below, should not be delayed until complete information (A) to (K) is available but should be issued immediately following receipt of notification that an eruption has occurred or is expected to occur, or a change in the status of activity of a volcano of operational significance has occurred or is expected to occur, or an ash cloud is reported. In

the case of an expected eruption, and hence no ash cloud evident at that time, items (A) to (E) should be completed and items (F) to (I) indicated as "not applicable". Similarly, if a volcanic ash cloud is reported, e.g. by special air-report, but the source volcano is not known at that time, the ASHTAM should be issued initially with items (A) to (E) indicated as "unknown", and items (F) to (K) completed, as necessary, based on the special air-report, pending receipt of further information. In other circumstances, if information for a specific field (A) to (K) is not available indicate "NIL".

- (*d*) the maximum period of validity of ASHTAM is twenty-four hours;
- (e) new ASHTAM must be issued where there is a change in the level of alert.

2. Abbreviated Heading

Following the usual AFTN communications header, the abbreviated heading "TT AAiiii CCCC MMYYGGgg (BBB)" is included to facilitate the automatic processing of ASHTAM messages in computer data banks. The explanation of these symbols is:

- TT = data designator for ASHTAM = VA;
- AA = geographical designator for States, e.g. SY= Guyana [see Location Indicators (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators];
- iiii = ASHTAM serial number in a four-figure group;
- MMYYGGgg = date/time of report, whereby:
- MM = month, e.g. January = 01, December = 12

YY = day of the month

- GGgg = time in hours (GG) and minutes (gg) UTC;
- (BBB) = Optional group for correction to an ASHTAM message previously disseminated with the same serial number = COR.

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

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

VANZ0001 NZZO 11070620

3. Content of ASHTAM

- (a) Item A Flight information region affected, plain-language equivalent of the location indicator given in the abbreviated heading, in this example "Auckland Oceanic FIR";
- (*b*) Item B–Date and time (UTC) of first eruption;
- (c) Item C—Name of volcano, and number of volcano as listed in the ICAO Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features;
- (d) Item D—Latitude and Longitude of the volcano in whole degrees or radial and distance of volcano from NAVAID (as listed in the ICAO Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features);
- (*e*) Item E—Colour code for level of alert indicating volcanic activity, including any previous level of alert colour code as follows:

| Level of Alert Colour Code | Status of Activity of Volcano | | | | | | |
|----------------------------|--|--|--|--|--|--|--|
| GREEN ALERT | Volcano is in normal, non-eruptive state; or, after a change from a higher alert level: Volcanic activity considered to have ceased and volcano reverted to its normal, non-eruptive state. | | | | | | |
| YELLOW ALERT | Volcano is experiencing signs of elevated unrest above known background levels. <i>or, after a change from higher alert level:</i> Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase. | | | | | | |

| ORANGE ALERT | Volcano is exhibiting heightened unrest with increased likelihood of eruption; <i>or</i> , Volcanic eruption is underway with no or minor ash emission. [<i>specify ash-plume height where possible</i>]. |
|--|--|
| RED ALERT | Eruption is forecasted to be imminent with significant emission of ash into the atmosphere likely; <i>or</i> , Eruption is underway with significant emission of ash into the atmosphere [<i>specify ash-plume height if possible</i>]. |
| Note. — The colour code for the level of alert indi- a previous status of activity should be provided to in the State concerned, e.g. "RED ALERT FOI ORANGE | cating the status of activity of the volcano and any change from the area control centre by the responsible vulcanological agency LOWING YELLOW" OR "GREEN ALERT FOLLOWING |

- (f) Item F—Where volcanic ash cloud of operational significance is reported, indicate the horizontal extent and base and top of the ash cloud using latitude and longitude in whole degrees and altitudes in thousands of metres or feet or radial and distance from source volcano;
- (g) Information initially may be based only on special air-report, but subsequent information may be more detailed based on advice from the responsible meteorological watch office and/or volcanic ash advisory centre;
- (*h*) Item G—Indicate forecast direction of movement of the ash cloud at selected levels based on advice from the responsible meteorological watch office and/or volcanic ash advisory centre;
- (*i*) Item H—Indicate air routes and portions of air routes and flight levels affected, or expected to become affected;
- (*j*) Item I—Indicate closure of airspace, air routes or portions of air routes, and availability of alternative routes;
- (*k*) Item J—Source of the information, e.g. "special air-report" or "volcanological agency", etc. The source of information should always be indicated, whether an eruption has actually occurred or ash cloud reported, or not; and
- (*l*) Item K—Include in plain language any operationally significant information additional to the foregoing.

SCHEDULE 12

PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM

[Schedule 8, Part C - Clause 3(8)]

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

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

(a) First and second letters:

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

(b) Third and fourth letters:

The letters "ZZ" indicating a requirement for special distribution.

(c) Fifth letter:

The fifth letter differentiating between NOTAM (letter "N") and ASHTAM (letter "V").

(*d*) Sixth and seventh letters:

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

Note: The fifth, sixth and seventh letters replace the three-letter designator YNY which, in the normal distribution system, denotes an international NOTAM office.

(e) Eighth letter:

The eighth position letter shall be the filler letter "X" to complete the eight-letter addressee indicator.

3. The Authority shall inform the States from which it received NOTAM of the sixth and seventh letters to be used under different circumstances to ensure proper routing.

SCHEDULE 13

[Schedule 8, Part C, Clauses 2(1) and (13)]

NOTAM FORMAT

| Priority indicator | | | | | | | | | | | | |
|----------------------------------|--------------|---------------------------|----------------|---------|--|----------|--------|----------|---------|---------|---------|---------------|
| Address | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Date and time of filing | | | | | | | | | | | | |
| Originator's indicator | | | | | | | | | | | | |
| 100001111 | | Messa | ge series, n | umber | and id | entifier | | | | | | |
| NOTAM containing new informati | | NOTAMN | | | | | | | | | | |
| | (series and | | | | | | | | | | | |
| NOTAM replacing a previous NOTAM | | | | | NOTAMR | | | | | | | |
| | | (carias and number/score) | | | (series and number/year of NOATM to be replaced) | | | | | | | |
| NOTAM canceling a previous NO | TAM | 1361 K-3 min | a maniforni ye | ** 7 | NOT | AMC | | | | | | |
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| FIR NOTAMO | da Traffic | Purpose | Qui | antiers | auser | Une | | | Ca | ordinat | ac Radi | in to |
| TIK NOTAM CO | Ne Hame | Furpose | e scope | lin | mit | limi | t . | | 0 | orumai | es, Rau | 145 |
| Q) / Q | | | 77 | | Π | | 17 | | | | | |
| Identification of ICAO location | indicator in | which the f | facility airs | pace o | r condi | ition | -4 | _ | | | | |
| reported on is located | | | | | | | | A) | | | | - |
| | | | Period | of Vali | dity | | | | | | | |
| From (date-time group) | | D) | | | | | | | | | | - |
| To (PERM or data-time group) | | в) | | | | | | + | - | - | | EST* |
| ro (r isrent of unce-time group) | | C) | | | | | | | | | | PERM* |
| Time Schedule (if applicable) | | | | | | | | - | | | | |
| | | D) | | | | | | | | | | |
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| Upper Limit | | | | | | | | | | | | |
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| Signature | | | | | | | | | | | | |

* Delete as appropriate

INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT

1. General

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

2. NOTAM numbering

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

3. Qualifiers Item Q

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

(*a*) FIR—

- (i) where the subject of the information is located geographically within one FIR, the ICAO location indicator shall be that of the FIR concerned. When an aerodrome is situated within an overlying FIR of another State, the first field of Item (Q) shall contain the code for that overlying FIR; or
- (ii) where the subject of the information is located geographically with more than one FIR, the FIR field shall be composed of the ICAO nationality letters of the State originating the NOTAM followed by "XX". The ICAO location indicators of the FIRs concerned shall then be listed in Item (A) or indicator of the State or non-governmental agency which is responsible for provision of air navigation service in more than one State;

(*b*) NOTAM CODE:

All NOTAM Code groups contain a total of five (5) letters and the first letter is always the letter Q. The second and third letters identify the subject, and the fourth and fifth letters denote the status or condition of the subject reported upon. The two-letter codes for subjects and conditions are those contained in the PANS-ABC (DOC 8400). For combinations of second and third and fourth and fifth letters, the NOTAM Selection Criteria contained in Doc 8126 or insert one (1) of the following combinations, as appropriate —

- (i) If the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert "XX" as the second and third letters (e.g. QXXAK);
- (ii) If the condition of the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert "XX" as the fourth and fifth letters (e.g. QFAXX);
- (iii) Where a NOTAM containing operationally significant information is issued in accordance with Schedules 12 and 13, and when it is used to announce existence of AIRAC AIP Amendments or Supplements, insert "TT" as the fourth and fifth letters of the NOTAM Code;
- (iv) Where a NOTAM is issued containing a checklist of valid NOTAM, insert "KKKK" as the second, third, fourth and fifth letters; and
- (v) The following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:

AK: RESUMED NORMAL OPERATION

AL: OPERATIVE OR RE-OPERATIVE SUBJECT TO PREVIOUSLY PUB-LISHED LIMITATIONS OR CONDITIONS

AO: OPERATIONAL

CC: COMPLETED

CN: CANCELLED

HV: WORK COMPLETED

XX: PLAIN LANGUAGE

(c) TRAFFIC

I = IFR

V = VFR

K = NOTAM is a checklist

- Note.—Depending on the NOTAM subject and content, the qualifier field TRAFFIC may contain combined qualifiers. Guidance concerning the combination of TRAFFIC qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in Doc 8126.
 - (d) PURPOSE
 - N = NOTAM selected for the immediate attention of air-craft operators
 - B = NOTAM selected for PIB entry
 - O = NOTAM concerning flight operations
 - M = Miscellaneous NOTAM; not subject for a briefing, but it is available on Request
 - K = NOTAM is a checklist
 - Note.— Depending on the NOTAM subject and content, the qualifier field PURPOSE may contain the combined qualifiers BO or NBO. Guidance concerning the combination of PURPOSE qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in Doc 8126.

(e) SCOPE

- A = Aerodrome
- E = En route
- W= Nav Warning

K = NOTAM is a checklist

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

(f) LOWER AND UPPER

LOWER and UPPER limits shall only be expressed in flight levels (FL) and shall express the actual vertical limits of the area of influence with the addition of buffers. In the case of navigation warnings and airspace restrictions, values entered shall be consistent with those provided under Items F and G. Where the subject does not contain specific height information, insert "000" for LOWER and "999" for UPPER as default values.

(g) COORDINATES, RADIUS

The latitude and longitude accurate to one minute, as well as a three (3) digit distance figure giving the radius of influence in NM (e.g. 4700N01140E043). Coordinates present approximate centre of circle whose radius encompasses the whole area of influence, and if the NOTAM affects the entire FIR, enter the default value "999" for radius.

4. Item A

Insert the location indicator as contained in ICAO Doc 7910 of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one (1) FIR or IR may be indicated when appropriate. If there is no available ICAO location indicator, use the ICAO nationality letter as given in ICAO Doc 7910, Part 2, plus "XX" and followed up in Item E by the name, in plain language. If information concerns GNSS, insert the appropriate ICAO location indicator allocated for a GNSS element or the common location indicator allocated for all elements of GNSS (except GBAS).

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

5. Item B

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

6. Item C

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

7. Item D

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

Note: Guidance concerning a harmonised definition of Item (D) content is provided in Doc 8126.

8. Item E

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

9. Items F and G

These items are normally applicable to navigation warnings or air-space restrictions and are usually part of the PIB entry. Insert both lower and upper height limits of activities or restrictions, clearly indicating only one (1) reference datum and unit of measurement. The abbreviations GND or SFC shall be used in Item F to designate ground and surface respectively. The abbreviation UNL shall be used in Item G to designate unlimited.

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

SCHEDULE 14

INFORMATION TO BE NOTIFIED BY AIRAC

[Schedule 8, Part D]

PART 1

1. The AIRAC shall provide information on the establishment and withdrawal of, and premeditated significant changes including operational trials as follows:

- (*a*) horizontal and vertical limits and regulations and procedures applicable to—
 - (i) flight information regions;
 - (ii) control areas;
 - (iii) control zones;
 - (iv) advisory areas;
 - (v) ATS routes;
 - (vi) permanent danger, prohibited and restricted areas (including type and periods of activity when known) and ADIZ;
 - (vii) permanent areas or routes or portions thereof where the possibility of interception exists;
- (*b*) positions, frequencies, call signs, identifiers, known irregularities and maintenance periods of radio navigation aids, communication and surveillance facilities;
- (c) holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures; and
- (*d*) transition levels, transition altitudes and minimum sector altitudes;
- (e) meteorological facilities including broadcasts and procedures; and
- (*f*) runways and stopways;
- (g) taxiways and aprons;

- (*h*) aerodrome ground operating procedures including low visibility procedures;
- (*i*) approach and runway lighting; and
- (*j*) aerodrome operating minima, where published by a State.

PART 2

2. The AIRAC shall provide information on the establishment and withdrawal of, and premeditated significant changes to –

- (a) position, height and lighting of navigational obstacles;
- (b) hours of service: aerodromes, facilities and services;
- (c) customs, immigration and health services;
- (*d*) temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft; and
- *(e)* temporary areas or routes or portions thereof where the possibility of interception exists.

PART 3

- 3. The establishment of, and premeditated major changes to -
 - (a) New aerodromes for international IFR operations;
 - (b) New runways for IFR operations at international aerodromes;
 - (c) Design and structure of the air traffic services route net-work;
 - (*d*) Design and structure of a set of terminal procedures including change of procedure bearings due to magnetic variation change; and
 - *(e)* Circumstances listed in Part 1 where the entire State or any significant portion thereof is affected or where cross-border coordination is required.

SCHEDULE 15

TERRAIN AND OBSTACLE DATA REQUIREMENTS

(Schedule 8, Part H)



Figure 1. Terrain Data Collection Surfaces - Area 1 and Area 2

1. Within the area covered by a 10-km radius from the ARP, terrain data shall comply with the Area 2 numeric requirements.

2. In the area between ten kilometres (10 km) and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plan one hundred and twenty metres (120 m) above the lowest runway elevation shall comply with the Area 2 numerical requirements.

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

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

Note: Terrain data numerical requirements for Areas 1 and 2 are specified in Table 1 of this Schedule.



Figure 2. Obstacle Data Collection Surfaces – Area 1 and Area 2

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in Table 2 of this Schedule:

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

- b) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15% to each side. The Area 2b obstacle collection surface has a 1.2% slope extending from the ends of Area 2a at the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15% to each side. Obstacles less than 3 m in height above ground need not be collected;
- c) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c shall be the elevation of the point of Area 2a at which it commences. Obstacles less than 15 m in height above ground need not be collected; and
- d) d) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing TMA boundary whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground.

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

3. Data on every obstacle within Area 1 whose height above the ground is one hundred metres (100 m) or higher shall be collected and recorded in the database in accordance with the Area 1 numerical requirements specified in Table 2.


Figure 3. Terrain and Obstacle Data Collection Surface – Area 3

1. The data collection surface for terrain and obstacles extends a halfmetre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.

2. Terrain and obstacle data in Area 3 shall comply with the numerical requirements specified in Table 1 and Table 2 of this Schedule, respectively.



Figure 4. Terrain and Obstacle Data Collection Surface – Area 4

Terrain data in Area 4 shall comply with the numerical requirements specified in Table 1.

Table 1 – Terrain Data Numerical Requirements

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

Table 2 – Obstacle Data Numerical Requirements

| | Area 1 | Area 2 | Area 3 | Area 4 |
|--------------------------|-------------|-------------|-------------|-------------|
| Vertical accuracy | 30 m | 3 m | 0.5 m | 1 m |
| Vertical resolution | 1 m | 0.1 m | 0.01 m | 0.1 m |
| Horizontal accuracy | 50 m | 5 m | 0.5 m | 2.5 m |
| Confidence level | 90% | 90% | 90% | 90% |
| Integrity classification | routine | essential | essential | essential |
| Maintenance period | as required | as required | as required | as required |

Table 3 – Terrain Attributes

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

Table 4 – Obstacle Attributes

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

SCHEDULE 16

PRINCIPLES GOVERNING AERONAUTICAL CHARTS

(Regulation 46)

PART A

The following are the standards required to be met in respect of charts:

Operational Requirements for Charts

1. (1) Each type of chart shall be designed observing Human Factors principles which facilitate its optimum use and contain information relevant to the function of the chart.

(2) Each type of chart shall provide information appropriate to the phase of flight to ensure the safe and expeditious operation of the aircraft.

(3) The information and its presentation shall be accurate, free from distortion and clutter, unambiguous, and be readable under all normal operating conditions.

(4) Colours or tints and type size used shall be such that the chart can be easily read and interpreted by the pilot in varying conditions of natural and artificial light.

(5) The information on the chart shall be in a form which enables the pilot to acquire the information in a reasonable time consistent with workload and operating conditions.

(6) The information and its presentation on each type of chart shall permit smooth transition from chart to chart as appropriate to the phase of flight.

(7) The charts shall be True North orientated.

(8) The basic sheet size of the charts shall be 210 x 148 mm (8.27 x 5.82 in) (A5).

Titles

2. The title of a chart or chart series prepared in accordance with the specifications contained in this Schedule and intended to satisfy the function of the chart, shall be that of the relevant Part heading as modified by application of any Standard contained in that Part, except that such title shall not include

"ICAO" unless the chart conforms with all Standards specified in this Part and any specified for the particular chart.

Miscellaneous Information

3. (1) The marginal note layout shall be as given in Schedule 17, except as otherwise specified for a particular chart.

(2) The following information shall be shown on the face of each chart unless otherwise stated in the specification of the chart concerned:

- (*a*) designation or title of the chart series;
- (*b*) name and reference of the sheet; and
- (*c*) on each margin an indication of the adjoining sheet, where applicable.

(3) A legend to the symbols and abbreviations used shall be provided on the face or reverse of each chart except that, where it is impracticable for reasons of space, a legend may be published separately.

(4) The name and adequate address of the producing agency shall be shown in the margin of the chart except that, where the chart is published as part of an aeronautical document, this information may be placed in the front of that document.

Note: The title may be abbreviated.

Symbols

4. (1) Symbols used shall conform to those shown in Schedule 18, except that where it is desired to show on an aeronautical chart special features or items of importance to civil aviation for which no ICAO symbol is at present provided, any appropriate symbol may be chosen for this purpose, provided that it does not cause confusion with any existing ICAO chart symbol or impair the legibility of the chart.

(2) To represent ground-based navigation aids, intersections and waypoints, the same basic symbol shall be used on all charts on which they appear, regardless of chart purpose.

(3) The symbol used for significant points shall be based on a hierarchy of symbols and selected in the following order: ground-based navigation aid, intersection, waypoint symbol. A waypoint symbol shall be used only when a

particular significant point does not already exist as either a ground-based navigation aid or intersection.

(4) Effective 18 November 2010, symbols shall be shown in the manner specified in sub-clauses (2), (3) and Schedule 18 — ICAO Chart Symbols, symbol number 121.

Note. — The size and prominence of symbols and the thickness and spacing of lines may be varied according to the scale and functions of the chart, with due regard to the importance of the information they convey.

Units of Measurement

5. (1) Distances shall be –

- (*a*) derived as geodesic distances; and
- (*b*) expressed in kilometres, nautical miles or both, provided the units are clearly differentiated.
- (2) Altitudes, elevations and heights shall be expressed in feet.

(3) Linear dimensions on aerodromes and short distances shall be expressed in metres.

(4) The order of resolution of distances, dimensions, elevations and heights shall be that as specified for a particular chart.

(5) The units of measurement used to express distances, altitudes, elevations and heights shall be conspicuously stated on the face of each chart.

(6) Conversion scales such as kilometres to nautical miles or metres to feet and vice versa shall be—

- (*a*) provided on each chart on which distances, elevations or altitudes are shown; and
- (*b*) placed on the face of each chart.

Scale and Projection

6. For charts of -

(*a*) large areas, the name and basic parameters and scale of the projection shall be indicated; and

(b) of small areas, a linear scale only shall be indicated.

Date of Validity of Aeronautical Information

7. The date of validity of aeronautical information shall be clearly indicated on the face of each chart.

Spelling of Geographical Names

8. (1) The symbols of the Roman alphabet shall be used for all writing.

(2) Where a geographical term such as cape, point, gulf or river, is abbreviated on any particular chart, that word shall be spelt out in full in the language used by the publishing agency, in respect of the most important example of each type.

(3) Punctuation marks shall not be used in abbreviations within the body of a chart.

(4) In areas where romanised names have not been officially produced or adopted, and outside the territory of Contracting States, names shall be transliterated from the non-Roman alphabet form by the system generally used by the producing agency.

Abbreviations

9. (1) Abbreviations shall be used on aeronautical charts where they are appropriate.

(2) Where applicable, abbreviations shall be selected from the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (Doc 8400).

Political Boundaries

10. (1) International boundaries shall be shown, but may be interrupted if data more important to the use of the chart would be obscured.

(2) Where the territory of more than one (1) State appears on a chart, the names identifying the countries shall be indicated.

Colours

11. Colours used on charts shall conform to Schedule 19 – Colour Guide.

Relief

12. (1) Relief, where shown, shall be portrayed in a manner that will satisfy the chart users' need for—

- (*a*) orientation and identification;
- (*b*) safe terrain clearance;
- (c) clarity of aeronautical information when shown; and
- (d) planning.
- Note.— Relief is usually portrayed by combinations of contours, hypsometric tints, spot elevations and hill shading, the choice of method being affected by the nature and scale of the chart and its intended use.

(2) Where relief is shown by hypsometric tints, the tints used shall be based on those shown in the Hypsometric Tint Guide in Schedule 20.

(3) Where spot elevations are used they shall be shown for selected critical points.

(4) The value of spot elevations of doubtful accuracy shall be followed by the sign " \pm ".

Prohibited, Restricted and Danger Areas

13. When prohibited, restricted or danger areas are shown, the reference or other identification shall be included, except that the nationality letters may be omitted.

Air Traffic Services Airspaces

14. (1) Where ATS airspace is shown on a chart, the class of airspace, the type, name or call sign, the vertical limits and the radio frequency to be used shall be indicated and the horizontal limits depicted in accordance with Schedule 18.

(2) On charts used for visual flight, those parts of the ATS Airspace Classes table (Appendix 4) in Annex 11 applicable to the airspace depicted on the chart shall be on the face or reverse of each chart.

Magnetic Variation

15. (1) True North and magnetic variation shall be indicated and the order of resolution of magnetic variation shall be as specified for the particular chart.

(2) When magnetic variation is shown on a chart, the values shown shall be those for the year nearest to the date of publication that is divisible by 5, i.e. 1980, 1985, etc. In exceptional cases where the current value would be more than one (1) degree different, after applying the calculation for annual change, an interim date and value shall be quoted.

Note. — The date and the annual change may be shown.

(3) For instrument procedure charts, the publication of a magnetic variation change shall be completed within a maximum of six (6) AIRAC cycles.

(4) In large terminal areas with multiple aerodromes, a single rounded value of magnetic variation shall be applied so that the procedures that service multiple aerodromes use a single, common variation value.

Aeronautical Data

16. (1) The Director General shall take all necessary measures to introduce a properly organised quality system containing procedures, processes and resources necessary to implement quality management at each function stage as outlined in clause 8 of Part A in Schedule 8.

(2) The execution of quality management under sub-clause (1), shall be made demonstrable for each function stage, where required.

(3) The Director General shall ensure that established procedures exist in order that aeronautical data at any moment is traceable to its origin to allow any data anomalies or errors, detected during the production or maintenance phases or in the operational use, to be corrected.

(4) The Director General shall ensure that the order of chart resolution of aeronautical data shall be that as specified for a particular chart and as presented in a tabular form in Schedule 22.

(5) The Director General shall ensure that integrity of aeronautical data is maintained throughout the data process from survey or origin to the next intended user.

(6) Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which

the data item is put and, the following classification and data integrity level shall apply:

- (*a*) 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 thorough analysis of the overall system architecture as potential data integrity risks.
- (*b*) for essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and
- (c) for routine data: avoid corruption throughout the processing of the data;

(7) Aeronautical data quality requirements related to the integrity and data classification shall be as provided in Tables 1 to 5 in Schedule 22.

(8) Electronic aeronautical data sets shall be protected by the inclusion in the data sets of a 32-bit cyclic redundancy check implemented by the application dealing with the data sets and shall apply to the protection of all integrity levels of data sets specified in sub-clause (6).

Common Reference Systems

17. (1) The Horizontal reference system shall meet the following standards:

- (*a*) World Geodetic System 1984 (WGS-84) shall be used as the horizontal geodetic reference system;
- (*b*) Published aeronautical geographical coordinates indicating latitude and longitude shall be expressed in terms of the WGS-84 geodetic reference datum;
- (c) geographical coordinates which have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in Part A of Schedule 1, Volumes I and II, shall be identified by an asterisk; and
- (*d*) the order of chart resolution of geographical coordinates shall be that specified for a particular chart series and in accordance with Table 1 of Schedule 22.

(2) The vertical reference system shall meet the following standards:

- (a) mean sea level datum, which gives the relationship of gravityrelated height or elevation to a surface known as the geoid, shall be used as the vertical reference system;
- (b) in addition to the elevations referenced to mean sea level, for the specific surveyed ground positions, geoid undulation referenced to the WGS-84 ellipsoid for those positions shall also be published as specified for a particular chart; and
- (*c*) the order of chart resolution of elevation and geoid undulation shall be that specified for a particular chart series and in accordance with Table 2 of Schedule 22.
- Note 1. The geoid globally most closely approximates MSL. It is defined as the equipotential surface in the gravity field of the Earth that coincides with the undisturbed MSL extended continuously through the continents.
- Note 2. Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

(3) The temporal reference system shall meet the following standards:

- (*a*) the Gregorian calendar and UTC shall be used as the temporal reference system; and.
- (*b*) where a different temporal reference system is used for charting, this shall be indicated in GEN 2.1.2 of the AIP.

PART B

(Regulation 49)

AERODROME OBSTACLE CHART—ICAO TYPE A, OPERATING LIMITATIONS

The Standards required for Aerodrome, Obstacle Chart–ICAO Type A, Operating limitations are as follows:

Units of Measurement

1. (1) Elevations shall be shown to the nearest foot.

(2) Linear dimensions shall be shown to the nearest half-metre.

Coverage and Scale

2. (1) The extent of each plan view shall be sufficient to cover all obstacles.

(2) The horizontal scale shall be within the range of 1:10 000 to 1:15 000.

(3) The vertical scale shall be ten (10) times the horizontal scale.

(4) Horizontal and vertical linear scales showing both metres and feet shall be included on an ICAO Type A chart.

Format

3. (1) An ICAO Type A chart shall depict a plan and profile of each runway, any associated stopway or clearway, the take-off flight path area and obstacles.

(2) The profile for each runway, stopway, clearway and the obstacles in the take-off flight path area shall be shown above its corresponding plan.

(3) The profile of an alternative take-off flight path area shall comprise a linear projection of the full take-off flight path and shall be disposed above its corresponding plan in the manner most suited to the ready interpretation of the information.

(4) A profile grid shall be ruled over the entire profile area exclusive of the runway.

(5) The zero for vertical coordinates shall be mean sea level.

(6) The zero for horizontal coordinates shall be the end of the runway furthest from the take-off flight path area concerned.

(7) Graduation marks indicating the subdivisions of intervals shall be shown along the base of the grid and along the vertical margins.

(8) The vertical grid shall have intervals of 30 m (100 ft) and the horizontal grid shall have intervals of 300 m (1 000 ft).

(9) The chart shall include:

a. a box for recording the operational data specified in 6 below;

b. a box for recording amendments and dates thereof.

Identification

4. A chart shall be identified by -

- (a) the name of the country in which the aerodrome is located;
- (b) the name of the city or town, or area, which the aerodrome serves;
- (c) the name of the aerodrome and the designator of the runway.

Magnetic Variation

5. The magnetic variation to the nearest degree and date of information shall be indicated.

Aeronautical Data

6. (1) The following are standards for representing obstacles on a chart:

- (a) objects in the take-off flight path area which project above a plane surface having a 1.2 percent (1.2%) slope and having a common origin with the take-off flight path area, shall be regarded as obstacles, except that obstacles lying wholly below the shadow of other obstacles as defined in paragraph (*c*) need not be shown;
- (b) mobile objects such as boats, trains and trucks, which may project above the 1.2 percent (1.2%) plane, shall be considered obstacles but shall not be considered as being capable of creating a shadow;
- (c) the shadow of an obstacle is considered to be a plane surface originating at a horizontal line passing through the top of the obstacle at right angles to the centre line of the take-off flight path area;
- (*d*) the plane surface under (*c*) covers the complete width of the take-off flight path area and extends to the plane surface defined in paragraph (*a*) or to the next higher obstacle if it occurs first;
- (e) for the first three hundred metres (300 m) or one thousand feet (1,000 ft) of the take-off flight path area, the shadow

planes are horizontal and beyond this point such planes have an upward slope of 1.2 percent (1.2%); and

(*f*) where the obstacle creating a shadow is likely to be removed, objects that would become obstacles by its removal shall be shown.

(2) Take-off flight path area shall consist of a quadrilateral area on the surface of the earth lying directly below, and symmetrically disposed about, the take-off flight path and shall have the following characteristics:

- (a) the take-off flight path area shall commence at the end of the area declared suitable for take-off (i.e. at the end of the runway or clearway as appropriate);
- (b) the take-off flight path area shall have its width at the point of origin as 180 m (600 ft) and this width increases at the rate of 0.25D to a maximum of 1800 m (6,000 ft), where D is the distance from the point of origin; and
- (*c*) the take-off flight path area shall extend to the point beyond which no obstacles exist or to a distance of 10.0 km (5.4 NM), whichever is the lesser.

(3) For runways serving aircraft having operating limitations which do not preclude the use of a take-off flight path gradient of less than 1.2 percent (1.2%), the extent of the take-off flight path area specified in sub-clause (2) (*c*) shall be increased to not less than 12.0km (6.5 NM) and the slope of the plane surface specified in sub-clause (1) (*a*) through (*e*) shall be reduced to 1.0 percent (1.0%) or less.

(4) The following information on declared distances for each direction of each runway shall be entered in the space provided:

- (*a*) take-off run available;
- (*b*) accelerate-stop distance available;
- (c) take-off distance available; and
- (*d*) landing distance available.
- (e) Where a declared distance is not provided because a runway is usable in one direction only, that runway shall be identified as "not usable for take-off, landing or both"
- (5) A plan view shall include -

- (*a*) an outline of the runway identified by a solid line, including the length and width, the magnetic bearing to the nearest degree and the runway number;
- (*b*) an outline of the clearways shown by a broken line, including the length and identification as such;
- (c) take-off flight path areas shown by a dashed line and the centre line shown by a fine line consisting of short and long dashes;
- (d) alternative take-off flight path areas. When alternative take-off flight path areas not centered on the extension of the runway centre line are shown, notes shall be provided explaining the significance of such areas;
- (e) obstacles, including:
 - 1. the exact location of each obstacle together with a symbol indicative of its type;
 - 2. the elevation and identification of each obstacle;
 - 3. the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.
- (f) alternative take-off flight path areas; and
- (g) indication of the length of each stopway when stopways are shown.

(6) The nature of the runway and stopway surfaces shall be indicated.

(7) Stopways shall be identified as such and shall be shown by a broken line.

(8) When stopways are shown, the length of each stopway shall be indicated.

(9) A profile view shall include –

- (*a*) a profile of the centre line of the runway identified by a solid line and the profile of the centre line of any associated stopways and clearways identified by a broken line;
- (b) an elevation of the runway centre line –

- (i) at each end of the runway, at the stopway and at the origin of each take-off flight path area;
- (ii) wherever there is significant change in slope of runway and stopway; and
- (*c*) the following information in respect of obstacles:
 - each obstacle shown by a solid vertical line extending from a convenient grid line over at least one other grid line to the elevation of the top of the obstacle;
 - (ii) identification of each obstacle;
 - (iii) the limits of penetration of obstacles of large extent in a distinctive manner identified in the legend.
- Note.— An obstacle profile consisting of a line joining the tops of each obstacle and representing the shadow created by successive obstacles may be shown.

Accuracy

7. (1) The order of accuracy attained shall be shown on the chart.

(2) Where no accurate datum for vertical reference is available, the elevation of the datum used shall be stated and shall be identified as assumed.

(3) The horizontal dimensions and the elevations of the runway, stopway and clearway to be printed on the chart shall be determined to the nearest 0.5 m (1 ft).

(4) The order of accuracy of the field work and the precision of chart production shall be such that measurements in the take-off flight path areas can be taken from the chart within the following maximum deviations:

- *a.* horizontal distances: 5 m (15 ft) at a point of origin increasing at a rate of 1 per 500;
- *b.* vertical distances: 0.5 m (1.5 ft) in the first 300 m (1 000ft) and increasing at a rate of 1 per 1 000.

(Regulation 50)

EN ROUTE CHART–ICAO

The standards required for *En route* Charts-ICAO are as follows:

Coverage and Scale

1. (1) *En route* charts shall have adequate overlap to ensure continuity of navigation and where adjacent charts showing a continuous route structure are used, a large variation of scale between charts shall be avoided.

- Note 1. A uniform scale for charts of this type cannot be specified due to the varying degree of congestion of information in certain areas.
- Note 2. (1) A linear scale based on the mean scale of the chart may be shown.

(2) Layout of sheet lines shall be determined by the density and pattern of the ATS route structure.

Projection

2. (1) Parallels and meridians shall be shown at suitable intervals and graduation marks shall be placed at consistent intervals along selected parallels and meridians.

(2) A conformal projection on which a straight line approximates a great circle shall be used.

Identification

3. Each sheet of the chart shall be identified by chart series and number.

Culture and Topography

4. (1) Generalised shore lines of all open water areas, large lakes and rivers shall be shown on the chart except where there would be conflict with data more applicable to the function of the chart.

(2) The area minimum altitude shall be shown on the chart, within each quadrilateral formed by the parallels and meridians.

(3) Where charts are not True North orientated, this fact and the selected orientation used shall be clearly indicated.

(4) In areas of high latitude where it is determined by the Authority that True North orientation of the chart is impractical, the area minimum altitude shall be shown within each quadrilateral formed by reference lines of the graticule (grid) used.

Magnetic Variation

5. Isogonals shall be indicated and the date of the isogonic information given.

Bearings, Tracks and Radials

6. (1) Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, such as 290° (294.9°T).

(2) In areas of high latitude where it is determined by the Authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodromes

7. All aerodromes used for international civil aviation to which an instrument approach can be made shall be shown.

Aeronautical Data for Prohibited, Restricted and Danger Areas

8. Prohibited, restricted and danger areas relevant to the layer of airspace shall be depicted with their identification and vertical limits.

Aeronautical Data for Air Traffic System

9. (1) Where appropriate, the components of the established air traffic services system shall be shown.

(2) The components under sub-clause (1) shall include the following:

(a) the names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds of all radio navigation aids associated with the air traffic services system;

- (*b*) where there is a DME under paragraph (*a*), additionally the elevation of the transmitting antenna of the DME to the nearest 30 m or 100 feet;
- (c) an indication of all designated airspace, including lateral and vertical limits and the appropriate class of airspace;
- (*d*) all air traffic service routes for *en route* flight including route designators, the track to the nearest degree in both directions along each segment of the routes and, where established, the designation of the navigation specification(s) including any limitations and the direction of traffic flow;
- (e) name-codes and geographical coordinates in degrees, minutes and seconds of all significant points which define the ATS routes and which are not marked by the position of a radio navigation aid;
- (f) for waypoints defining VOR and
 - the station identification and radio frequency of the reference VOR/DME navigation routes and DME; and
 - (ii) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre or tenth of a nautical mile from the reference VOR or DME, where the waypoint is not collocated with the VOR or DME;
- (g) an indication of all compulsory and "on-request" reporting points and ATS and MET reporting points;
- (*h*) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
- (i) change-over points on route segments defined by reference to VOR indicating the distances to the nearest kilometre or nautical mile to the navigation aids;
- (*j*) minimum *en route* altitudes and minimum obstacle clearance altitudes on ATS routes to the nearest higher one hundred feet (100 ft) as provided in clause 26 of Part A to Schedule 1;

- (*k*) communication facilities listed with their channels and, where applicable, logon address; and
- (*l*) air defence identification zone (ADIZ) properly identified.

Supplementary Information to Aeronautical Data

10.(1) Details of departure and arrival routes and associated holding patterns in terminal areas shall be shown on an *en route* chart unless the de-tails are shown on an Area Chart, a Standard Departure Chart—Instrument (SID)—ICAO or a Standard Arrival Chart—Instrument (STAR)—ICAO.

(2) Altimeter setting regions shall be shown and identified where established.

PART D

(Regulation 51)

AREA CHART-ICAO

The standards required for Area Charts–ICAO are as follows:

Coverage and Scale

1. (1) The coverage of each chart shall extend to points that effectively show departure and arrival routes.

(2) The chart shall be drawn to scale and a scale-bar shown.

Projection

2. (1) Parallels and meridians shall be shown at suitable intervals with graduation marks placed at consistent intervals along the neat lines, as appropriate.

(2) A conformal projection on which a straight line approximates a great circle shall be used.

Identification

3. The chart shall be identified by a name associated with the airspace portrayed.

Culture and Topography

4. (1) Generalised shorelines of all open water areas, large lakes and rivers shall be shown on a chart except where there would be conflict with data more applicable to the function of the chart.

(2) To improve situational awareness in areas where significant relief exists, all relief exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall be shown printed in black. Obstacles shall also be shown.

- Note 1. The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the elevation of the primary aerodrome may be selected to start layer tinting.
- Note 2.— An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Schedule 19 Colour Guide for contours and topographic features.
- Note 3. —Appropriate spot elevations and obstacles are those provided by the procedures specialist.

Magnetic Variation

5. The average magnetic variation of the area covered by the chart shall be shown to the nearest degree.

Bearings, Tracks and Radials

6. (1) Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, such as 290° (294.9°T).

(2) In areas of high latitude, where it is determined by the Authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodrome

7. All aerodromes which affect the terminal routings shall be shown and where appropriate a runway pattern symbol shall be used.

Aeronautical Data for Prohibited, Restricted and Danger Areas

8. Prohibited, restricted and danger areas shall be depicted with the associated identification and vertical limits.

Aeronautical Data for area Minimum Altitudes

9. Area minimum altitudes shall be shown within quadrilaterals formed by the parallels and meridians.

Aeronautical Data for Air Traffic Services System

10. The components of the established relevant ATS system shall be shown which shall include the following:

- (a) the names, identifications, frequencies and geographical coordinates in degrees, minutes and seconds of all radio navigation aids associated with the ATS system;
- (*b*) where there is a DME, under paragraph (*a*), the elevation of the transmitting antenna of the DME, to the nearest one hundred feet (100 ft);
- (*c*) terminal radio aids which are required for outbound and inbound traffic and for holding patterns;
- (*d*) the lateral and vertical limits of all designated airspace and the appropriate class of airspace;
- (*e*) the designation of the navigation specification(s) including any limitations, where established;
- (f) holding patterns and terminal routings, together with the route designators, and the track to the nearest degree along each segment of the prescribed airways and terminal routings;
- (g) name-codes and geographical coordinates in degrees, minutes and seconds of all significant points which define the

terminal routings and are not marked by the position of a radio navigation aid;

- (*h*) for waypoints defining VOR and DME area navigation routes:
 - (i) the station identification and radio frequency of the reference VOR and DME; and
 - (ii) the bearing to the nearest tenth of a degree and the distance to the nearest two-tenths of a kilometre or one-tenth of a nautical mile from the reference VOR and DME, where the way-point is not collocated with the VOR or DME;
- (i) an indication of all compulsory and "on-request" reporting points;
- (*j*) the distances to the nearest kilometre or nautical mile between significant points constituting turning points or reporting points;
- (k) change-over points on route segments defined by reference to VOR, indicating the distances to the nearest kilometre or nautical mile to the radio navigation aids;
- (*l*) minimum *en route* altitudes and minimum obstacle clearance altitudes on ATS routes to the nearest higher one hundred feet (100 ft) as provided in clause 26 of Part A in Schedule 1;
- (*m*) established minimum vectoring altitudes to the nearest higher one hundred feet (100 ft), clearly identified;
- (*n*) area, speed and level or altitude restrictions where established;
- (*o*) communication facilities listed with their channels and, if applicable, log on address; and
- (*p*) an indication of 'flyover' significant points.

PART E

(Regulation 52)

STANDARD DEPARTURE CHART-INSTRUMENT (SID)-ICAO

The standards required to be met on Standard Departure Charts—Instrument (SID)—ICAO are as follows:

Coverage and Scale

1. (1) The coverage of a chart shall be sufficient to indicate the point where the departure route begins and the specified significant point at which the *en route* phase of flight along a designated ATS route can be commenced.

(2) The chart shall be drawn to scale.

(3) If a chart is drawn to scale, a scale-bar shall be shown.

(4) When a chart is not drawn to scale the annotation "NOT TO SCALE" shall be shown and the symbol for scale-break used on tracks and other aspects of the chart which are too large to be drawn to scale.

Note. — The departure route normally originates at the end of a runway.

Projection

2. (1) Graduation marks shall be placed at consistent intervals along the neat lines.

(2) A conformal projection on which a straight line approximates a great circle shall be used.

(3) When the chart is drawn to scale, parallels and meridians shall be shown at suitable intervals.

Identification

3. A chart shall be identified by –

- (*a*) the name of the city or town, or area, which the aerodrome serves;
- (*b*) the name of the aerodrome; and
- (c) the identification of the standard departure route instrument as established in accordance with the ICAO Procedures for Air Navigation Services Doc 8168, Volume II, Part II, Chapter 5.

Culture and Topography

4. (1) Where a chart is drawn to scale, generalised shore lines of all open water areas, large lakes and rivers shall be shown except where there is conflict with data more applicable to the function of the chart.

(2) To improve situational awareness in areas where significant relief exists, the chart shall be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall be shown printed in black. Obstacles shall also be shown.

- Note 1. The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the aerodrome elevation may be selected to start layer tinting.
- Note 2.— An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Schedule 19 Colour Guide for contours and topographic features.
- Note 3. —Appropriate spot elevations and obstacles are those provided by the procedures specialist.

Magnetic Variation

5. Magnetic variation used in determining the magnetic bearings, tracks and radials shall be shown to the nearest degree.

Bearings, Tracks and Radials

6. (1) Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, such as 290° (294.9°T).

Note. - A note to this effect may be included on the chart.

(2) In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodrome

7. (1) The aerodrome of departure shall be shown by the runway pattern symbol.

(2) All aerodromes which affect the designated standard instrument departure route shall be shown and identified and where appropriate the aerodrome runway patterns shall also be shown.

Aeronautical Data for Prohibited, Restricted and Danger Areas

8. Prohibited, restricted and danger areas which may affect the execution of the procedures shall be shown with the associated identification and vertical limits.

Aeronautical Data for Minimum Sector Altitude

9. (1) The established minimum sector altitude, based on a navigation aid associated with the procedure shall be shown with a clear indication of the sector to which it applies.

(2) Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shown within quadrilaterals formed by the parallels and meridians.

(3) Area minimum altitudes under sub-clause (2), shall also be shown in those parts of the chart not covered by the minimum sector altitude.

Aeronautical Data for Air Traffic Services System

10.(1) The components of the established relevant ATS system shall be shown and shall comprise the following:

- (*a*) a graphic portrayal of each standard instrument departure route, including—
 - (i) route designator;
 - (ii) significant points defining the route;
 - (iii) track or radial to the nearest degree along each segment of the route;
 - (iv) distances to the nearest kilometre or nautical mile between significant points;

- (v) minimum obstacle clearance altitudes along the route or route segments and altitudes required by the procedure to the nearest higher one hundred feet (100 ft) and flight level restrictions where established;
- (vi) where the chart is drawn to scale and vectoring on departure is provided, established minimum vectoring altitudes to the nearest higher one hundred feet (100 ft), clearly identified;
- (b) the radio navigation aid associated with the route including
 - (i) plain language name;
 - (ii) identification;
 - (iii) frequency;
 - (iv) geographical coordinates in degrees, minutes and seconds;
 - (v) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest one hundred feet (100 ft);
- (c) the name-codes and geographical coordinates in degrees, minutes and seconds of the significant points not marked by the position of a radio navigation aid, the bearing to the nearest one-tenth of a degree and distance to the nearest twotenths of a kilometre or one-tenth of a nautical mile from the reference radio navigation aid;
- (*d*) applicable holding patterns;
- (e) transition altitude or height to the nearest higher one hundred feet (100 ft);
- (f) the position and height of close-in obstacles which penetrate the obstacle identification surface and a note included where close-in obstacles penetrating the obstacle identification surface exist but which were not considered for the published procedure design gradient;
- (g) area speed restrictions, where established;

- (*h*) the designation of the navigation specification(s) including any limitations, where established;
- (*i*) all compulsory and "on-request" reporting points;
- (j) radio communication procedures, including-
 - (i) call sign of ATS unit;
 - (ii) frequency;
 - (iii) transponder setting, where appropriate; and
- (*k*) an indication of 'flyover' significant points.

(2) A textual description of standard departure route(s) — instrument (SID) and relevant communication failure procedures shall be provided and shall, whenever feasible, be shown on the chart or on the same page which contains the chart.

Aeronautical Database Requirements

11. Appropriate data provided by the procedures specialist to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services – Aircraft Operations (Doc 8168) Volume II, Section 5, Chapter 2, 2.1 on the verso of the chart or as a separate, properly referenced sheet.

PART F

(Regulation 53)

STANDARD ARRIVAL CHART-INSTRUMENT (STAR)-ICAO

The standards required to be met for Standard Arrival Charts—Instrument (STAR)— ICAO are as follows:

Coverage and Scale

1. (1) The coverage of a chart shall be sufficient to indicate the points where the *en route* phase ends and the approach phase begins.

(2) The chart shall be drawn to scale.

(3) If a chart is drawn to scale, a scale-bar shall be shown.

(4) When a chart is not drawn to scale the annotation "NOT TO SCALE" shall be shown and the symbol for scale break shall be used on tracks and other aspects of the chart which are too large to be drawn to scale.

Projection

2. (1) A conformal projection on which a straight line approximates a great circle shall be used.

(2) When the chart is drawn to scale, parallels and meridians shall be shown at suitable intervals.

(3) Graduation marks shall be placed at consistent intervals along the neat lines.

Identification

3. A chart shall be identified by –

- (*a*) the name of the city or town, or area, which the aerodrome serves;
- (*b*) the name of the aerodrome; and
- (c) the identification of the Standard Arrival Route—Instrument as established in accordance with the ICAO Procedures for Air Navigation Services, Doc 8168, Volume II, Part III, Chapter 3.

Culture and Topography

4. (1) Where a chart is drawn to scale, generalised shore lines of all open water areas, large lakes and rivers shall be shown except where there is conflict with data more applicable to the function of the chart.

(2) To improve situational awareness in areas where significant relief exists, the chart shall be drawn to scale and all relief exceeding 300 m (1 000 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall be shown printed in black. Obstacles shall also be shown.

- Note 1. The next higher suitable contour line appearing on base topographic maps exceeding 300 m (1 000 ft) above the aerodrome elevation may be selected to start layer tinting.
- Note 2.— An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Schedule 19 Colour Guide for contours and topographic features.
- Note 3. —Appropriate spot elevations and obstacles are those provided by the procedures specialist.

Magnetic Variation

5. Magnetic variation used in determining the magnetic bearings, tracks and radials shall be shown to the nearest degree.

Bearings, Tracks and Radials

6. (1) Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, such as 290° (294.9°T).

Note. - A note to this effect may be included on the chart.

(2) In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodrome

7.(1) The aerodrome of landing shall be shown by the runway pattern symbol.

(2) All aerodromes which affect the designated standard instrument arrival route shall be shown and identified and where appropriate the aerodrome runway patterns shall be shown.

Aeronautical Data for Prohibited, Restricted and Danger Areas

8. Prohibited, restricted and danger areas which may affect the execution of the procedures shall be shown with the associated identification and vertical limits.

Aeronautical Data for Minimum Sector Altitude

9. (1) The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies.

(2) Where the minimum sector altitude has not been established, the chart shall be drawn to scale and area minimum altitudes shown within quadrilaterals formed by the parallels and meridians.

(3) Area minimum altitudes under sub-clause (2) shall also be shown in those parts of the chart not covered by the minimum sector altitude.

Aeronautical Data for Air Traffic Services System

10. (1) The components of the established relevant ATS system shall be shown and shall comprise the following:

- (*a*) a graphic portrayal of each standard instrument arrival route, including—
 - (i) route designator;
 - (ii) significant points defining the route;
 - (iii) track or radial to the nearest degree along each segment of the route;
 - (iv) distances to the nearest kilometre or nautical mile between significant points;
 - (v) minimum obstacle clearance altitudes along the route or route segments and altitudes required by the procedure to the nearest higher one hundred feet (100 ft) and flight level restrictions where established; and
 - (vi) where the chart is drawn to scale and vectoring on arrival is provided, established minimum vectoring altitudes to the nearest higher one hundred feet (100 ft), clearly identified;
- (b) the radio navigation aid associated with the route including –

- (i) plain language name;
- (ii) identification;
- (iii) frequency;
- (iv) geographical coordinates in degrees, minutes and seconds; and
- (v) for DME, the channel and the elevation of the transmitting antenna of the DME to the nearest one hundred feet (100 ft);
- (c) the name-codes and geographical coordinates in degrees, minutes and seconds of the significant points not marked by the position of a radio navigation aid, the bearing to the nearest one-tenth of a degree and distance to the nearest twotenths of a kilometre or one-tenth of a nautical mile from the reference radio navigation aid;
- (*d*) applicable holding patterns;
- (*e*) transition altitude or height to the nearest higher one thousand feet (1,000 ft);
- (f) area speed restrictions, where established;
- (g) the designation of the navigation specification(s) including any limitations, where established;
- (*h*) all compulsory and "on-request" reporting points;
- (*i*) radio communication procedures, including:
 - (i) call sign of ATS unit;
 - (ii) frequency; and
 - (iii) transponder setting, where appropriate; and
- (*j*) an indication of 'flyover' significant points.

(2) A textual description of standard arrival route(s) — instrument (STAR) and relevant communication failure procedures shall be provided and shall, whenever feasible, be shown on the chart or on the same page which contains the chart.

Aeronautical Database Requirements

11. Appropriate data provided by the procedures specialist to support navigation database coding shall be published in accordance with the Procedures for Air Navigation Services – Aircraft Operations (Doc 8168) Volume II, Section 5, Chapter 2, 2.2 on the verso of the chart or as a separate, properly referenced sheet.

PART G

(Regulation 54)

INSTRUMENT APPROACH CHART–ICAO

The standards required to be met on Instrument Approach Charts—ICAO are as follows:

Coverage and Scale

1. (1) The coverage of a chart shall be sufficient to include all segments of the instrument approach procedure and any additional areas as may be necessary for the type of approach intended.

(2) The scale selected for a chart shall provide for optimum legibility and be consistent with—

- (*a*) the procedure shown on the chart; and
- (b) sheet size.

(3) An indication of the scale selected under sub-clause (2) shall be shown on a chart.

(4) Except where this is not practicable, a distance circle with a radius of twenty kilometres (20 km) or ten nautical miles (10 nm) centered on a DME

located on or close to the aerodrome, or on the aerodrome reference point where no suitable DME is available, shall be shown and its radius indicated on the circumference.

(5) A distance scale shall be shown directly below the profile.

Format

2. The sheet size shall be 210 x 148 mm (8.27 x 5.82 in).

Projection

3. (1) A conformal projection on which a straight line approximates a great circle shall be used.

(2) Graduation marks shall be placed at consistent intervals along the neat lines.

Identification

4. A chart shall be identified by –

- (*a*) the name of the city or town, or area, which the aerodrome serves;
- (*b*) the name of the aerodrome; and
- (c) the identification of the instrument approach procedure as established in accordance with the ICAO Procedures for Air Navigation Services, Doc 8168, Volume II, Part III, Chapter 1.

Culture and Topography

5. (1) Culture and topographic information pertinent to the safe execution instrument approach procedure, including missed approach procedure associated holding patterns and visual manoeuvers or circling procedures when established shall be shown.

(2) The topographic information under sub-clause (1) shall be named, only where necessary to facilitate the understanding of such information.

(3) The minimum topographic information under this clause shall be a delineation of land masses and significant lakes and rivers.

(4) Relief shall be shown in a manner best suited to the particular elevation characteristics of the area.
(5) In areas where relief exceeds one thousand, two hundred metres (1,200 m) or four thousand feet (4,000 ft) above the aerodrome elevation within the coverage of the chart or six hundred metres (600 m) or two thousand feet (2,000 ft) within eleven metres (11 m) or six nautical miles (6 nm) of the aerodrome reference point or where final approach or missed approach procedure gradient is steeper than optimal due to terrain, all relief exceeding one hundred and fifty metres (150 m) or five hundred feet (500 ft) above the aerodrome elevation shall be shown by smoothed contour lines with contour values and layer tints printed in brown.

(6) Appropriate spot elevations, including the highest elevation within each top contour line, shall also be shown printed in black.

(7) In areas where relief is lower than specified in 4, 5 and 6 above, all relief exceeding 150 m (500 ft) above the aerodrome elevation shall be shown by smoothed contour lines, contour values and layer tints printed in brown. Appropriate spot elevations, including the highest elevation within each top contour line, shall also be shown printed in black.

- Note 1. The next higher suitable contour line appearing on base topographic maps exceeding 150 m (500 ft) above the aerodrome elevation may be selected to start layer tinting.
- Note 2.— An appropriate brown colour, on which half-tone layer tinting is to be based, is specified in Schedule 19 Colour Guide for contours and topographic features.
- Note 3. —Appropriate spot elevations are those provided by the procedures specialist.

Magnetic Variation

6. (1) The magnetic variation shall be shown.

(2) Where the value of magnetic variation is used it shall be displayed to the nearest degree and agree with the magnetic variation used in determining magnetic bearings, tracks and radials.

Bearings, Tracks and Radials

7. (1) Bearings, tracks and radials shall be magnetic. Where bearings and tracks are additionally provided as true values for RNAV segments, they shall be shown in parentheses to the nearest tenth of a degree, such as 290° (294.9°T).

(2) In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodromes

8. (1) All aerodromes which show a distinctive pattern from the air shall be shown by the appropriate symbol and abandoned aerodromes shall be identified as abandoned.

(2) The runway pattern shall be shown at a scale sufficiently large to show it clearly.

(3) The runway pattern under sub-clause (1), shall be shown for -

- (a) the aerodrome on which the procedure is based; and
- (*b*) aerodromes affecting the traffic pattern or so situated as to be likely, under adverse weather conditions, to be mistaken for the aerodrome of intended landing.

(4) Aerodrome elevation shall be shown to the nearest foot in a prominent position on the chart.

(5) Threshold elevation or, where applicable, the highest elevation of the touchdown zone shall be shown to the nearest foot.

Aeronautical Data for Obstacles

9. (1) Obstacles shall be shown on the plan view of the chart.

Note. – Appropriate obstacles are those provided by the procedures specialist.

(2) If one or more obstacles are the determining factor of an obstacle clearance altitude/height, those obstacles shall be identified.

(3) The elevation of the top of obstacles shall be shown to the next higher foot.

(4) The heights of obstacles above a datum other than mean sea level (see 3) shall be shown. When shown, they shall be given in parentheses on the chart.

(5) When heights of obstacles above a datum other than mean sea level are shown, the datum shall be the aerodrome elevation except that, at aerodromes having an instrument runway with a threshold elevation more than seven feet (7 ft) below the aerodrome elevation, the chart datum shall be the threshold elevation of the runway to which the instrument approach is related.

(6) Where a datum other than mean sea level is used, it shall be stated in a prominent position on the chart.

(7) Where an obstacle free zone has not been established for a precision approach runway Category I, this shall be indicated.

Aeronautical Data for Prohibited, Restricted and Danger Areas

10. Prohibited, restricted and danger areas which may affect the execution of instrument approach procedures shall be shown with associated identification and vertical limits.

Aeronautical Data for Radio Communication Facilities and Navigation Aids

11. (1) Radio navigation aids required for instrument approach procedures together with associated frequencies, identifications and track-defining characteristics, if any, shall be shown.

(2) For an instrument approach procedure when more than one (1) station is located on the final approach track, the facility to be used for track guidance for final approach shall be clearly identified, and consideration given to the elimination from the approach chart of those facilities that are not used by the procedure.

(3) The initial approach fix (IAF), the intermediate approach fix (IF), the final approach fix (FAF) (or final approach point (FAP) for an ILS approach procedure), the missed approach point (MAPt), where established, and other essential fixes or points comprising the procedure shall be shown and identified.

(4) The final approach fix (or final approach point for an ILS approach procedure) shall be identified with its geographical coordinates in degrees, minutes and seconds.

(5) Radio navigation aids that might be used in diversionary procedures together with associated track-defining characteristics, if any, shall be shown or indicated on the chart.

(6) Radio communication frequencies, including call signs that are required for the execution of the procedures shall be shown.

(7) The distance to the aerodrome from each radio navigation aid concerned with the final approach when required by the instrument approach procedure, shall be shown to the nearest kilometre or nautical mile.

(8) When no track-defining aid indicates the bearing of the aerodrome, the bearing shall also be shown to the nearest degree.

Aeronautical Data for Minimum Sector Altitude or Terminal Arrival Altitude

12. The minimum sector altitude or terminal arrival altitude established by the Authority shall be shown, with a clear indication of the sector to which it applies.

Aeronautical Data for Portrayal of Procedure Tracks

13. (1) The plan view shall show the following:

- (*a*) the approach procedure track by an arrowed continuous line indicating the direction of flight;
- (*b*) the missed approach procedure track by an arrowed broken line;
- (*c*) any additional procedure track, other than those specified in paragraphs (*a*)and (*b*), by an arrowed dotted line;
- (d) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or one-tenth of a nautical mile or times required for the procedure;
- (*e*) where no track-defining aid is available, the magnetic bearing to the nearest degree to the aerodrome from the radio navigation aids concerned with the final approach;
- (*f*) the boundaries of any sector in which visual manoeuvring is prohibited;
- (g) where specified the holding pattern and minimum holding altitude or height associated with the approach and missed approach;

- (*h*) caution notes where required, prominently displayed on the face of the chart; and
- (*i*) an indication of 'flyover' significant points.

(2) The plan view shall show the distance to the aerodrome from each radio navigation aid concerned with the final approach.

(3) A profile shall be provided showing the following:

- (*a*) the aerodrome by a solid block at aerodrome elevation;
- (*b*) the profile of the approach procedure segments by an arrowed continuous line indicating the direction of flight;
- (*c*) the profile of the missed approach procedure segment by an arrowed broken line and a description of the procedure;
- (*d*) the profile of any additional procedure segment, other than those specified in paragraphs (*b*) and (*c*), by an arrowed dotted line;
- (e) bearings, tracks, radials to the nearest degree and distances to the nearest two-tenths of a kilometre or one-tenth of a nautical mile or times required for the procedure;
- (*f*) altitudes or height required by the procedure, including transition altitude and procedure altitudes or heights, where established;
- (g) limiting distance to the nearest kilometre or nautical mile on procedure turn, where specified;
- (*h*) the intermediate approach fix or point, on procedures where no course reversal is authorised; and
- (*i*) a line representing the aerodrome elevation or threshold elevation, as appropriate, extended across the width of the chart including a distance scale with its origin at the runway threshold.

(4) Heights required by procedures shall be shown in parentheses, using the height datum selected in accordance with 8(5) above.

(5) The profile view shall include a ground profile or a minimum altitude/height portrayal as follows:

- (*a*) a ground profile shown by a solid line depicting the highest elevations of the relief occurring within the primary area of the final approach segment. The highest elevations of the relief occurring in the secondary areas of the final approach segment shown by a dashed line; or
- (*b*) minimum altitudes/heights in the intermediate and final approach segments indicated within bounded shaded blocks.
- Note 1. —For the ground profile portrayal, actual templates of the primary and secondary areas of the final approach segment are provided to the cartographer by the procedures specialist.
- Note 2. —The minimum altitude/height portrayal is intended for use on charts depicting non-precision approaches with a final approach fix.

Note: The profile is normally located below the plan view.

Aeronautical Data for Aerodrome Operating Minima

14. (1) Aerodrome operating minima where established shall be shown.

(2) The obstacle clearance altitudes or heights for the aircraft categories for which the procedure is designed shall be shown.

(3) For precision approach procedures, additional OCA/H for Cat DL aircraft [wing span between sixty-five metres (65 m) and eighty metres (80 m) or vertical distance between the flight path of the wheels and the glide path antenna between seven metres (7 m) and eight metres (8 m)] shall be published, when necessary.

Aeronautical Data for Supplementary Information

15. (1) The distance to the nearest two-tenths of a kilometre or one-tenth of a nautical mile and a table showing ground speeds and times from the final approach fix to the missed approach point shall be shown where the missed approach point defined by -

- (*a*) a distance from the final approach fix; or
- (*b*) a facility or a fix and the corresponding distance from the final approach fix.

(2) Where DME is required for use in the final approach segment, a table showing altitude or height for every two kilometres (2 km) or one nautical mile (1 nm), as appropriate, shall be shown.

(3) The table under sub-clause (2), shall not include distances which would correspond to altitude or height below the OCA or OCH.

(4) For procedures in which DME is not required for use in the final approach segment but where a suitably located DME is available to provide advisory descent profile information, a table showing the altitudes/heights shall be included.

(5) A rate of descent table shall be shown.

(6) For non-precision approach procedures with a final approach fix, the final approach descent gradient to the nearest one-tenth of a percent and, in parenthesis, descent angle to the nearest one-tenth of a degree shall be shown.

(7) For precision approach procedures and approach procedures with vertical guidance, the reference datum height to the nearest foot and the glide path, elevation and vertical path angle to the nearest one-tenth of a degree shall be shown.

(8) Where ILS or MLS glide path or elevation angle exceeds 3.5 degrees, a note shall be included referring to appropriate aircraft and flight crew qualification requirements for such a procedure.

(9) When a final approach fix is specified at the final approach point for ILS, a clear indication shall be given whether it applies to the ILS procedure, the associated ILS localiser only procedure, or both.

(10) For MLS, a clear indication shall be given where a final approach fix has been specified at the final approach point.

(11) Where the final approach descent gradient/angle for any type of instrument approach procedure exceeds the maximum value specified in the *Procedures for Air Navigation Services - Aircraft Operations* (PANS-OPS, Doc 8168), Volume II, Part I, Section IV, Chapter 5, a cautionary note shall be included.

Aeronautical Database Requirements

16. Appropriate data provided by a procedures specialist to support navigation database coding shall be published in accordance with the Procedures

for Air Navigation Services – Aircraft Operations (Doc 8168) Volume II, Section 5, Chapter 2, 2.2 on the verso of the chart or as a separate, properly referenced sheet.

PART H

(Regulation 55)

VISUAL APPROACH CHART–ICAO

The standards required to be met for Visual Approach Charts—ICAO are as follows:

Scale

1. (1) The scale shall be sufficiently large to permit depiction of significant features and indication of the aerodrome layout.

(2) The scale shall not be smaller than 1:500 000.

Note. — A scale of 1:250 000 or 1:200 000 is preferred.

(3) When an Instrument Approach Chart is available for a given aerodrome, the Visual Approach Chart shall be drawn to the same scale.

Format

2. The sheet size shall be 210 x 148 mm (8.27 x 5.82 in).

Note. —It would be advantageous to print the charts in several colours, selected to provide maximum legibility in varying degrees and kinds of light.

Projection

3. (1) A conformal projection on which a straight line approximates a great circle shall be used.

(2) Graduation marks shall be placed at consistent intervals along the neat lines.

Identification

4. A chart shall be identified by –

(a) the name of the city or town which the aerodrome serves; and

(*b*) the name of the aerodrome.

Culture and Topography

5. (1) The following shall be shown on a Visual Approach Chart–ICAO:

- (a) natural and cultural landmarks such as bluffs, cliffs, sand dunes, cities, towns, roads, railroads and isolated lighthouses;
- (b) shore lines, lakes, rivers and streams shall be shown; and
- (*c*) relief depicted in a manner best suited to the particular elevation and obstacle characteristics of the area covered by the chart.

(2) Geographical place names shall be included only when they are required to avoid confusion or ambiguity.

- (3) When shown, spot elevations shall be carefully selected.
 - Note. The value of certain spot elevations/heights in relation to both mean sea level and aerodrome elevation may be given.

(4) The figures relating to different reference levels shall be clearly differentiated.

Magnetic Variation

6. The magnetic variation shall be shown.

Bearings, Tracks and Radials

7. (1) Bearings, tracks and radials shall be magnetic.

(2) In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, shall be used.

(3) Where bearings, tracks or radials are given with reference to True North or Grid North, this shall be clearly indicated. When Grid North is used, its reference grid meridian shall be identified.

Aeronautical Data for Aerodromes

8. (1) An aerodrome shall be shown by the runway pattern and abandoned aerodromes shall be identified as abandoned.

(2) Restrictions on the use of any landing direction shall be indicated.

(3) Where the aeronautical data of two (2) or more aerodromes are similar to an extent that would confuse identification one from the other, this shall be indicated.

(4) Aerodrome elevation shall be shown in a prominent position on the chart.

Aeronautical Data for Obstacles

9. (1) Obstacles shall be shown and identified on a chart.

(2) The elevation of the top of obstacles shall be shown to the next higher foot.

(3) The heights of obstacles above the aerodrome elevation shall be shown.

(4) Where the height of an obstacle is shown, the height datum shall be stated in a prominent position on the charts and heights given in parentheses on the chart.

Aeronautical Data for Prohibited, Restricted and Danger Areas

10. Prohibited, restricted and danger areas shall be depicted with associated identification and vertical limits.

Aeronautical Data for Designated Airspace

11. Where applicable, control zones and aerodrome traffic zones shall be depicted with associated vertical limits and the appropriate class of airspace.

Aeronautical Data for Visual Approach Information

12.(1) Visual approach procedures shall be shown on a chart, where applicable.

(2) Visual aids for navigation shall be shown on a chart, where appropriate.

(3) Location and type of the visual approach slope indicator systems shall be shown with associated:

- (*a*) nominal approach slope angle(s);
- (b) minimum eye height(s) over the threshold of the on-slope signal(s); and
- (*c*) the angle and direction of displacement, left or right, where the axis of the system is not parallel to the runway centre line.

Aeronautical Data for Supplementary Information

13.(1) Radio navigation aids together with associated frequencies and identifications shall be shown, where appropriate.

(2) Radio communication facilities with associated frequencies shall be shown, where appropriate.

PART I

(Regulation 56)

AERODROME/HELIPORT CHARTS – ICAO

The standards required to be met on Aerodrome or Heliport Charts—ICAO are as follows:

Coverage and Scale

1. The chart shall use a linear scale which shall in addition to the coverage be sufficiently large to show clearly all the elements listed in sub-clause 4(1).

Identification

2. A chart shall be identified by –

- (*a*) the name of the city or town, or area, which the aerodrome or heliport serves; and
- (*b*) the name of the aerodrome or heliport.

Magnetic Variation

3. True and Magnetic North arrows and magnetic variation to the nearest degree and annual change of magnetic variation shall be shown.

Data for Aerodrome or Heliport

4. (1) The following shall be shown on a chart:

- (*a*) geographical coordinates in degrees, minutes and seconds for the aerodrome or heliport reference point;
- (b) elevations, to the nearest foot, of the aerodrome or heliport and apron altimeter checkpoint locations where applicable and for non-precision approaches, elevation and geoid undulations of runway threshold and the geometric centre of the touchdown and lift-off area;
- (c) elevation and geoid undulation, to the nearest foot—
 - (i) of the precision approach runway threshold;
 - (ii) of the geometric centre of the touchdown and liftoff area; and
 - (iii) at the highest elevation of the touchdown zone of a precision approach runway;
- (d) all runways including those under construction with designation number, length and width to the nearest metre, bearing strength, displaced thresholds, stopways, clearways, runway directions to the nearest degree magnetic, type of surface and runway markings;
- (e) all aprons, with aircraft or helicopter stands, lighting, markings and other visual guidance and control aids, where applicable, including location and type of visual docking guidance systems, type of surface for heliports, and bearing strengths or aircraft type restrictions where the bearing strength is less than that of the associated runways;
- (f) geographical coordinates in degrees, minutes and seconds for threshold, geometric centre of touchdown and lift-off area and threshold of the final approach and take-off area where appropriate;

- (g) all taxiways, helicopter air and ground taxiways with type of surface, helicopter air transit route, with designation, width, lighting, markings, including runway-holding positions and where established, intermediate holding positions stop bars, other visual guidance and control aids, and bearing strength or aircraft type restrictions where the bearing strength is less than that of the associated runways;
- (*h*) where established, hot spot locations with additional information properly annotated;
- (*i*) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for appropriate taxiway centre line point and aircraft stand;
- (*j*) where established, standard routes for taxiing aircraft with associated designators;
- (*k*) the boundaries of the air traffic control service;
- (*l*) position of RVR observation sites;
- (*m*) approach and runway lighting;
- (*n*) location and type of the visual approach slope indicator systems with associated nominal approach slope angle, minimum eye height over the threshold of the on-slope signal, and the angle and direction of the displacement, left or right where the axis of the system is not parallel to the runway centre line;
- (*o*) relevant communication facilities listed with their channels and, where applicable, logon address;
- (*p*) obstacles to taxiing;
- (*q*) aircraft servicing areas and buildings of operational significance;
- (r) VOR checkpoint and radio frequency of the aid concerned;
- (*s*) any part of the depicted movement area permanently unsuitable for aircraft, clearly identified as such; and

(*t*) where established, hotspot locations with additional information properly annotated in tabular form on the face or verso of the chart.

(2) In addition to those items applicable to heliports in sub-clause (1), a chart shall show:

- (a) heliport type;
- (*b*) touchdown and lift-off area including dimensions to the nearest metre, slope, type of surface and bearing strength in tonnes;
- (c) final approach and take-off area including type, true bearing to the nearest degree, designation number where appropriate, length and width to the nearest metre, slope and type of surface;
- (*d*) safety area including length, width and type of surface;
- (e) helicopter clearway including length and ground profile;
- (*f*) obstacles including type and elevation of the top of the obstacles to the next higher foot;
- (g) visual aids for approach procedures, marking and lighting of final approach and take-off area, and of touch-down and lift-off area; and
- *(h)* declared distances to the nearest metre for heliports, where relevant, including—
 - (i) take-off distance available;
 - (ii) rejected take-off distance available; and
 - (iii) landing distance available. PART J

(Regulation 57)

WORLD AERONAUTICAL CHART - ICAO 1: 000 000

The Standards required for Aeronautical Chart – ICAO 1: 000 000 are as follows:

Scale

1.(1) Linear scales for kilometres and nautical miles arranged in the following order:

- (a) kilometres; and
- (b) nautical miles, with their zero points in the same vertical line shall be shown in the margin.

(2) The length of the linear scales shall represent at least 200 km (110 NM).

(3) A conversion scale (metres or feet) shall be shown in the margin.

Format

2. (1) The title and marginal notes shall be in the English Language.

(2) The information regarding the number of the adjoining sheets and the unit of measurement used to express elevation shall be so located as to be clearly visible when the sheet is folded.

(3) The method of folding shall be as follows:

- (*a*) Fold the chart on the long axis near the mid-parallel of latitude, face out, with the bottom part of the chart face upward.
- (*b*) Fold inward near the meridian, and fold both halves backward in accordion folds.

(4) Whenever practicable, the sheet lines shall conform with those shown in the index in Schedule 21.

- Note 1. The area covered by a sheet may vary from the lines shown to satisfy particular requirements.
- Note 2.— The value of adopting identical sheet lines for ICAO 1: 000 000 Charts and the corresponding sheet of the International Map of the World (IMW), provided aeronautical requirements are not compromised, is recognised.

(5) Overlaps shall be provided by extending the chart area on the top and right side beyond the area given on the index. This overlap area shall contain all aeronautical, topographical, hydrographical and cultural information. The overlap shall extend up to 28 km (15 NM), if possible, but in any case from the limiting parallels and meridians of each chart to the neat line.

Projection

3. (1) The projections shall be as follows:

- (a) between the Equator and 80° latitude: the Lambert conformal conic projection, in separate bands for each tier of charts. The standard parallels for each 4° band shall be 40' south of the northern parallel and 40' north of the southern parallel;
- (*b*) between 80° and 90° latitude: the Polar stereographic projection with scale matching that of the Lambert conformal conic projection at latitude 80°, except that in the northern hemisphere the Lambert conformal conic projection may be used between 80° and 84° latitude and the Polar stereographic projection between 84° and 90° with the scales matching at 84° North.

| (2) Graticules and graduations shall be shown as follow |
|---|
|---|

| a) Parallels: | | | |
|---------------|------------|----------------------------|---|
| | Latitude | Distance between parallels | Graduations on parallels |
| | 0° to 72° | 30′ | 1′ |
| | 72° to 84° | 30′ | 5′ |
| | 84° to 89° | 30′ | 1° |
| | 89° to 90° | 30′ | 5° |
| | | | (Only on degree parallels from 72° to 89°) |
| b) Meridians: | | | |
| | Latitude | Interval between meridians | Graduations on meridians |
| | 0° to 52° | 30′ | 1′ |
| | 52° to 72° | 30′ | 1′ |
| | | | (Only on even numbered meridians) |
| | 72° to 84° | 1° | 1′ |
| | 84° to 89° | 5° | 1′ |
| | 89° to 90° | 15° | 1′ |
| | | | (Only on every fourth meridian) |

(3) The graduation marks at 1[®] and 5[®] intervals shall extend away from the Greenwich Meridian and from the Equator. Each 10[®] interval shall be shown by a mark on both sides of the graticule line.

(4) The length of the graduation marks shall be approximately 1.3 mm (0.05 in) for the 1 \odot intervals, and 2 mm (0.08 in) for the 5 \odot intervals and 2 mm (0.08 in) extending on both sides of the graticule line for the 10 \odot intervals.

(5) All meridians and parallels shown shall be numbered in the borders of the chart. In addition, each parallel shall be numbered within the body of the chart in such a manner that the parallel can be readily identified when the chart is folded.

Note. - Meridians may be numbered within the body of the chart.

(6) The name and basic parameters of the projection shall be indicated in the margin.

Identification

4. Sheet numbering shall be in conformity with the index in Schedule 21.

Note. — The corresponding International Map of the World (IMW) sheet number may also be shown.

Culture and Topography

5. (1) In built-up areas, cities, towns and villages shall be selected and shown on the chart according to their relative importance to visual air navigation.

(2) Cities and towns of sufficient size shall be indicated by the outline of their built-up areas and not of their established city limits.

(3) All railroads having landmark value shall be shown on the chart.

Note 1: In congested areas, some railroads may be omitted in the interest of legibility. Note 2: Railroads may be named where space permits. Note 3: Rail stations may be shown.

(4) Important tunnels shall be shown.

Note: A descriptive note may be added.

(5) Road systems shall be shown on the chart in sufficient detail to indicate significant patterns from the air.

(6) Roads shall not be shown in built-up areas unless they can be distinguished from the air as definite landmarks.

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Note. — The numbers or names of important highways may be shown.
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(7) Natural and cultural landmarks, such as bridges, prominent transmission lines, permanent cable car installations, wind turbines, mine structures, forts, ruins, levees, pipelines, rocks, bluffs, cliffs, sand dunes, isolated lighthouses and lightships, when considered to be of importance for visual air navigation, shall be shown on the chart.

Note: Descriptive notes may be added.

(8) International boundaries shall be shown on the chart and undemarcated or undefined boundaries shall be distinguished by descriptive notes.

(9) Hydrograph information such as water features compatible with the scale of the chart comprising shore lines, lakes, rivers and streams including those that are non-perennial in nature, salt lakes, glaciers and ice caps shall be shown on the chart.

(10) The tint covering large open water areas shall be kept very light.

Note. — A narrow band of darker tone may be used along the shore line to emphasise this feature.

(11) Reefs and shoals, including rocky ledges, tidal flats, isolated rocks, sand, gravel, stone and all similar areas, shall be shown by symbols when of significant landmark value.

Note. — Groups of rocks may be shown by a few representative rock symbols within the area.

(12) Contours shall be shown on the chart with the selection of intervals governed by the requirement to depict clearly the relief features required in air navigation.

(13) The values of the contours used shall be shown on the chart.

(14) When hypsometric tints are used, the range of elevations for the tints shall be shown on the chart and the scale used shown in the margin.

(15) Spot elevations shall be shown on the chart at selected critical points.

(16) The elevation selected in sub-clause (15) shall always be the highest in the immediate vicinity and shall generally indicate the top of a peak and ridge.

(17) Elevations in valleys and at lake surface levels which are of navigational value shall be shown on the chart.

(18) The position of each selected elevation shall be indicated by a dot on the chart.

(19) The elevation measured in metres or feet of the highest point on the chart and its geographical position to the nearest five (5) minutes shall be indicated in the margin.

(20) The spot elevation of the highest point in any sheet shall be cleared of hypsometric tinting.

(21) Areas on the chart that have not been surveyed for contour information shall be labelled "Relief data incomplete".

(22) Charts on which spot elevations are generally unreliable shall bear a warning note prominently displayed on the face of the chart in the colour used for aeronautical information, as follows:

"Warning - The reliability of relief information on this chart is doubtful and elevations shall be used with caution".

(23) Escarpments shall be shown when they are prominent landmarks or when cultural detail is very sparse.

(24) Wooded areas shall be shown with the approximate extreme northern or southern limits of tree growth indicated by a dashed black line and appropriately labelled.

(25) The date of latest information shown on the topographic base shall be indicated in the margin.

Magnetic Variation

6. (1) Isogonic lines shall be shown on the chart.

(2) The date of the isogonic information shall be indicated in the margin.

Aeronautical Data

7. (1) Aeronautical data shown shall be kept to a minimum consistent with the use of the chart for visual navigation and the revision cycle.

(2) Land and water aerodromes and heliports shall be shown with their names, to the extent that they do not produce undesirable congestion on the chart, priority being given to those of greatest aeronautical significance.

(3) The aerodrome elevation, the lighting available, the type of runway surface and the length of the longest runway or channel, shown in abbreviated form for each aerodrome in conformity with the example given in Schedule 18, provided they do not cause undesirable clutter on the chart, shall be indicated.

(4) Abandoned aerodromes which are still recognisable as aerodromes from the air shall be shown and identified as abandoned.

(5) Objects of a height of three hundred feet (300 ft) and more above ground shall be shown as obstacles on the chart.

(6) When considered of importance to visual flight, prominent transmission and permanent cable car installations and wind turbines, which are obstacles, shall be shown on the chart.

(7) Prohibited, restricted and danger areas shall be shown on the chart.

(8) Significant elements of the air traffic services system including, where practicable, control zones, aerodrome traffic zones, control areas, flight information regions and other airspaces in which VFR flights operate shall be shown on the chart together with the appropriate class of airspace.

(9) Where appropriate, the air defence identification zone (ADIZ) shall be shown and properly identified on the chart.

(10) Radio navigation aids shall be shown on the chart by the appropriate symbol and named, but excluding their frequencies, coded designators, times of operation and other characteristics unless any or all of this information which is shown is kept up to date by means of new editions of the chart.

(11) Aeronautical ground lights together with their characteristics or identifications or both shall be shown on the chart.

(12) Marine lights on outer prominent coastal or isolated features of not less than twenty-eight kilometres (28 km) or fifteen nautical miles (15 nm) visibility range shall be shown on the chart –

- (a) where they are not less distinguishable than more powerful marine lights in the vicinity;
- (b) where they are readily distinguishable from other marine or other types of lights in the vicinity of built-up coastal areas; or
- (c) where they are the only lights of significance available.

PART K

(Regulation 58)

AERODROME TERRAIN AND OBSTACLE CHARTS – ICAO (ELECTRONIC)

The Standards required for Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) are as follows:

Function

1. The function of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be to portray the terrain and obstacle data in combination with aeronautical data, as appropriate, necessary to –

- (*a*) enable an operator to comply with the aircraft performance limitations by developing contingency procedures for use in the event of an emergency during a missed approach or takeoff, and by performing aircraft operating limitations analysis; and
- (*b*) support the following air navigation applications:
 - (i) instrument procedure design including circling procedure;

- (ii) aerodrome obstacle restriction and removal; and
- (iii) provision of source data for the production of aeronautical charts.

Availability

2. (1) Aerodrome Terrain and Obstacle Charts - ICAO (Electronic) shall -

- (*a*) be made available for all aerodromes regularly used by international civil aviation from 12th November 2015;
- (b) be made available in hard copy format upon request;
- (c) use ISO 19100 series of standards for geographic information as a general data modelling framework.

(2) Aerodrome Terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in Regulation 45 for all aerodromes regularly used by international civil aviation.

Note: The use of ISO 19100 series of standards for geographic information supports the interchange and use of the Aerodrome Terrain and Obstacle Chart – ICAO (Electronic) among different users.

Identification

3. Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be identified by –

- (a) the name of the country in which the aerodrome is located;
- (b) the name of city or town which the aerodrome serves; and
- (c) the name of the aerodrome.

Chart Coverage

4. The extent of each Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be sufficient to cover Area 2 as specified in Clause 2 of Part H of Schedule 16 in the Regulations.

Chart Content

5. (1) Where computer graphic applications are being developed to portray features on the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic), the relationships between features, feature attributes, and the

underlying spatial geometry and associated topological relationships shall be specified by an application schema.

(2) Portrayed information on the Aerodrome Terrain and Obstacle Charts ICAO (Electronic) shall be provided on the basis of portrayal specifications applied according to defined portrayal rules.

(3) Portrayal specifications and portrayal rules shall not be part of the data set of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic).

(4) Portrayal rules of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be stored in a portrayal catalogue which shall make reference to separately-stored portrayal specifications.

Note: ISO Standards 19117 contains a definition of the schema describing the portrayal mechanism of feature-based geographic information, ISO Standards 19109 contains rules for application schema and ISO Standards 19107 defines spatial geometry and associated topographical relationships.

(5) Symbols used to portray features on the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be in accordance with Clause 4 of Part A of Schedule 16 in the regulations and Schedule 18.

(6) Representation of terrain surface shall be provided as a selectable layer of contour lines in addition to the DEM.

(7) An ortho-rectified image which matches the features on the DEM with features on the overlying image shall be used to enhance the DEM. The image shall be provided as a separate selectable layer.

6. (1) The terrain feature, and associated attributes, to be portrayed and database linked to the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be based on the electronic terrain data sets which satisfy the requirements of Part H of Schedule 8 of the Regulations.

(2) The terrain feature on the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be portrayed in a manner that provides an effective general impression of a terrain.

(3) The portrayal of the terrain features on the Aerodrome Terrain and Obstacle Charts – ICAO Electronic) shall be a presentation of terrain surface by continuous elevation values at all intersections of the defined grid, also known as the Digital Elevation Model (DEM).

7. The portrayed terrain feature of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be linked to the following associated attributes in the database:

- (a) horizontal positions of grid points in geographic co-ordinates and elevations of the points;
- (b) surface type;
- (c) contour line values, where provided; and
- (d) names of cities, towns and other prominent topographic features.

8. Other terrain attributes specified in Annex 15, Appendix 8, Table A8-3, and provided in the database(s) shall be linked to the portrayed terrain feature.

9. (1) Obstacle features, and associated attributes, portrayed or data-base linked to the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be based on electronic obstacle data sets which satisfy the requirements of Part H of Schedule 8 of the Regulations.

(2) Each obstacle shall be portrayed by an appropriate symbol and obstacle identifier on the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic).

(3) The portrayed obstacle feature of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be linked to the following associated attributes in the database:

- (a) horizontal position in geographic co-ordinates and associated elevation;
- (b) obstacle type; and
- (c) obstacle extent, where appropriate.

10. Other obstacle attributes specified in Annex 15, Appendix 8, Table A8-4, and provided in the database(s) shall be linked to the portrayed obstacle feature.

11.(1) Aerodrome features, and associated attributes, portrayed and database linked to the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be based on aerodrome data which satisfy the requirements of Annex 14, Volume I, Appendix 5 and Schedule 9 of the Regulations.

(2) The following aerodrome features of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be portrayed by an appropriate symbol:

- (*a*) aerodrome reference point;
- (*b*) runways, with designation numbers, and where available, stopways and clearways; and
- (*c*) taxiways, aprons, large buildings and other prominent aerodrome features.

(3) The portrayed aerodrome feature of the Aerodrome Terrain and Obstacle Charts – ICAO (Electronic) shall be linked to the following associated attributes in the database:

- (a) geographical co-ordinates of the aerodrome reference point;
- (*b*) aerodrome magnetic variation, year of information and annual change;

Note: Magnetic variation may be database linked to the aerodrome reference point.

- (c) length and width of runways, stopways and clearways;
- (*d*) type of surface of runways and stopways;
- (e) magnetic bearings of the runways to the nearest degree;
- (f) elevations at each end of runway(s), stopways and clearways, and at each significant change in slope of runways and stopways; and
- (g) declared distances for each runway direction, or the abbreviation "NU" where a runway direction cannot be used for take-off or landing or both.

12. Each radio navigation aid feature located within the chart coverage shall be portrayed by an appropriate symbol.

Note: Navigation aid feature attributes may be linked to the portrayed navigation aid features in the databases.

Accuracy and Resolution

13. (1) The order of accuracy of aeronautical data shall be as specified in Schedule 6 of the Regulations and Annex 14, Volume I, Appendix 5 and Volume II, Appendix 1.

(2) The order of accuracy of terrain and obstacle data shall be as specified in Part H of Schedule 8 in the Regulations.

(3) The aeronautical data resolution shall be as specified in Schedule 9 in the Regulations while the resolution for terrain and obstacle data shall be as specified in Schedule 15 in the Regulations.

Electronic Functionality

14. (1) It shall be possible to vary the scale at which the chart is viewed so that symbols and text size vary with chart scale to enhance readability.

(2) Information on the chart shall be geo-referenced, and it shall be possible to determine cursor position to at least the nearest second.

(3) The chart shall be compatible with widely available desktop computer hardware, software and media.

(4) The chart shall include its own "reader" software.

(5) It shall not be possible to add or remove information from the chart without an authorised update.

(6) To avoid clutter of information and where the details necessary to support the function of the chart cannot be shown with sufficient clarity on a single comprehensive chart view, selectable information layers shall be provided to allow for the customised combination of information.

Note: An electronic chart format with user-selectable information layers is the preferred method of presentation for most aerodrome features.

(7) It shall be possible to print the chart in hard copy format according to the content specifications and scale determined by the user.

- *Note 1: Printed output may be 'tiled' sheets or specific selected areas according to user requirements.*
- Note 2: Feature attribute information available through database link may be supplied separately on appropriately reference sheets.

Chart Data Product Specifications

15.(1) A comprehensive statement of the data sets comprising the chart shall be provided in the form of data product specifications on which basis air navigation users will be able to evaluate the chart data product and whether it fulfills the requirements for its intended use or application.

(2) The chart data product specifications shall include an overview, a specification scope, a data product identification, data content information, the reference systems used, the data quality requirements and information data capture, data maintenance, data portrayal, data product delivery, as well as any additional information available and metadata.

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

(3) The overview of the chart data product specifications shall pro-vide an informal description of the product and shall contain general information about the data product.

(4) The specification scope of the chart data product specifications shall contain the spatial (horizontal) extent of the chart coverage.

(5) The chart data product identification shall include the title of the product, a brief narrative summary of the content and purpose, and a description of the geographic area covered by the chart.

(6) The data content of the chart data product specifications shall clearly identify the type of coverage or imagery and shall provide a narrative description of each.

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

(7) The chart data product specifications shall include information that defines the reference systems used.

(8) The reference system referred to in sub-clause (7) shall include the spatial reference system (horizontal and vertical) and, where appropriate, temporal reference system.

(9) The chart data product specifications shall identify the data quality requirement and include a statement on acceptable conformance quality levels and corresponding data quality measures covering all the data quality elements and data quality sub-elements, even if only to state that a specific data quality element or sub-element is not applicable.

Note: ISO Standard 19113 contains quality principles for geographic information and ISO Standard 19114 covers quality evaluation procedures.

(10) The chart data product specifications shall include a data statement which shall be a general description of the sources and of processes applied for the capture of chart data.

(11) The principles and criteria applied in the maintenance of the chart shall also be provided in the chart data product specifications, including the frequency with which the chart product is updated particularly the maintenance information of obstacle datasets included on the chart and an indication of the principles, methods and criteria applied for obstacle data maintenance.

- (12) The chart data product specifications shall contain -
 - (*a*) information on how data are portrayed on the chart, as detailed in clause 5; and
 - (*b*) data product delivery information including delivery formats and delivery medium information.

(13) The core chart metadata elements shall be included in the chart data product specifications and additional metadata items required to be supplied shall be stated in the product specifications together with the format and encoding of the metadata.

- Note 1: ISO Standard 19115 specifies requirements for geographic information metadata.
- Note 2: The chart data product specifications document in the chart data product which is implemented as a data set which is described by metadata.

SCHEDULE 17

[Schedule 16, Part A 3(1)]

MARGINAL NOTE LAYOUT



SCHEDULE 18

AERONAUTICAL CHART SYMBOLS

[Schedule 16, Part A, Clause 4]

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| Index ATS/MET reporting point — MRP Change-over point — COP Control area, Airway, Controlled route Control zone — CTR Final approach fix — FAF Flight information region — FIR Reporting and Fly-by/Flyover functionality | Symbol No. 123 122 113 116 124 111 121 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles | Symbol No. 128 136 135 134 132 133 |
| Index ATS/MET reporting point — MRP Change-over point — COP Control area, Airway, Controlled route Control zone — CTR Final approach fix — FAF Flight information region — FIR Reporting and Fly-by/Flyover functionality Scale-break (on ATS route) | Symbol No. 123 122 113 116 124 111 121 120 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles Lighted obstacle | Symbol No. 128 136 135 134 132 133 131 |
| Index ATS/MET reporting point — MRP Change-over point — COP Control area, Airway, Controlled route Control zone — CTR Final approach fix — FAF Flight information region — FIR Reporting and Fly-by/Flyover functionality Scale-break (on ATS route) Uncontrolled route | Symbol No. 123 122 113 116 124 111 121 120 114 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles Lighted obstacle Obstacle Obstacle | Symbol No. 128 136 135 134 132 133 131 130 |
| Index ATS/MET reporting point — MRP Change-over point — COP Control area, Airway, Controlled route Control zone — CTR Final approach fix — FAF Final approach fix — FAF Filight information region — FIR Reporting and Fly-by/Flyover functionality Scale-break (on ATS route) Uncontrolled route | Symbol No. 123 122 113 116 124 111 121 120 114 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles Lighted obstacle Obstacle Itighted obstacle | Symbol No. 128 136 135 134 132 133 131 130 |
| Index ATS/MET reporting point — MRP Change-over point — COP Control area, Airway, Controlled route Control zone — CTR Final approach fix — FAF Filght information region — FIR Reporting and Fly-by/Flyover functionality Scale-break (on ATS route) Uncontrolled route Miscellaneous ((137–141) | Symbol No. 123 122 113 116 124 111 121 120 114 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles Lighted obstacle Obstacle Intermediate holding position | Symbol No. 128 136 135 134 132 133 131 130 160 |
| Index | Symbol No. 123 122 113 116 124 111 121 120 114 138 | air corridor Index Restricted airspace (prohibited, restricted or danger area) Obstacles (130–136) Elevation of top/Height above specified datum Exceptionally high obstacle — lighted (optional symbol) Exceptionally high obstacle (optional symbol) Group obstacles Lighted group obstacles Lighted obstacle Obstacle Intermediate holding position Landing direction indicator (i-abstacle) | Symbol No. 128 136 135 134 132 133 131 130 160 156 |

| Ocean station vessel (normal | 139 | Landing direction indicator | 157 |
|-----------------------------------|--------|-----------------------------------|--------|
| position) | | (unlighted) | |
| Prominent transmission line | 137 | Obstacle light | 155 |
| Wind turbine – unlighted and | 140 | Pierced steel plank or steel mesh | 146 |
| lighted | | runway | 454 |
| Wind turbines — minor group | 141 | Point light | 154 |
| and group in major area, | | | |
| | | Democratic halding and sitism | 150 |
| Visual Atas (142–144) | 140 | Runway-noiding position | 159 |
| Aeronautical ground light | 143 | observation site | 155 |
| Lightship | 144 | Stop bar | 158 |
| Marine light | 142 | Stopway | 148 |
| SYMBOLS FOR | | Taxiways and parking areas | 149 |
| AERODROME/HELIPORT | | | |
| CHARTS (145–161) | | | |
| Aerodrome reference point | 151 | Unpaved runway | 147 |
| Hard surface runway | 145 | VOR check-point | 152 |
| Helicopter alighting area on an | 150 | SYMBOLS FOR AERODROME | |
| aerodrome | | OBSTACLE CHARTS – TYPE A, | |
| | | B AND C (162–170) | |
| Hot spot | 161 | Building or large structure | 164 |
| Clearway | 170 | Collocated DME fix and marker | 180 |
| | | beacon | |
| Escarpment | 168 | Collocated radio navigation aid | 178 |
| - | | and marker beacon | |
| Pole, tower, spire, antenna, etc. | 163 | DME fix | 179 |
| Railroad | 165 | Holding pattern | 173 |
| | | 01 | |
| Index | Symbol | Index | Symbol |
| | No. | | No. |
| Stopway | 169 | Minimum sector altitude | 171 |
| Terrain penetrating obstacle | 167 | Missed approach track | 174 |
| plane | | | |
| Transmission line or overhead | 166 | Radio marker beacon | 177 |
| cable | | | |
| Tree or shrub | 162 | Radio navigation aid | 176 |
| ADDITIONAL SYMBOLS | | Runway | 175 |
| FOR USE ON PAPER AND | | | |
| ELECTRONIC CHARTS | | | |
| (171–180) | | | |
| | | Terminal arrival altitude | 172 |



HYDROGRAPHY





Reservoir

Alternative



| | | ve. | | : | 34 | Salt pans (evaporato | xr) | | | 42 | Glaciers and ice caps | PETTO |
|----|---------------------------------------|------------|-------------|---|----|----------------------|---------|---------|----------|----|--|---------------|
| 25 | Rivers and streams (non-perennial) | Alternativ | 5225252 | 3 | 35 | Swamp | | | <u> </u> | 43 | Danger line (2 m or one fathom line) | ÷ |
| 26 | Rivers and streams (unsurveyed) | | L' | 3 | 36 | Rice field | | emative | | 44 | Charted isolated rock | + |
| 27 | Rapids | | | | | | | A5 | | 45 | Rock awash | æ |
| 28 | Falls | | | | 27 | Spring, well or | perenr | ial | • | | | 6 |
| 29 | Canal | | | | 31 | water hole | intermi | ttent | o | 46 | Unusual water features appropriately labelled | (Covered Reef |

BUILT-UP AREAS

HIGHWAYS AND ROADS

MISCELLANEOUS (Cont.)

| 47 | City or large town | |
|----|--------------------|----|
| 48 | Town | 0 |
| 49 | Village | 0 |
| 50 | Buildings | 81 |

59 Secondary road 60 Trail 61 Road bridge 62 Road tunnel

57 Dual highway

58 Primary road

| | RAILROADS | |
|----|-------------------------------|------------------|
| 51 | Railroad (single track) | |
| 52 | Railroad (two or more tracks) | ∔ • * |
| 53 | Railroad (under construction) | |
| 54 | Railroad bridge | →≒ |
| 55 | Railroad tunnel | 0 |
| 56 | Railroad station | ↓■↓ ↓ |

| | MISCELLANEO | JS |
|----|--|--------|
| 63 | Boundaries (international) | |
| 64 | Outer boundaries | |
| 65 | Fence | x—x—x |
| 66 | Telegraph or telephone line (when a landmark) | —т—т— |
| 67 | Dam | \sim |
| 68 | Ferry | // |

| ripenne Pipenne | ~ |
|--------------------------|-----|
| 70 Oil or gas field | < |
| 71 Tank farms | ••• |
| 72 Nuclear power station | |
| 73 Coast guard station | - |
| 74 Lookout tower |) |
| 75 Mine | |
| 76 Forest ranger station | Ŀ |
| 77 Race track or stadium | ٢ |
| 78 Ruins | • |
| 79 Fort | (|
| 80 Church 3 | - |
| 81 Mosque | |
| 82 Pagoda | |
| 83 Temple | t |

AERODROMES



95

| Land | ¢ | | 92 | Sheltered anchorage | Ĵ |
|-------|-----------|--|----|--|---|
| Water | -@- | | 93 | Aerodrome for use on charts on which aerodrome classification is not required e.g. Enroute Charts | ¢ |
| es | 0 | | | | |
| drome | \otimes | | 94 | Heliport Note.— Aerodrome for the exclusive use of helicopters | H |

Note.— Where required by the function of the chart, the runway pattern of the aerodrome may be shown in lieu of the aerodrome symbol, for example:

| 4 | � ♥ | |
|---|--------|--|

AERODROMES (Cont.) AERODROME DATA IN ABBREVIATED FORM WHICH MAY BE IN ASSOCIATION WITH AERODROME SYMBOLS (Reference: 16.9.2.2 and 17.9.2.2)


AERODROME SYMBOLS FOR APPROACH CHARTS





AIR TRAFFIC SERVICES

| | 111 | Right information region | FIR | | <u> </u> | | 117 | Air defence ider | tification zone | ADIZ | | ADIZ | | |
|---|-----|----------------------------|-----|--------|----------|---|----------|-----------------------|---|--------------------|--|---------------|--|-----------|
| | 112 | Aerodrome traffic zone | ATZ | | | | | | | | 1 | | | |
| | | | | | | | | | | | | ===== | | |
| | | Control area | CTA | native | | | 118 Advi | Advisory route | | ADR | Viernativ | | | |
| | 113 | Airway Controlled route | AWY | Alter | | | | | | | | | | |
| | | | | | | | | | | | compulsory with radio communication | n requirement | | ••••®•••• |
| | 114 | Uncontrolled route | | | | | 119 | Visual flight path | compulsory, without radio communication | t m requirement | | ••••®•••• | | |
| | - | | | | | | | | recommended | | | ••••• | | |
| | 115 | Advisory airspace | ADA | | | | | Scale-break | | | ative | | | |
| | 116 | Control zone | CTR | | | | 120 | (on ATS route) | (on ATS route) | | Alterné | | | |
| l | | | | | 1 | 1 | | | | | | | | |

| | | | On request fly-by | Compulsory fly-by | On request flyover | Compulsory flyover |
|-----|---|---------------------|----------------------|----------------------|--------------------|-----------------------|
| | | VFR reporting point | | | | |
| | | Intersection INT | | | | |
| | | VORTAC | \$ | * | ? | |
| 121 | Reporting and fly-by/flyover functionality | TACAN | \bigtriangledown | * | \bigtriangledown | ۲ |
| | | VOR | \odot | • | \odot | |
| | | VOR/DME | K۰X | | | |
| | | NDB | ٢ | ۲ | | ۲ |
| | | Waypoint WPT | \diamond | + | \diamond | \bigcirc |
| | NoteSee 2.4.4 and 2.4.5 | | | I | | |

505

| 400 | Change-over point | COP | 26 | | ATSMET | MDD | Compulsory | 104 | Final anatomic for | FAF. | 4. |
|-----|--|-----|----|-----|-----------------|------|------------|-----|--------------------|------|----|
| 122 | appropriate route symbol at right angles to the route | | 36 | 123 | reporting point | MICI | On request | 124 | Pinai approach fix | FAF | • |

AIRSPACE CLASSIFICATIONS



VISUAL AIDS

| | | | ₽. | | Note 1.— Marine alternation indicated. Marine | ng lights are e lights are v | red and white unless ot white unless colours are | herwise stated. | |
|-----|--|---------------|------------------------------|-------------|--|---------------------------------|---|--------------------|------------------------------|
| 142 | Marine light Note 2.—Characteristics are to be indicated as follows: | Alt B F | Alternating Blue Fixed | F G G | I Flashing Green p Group | Occ R SEC | Occulting Red Sector | (U) W | Second Unwatched White |
| 143 | Aeronautical ground light | * | Electronic | 144 | Lightship | | | | * |

SYMBOLS FOR AERODROME/HELIPORT CHARTS

| 145 | Hard surface runway | | | Delated | • |
|-----|--|------------------|-----|---|------------|
| 146 | Pierced steel plank or steel mesh runway | | 154 | Point light | 0 |
| 147 | Unpaved runway | | 155 | Obstacle light | şiç |
| 148 | Stopway SWY | | 156 | Landing direction indicator (lighted) | Ť |
| 149 | Taxiways and narking areas | | 157 | Landing direction indicator (unlighted) | т |
| | | | 158 | Stop bar | ••• |
| 150 | Helicopter alighting area on an aerodrome | Э | 159 | Runway-holding Pattern A | |
| 151 | Aerodrome reference point ARP | + | | Note. — For application, see Annex 14, Volume I, 5.2.10. | |
| 152 | VOR check-point | +⊖ | 160 | Intermediate holding position Note.—For application, see Annex 14, Volume I, 5.2.11. | |
| 153 | Runway visual range (RVR) observation site | \triangleright | 161 | Hot spot NoteHot spot location to be circled. | \bigcirc |

| | | Plan | Profile | | | Plan | Profile |
|-----|-------------------------------------|---------|--------------------------|-----|------------------------------------|------------|---------|
| 162 | Tree or shrub | × | Identification number | 167 | Terrain penetrating obstacle plane | \bigcirc | |
| 163 | Pole tower spire antenna etc. | | number | | | \sim | |
| | | Ŭ | | 168 | Escarpment | | ****** |
| 164 | Building or large structure | | <u>``</u> | | | | |
| | | | | 169 | Stopway SWY | | -1 |
| 165 | Railroad | | | | | <u> </u> | - 4 |
| 105 | Railloau | + + + + | | | | | 1 |
| 166 | Transmission line or overhead cable | —т—т— | | 170 | Clearway CWY |]] | |

SYMBOLS FOR AERODROME OBSTACLE CHARTS - TYPE A, B AND C

ADDITIONAL SYMBOLS FOR USE ON PAPER AND ELECTRONIC CHARTS

| | PLAN VIEW | | Electronic |
|-----|--|-----|-------------------------------------|
| 171 | Minimum sector altitude Note.—This synto-Imay be modified to reflect particular sector shapes. | MSA | |
| 172 | Terminal arrival altitude Note.—This symbol may be modified to reflect particular TAA shapes. | TAA | S 7000 25NM to COM ^{NG} |
| 173 | Holding pattern | | |
| 174 | Missed approach track | | $ \rightarrow$ |

| | PROFILE | |
|-----|--|--------------------|
| 175 | Runway | |
| 176 | Radio navigation aid (type of aid and its use in the procedure to be annotated on top of the symbol) | |
| 177 | Radio marker beacon (type of beacon to be annotated on top of the symbol) | \bigtriangledown |
| 178 | Collocated radio navigation aid and marker beacon (type of aid to be annotated on top of the symbol) | \square |
| 179 | DME fx (distance from DME and the fix use in the procedure to be annotated on top of the symbol) | |
| 180 | Collocated DME fix and marker beacon (distance from DME and the type of beacon to be annotated on top of the symbol) | |

COLOUR GUIDE FOR AERONAUTICAL CHARTS

| CHART SY | MBOLS | | |
|---|----------|--------------------|--|
| Culture, except highways and roads; outlines of large cities, grids and graticules; spot elevations, danger lines and diff-shore rocks; names and lettering except for aeronautical and hydrographic features | | BLACK | |
| Buit-up areas of cities | | BLACK Stipple | |
| | Optional | BLACK Haif-tone | |
| Highways and roads | colours | RED | |
| Built-up areas for cities (alternative to black stipple) | | YELLOW | |
| Contours and topographic features: Items 1 through 10 of Appendix 2 Hydrographic features: Items 39 through 41 of Appendix 2 | | BROWN | |
| Shore lines, drainage, rivers, lakes, battymetric contours and other hydrographic features including their names or description | | BLUE | |
| Open water areas | | BLUE Haif-tone | |
| Salt lakes and salt pans | | BLUE Stipple | |
| Large non-perennial rivers and non-perennial lakes | | BLUE Stipple | |
| Aeronautical data, except for Enroute and Area Charts — ICAO, where different colours may be required. Both contours may be used on the same sheet | Optional | MAGENTA | |
| but, where only one colour is used, dark blue is preferred | colours | DARK BLUE | |





HYPSOMETRIC TINT GUIDE FOR AERONAUTICAL CHARTS



Note 2.— Elevations have not been associated with tints of either system in order to allow for flexibility in their selection.

SCHEDULE 21

WORLD AERONAUTICAL CHART ICAO 1:000 000



[Schedule 8, Part A, Clause 16]

DATA QUALITY REQUIREMENTS FOR AERONAUTICAL CHARTS

| Table 1 - Latitude and Longitude | | | | |
|---|------------------|-------------------------------|--|--|
| Latitude and Longitude | Chart Resolution | Integrity / classification | | |
| Flight information region boundary points | As plotted | routine | | |

| P, R, D area boundary points (outside CTA/CTZ | As plotted | routine |
|---|-----------------------------|---------------------|
| boundaries) | | |
| P, R, D area boundary points (inside CTA/CTZ | As plotted | essential |
| boundaries) | | |
| CTA/CTZ boundary points | As plotted | essential |
| En route navaids, intersections and waypoints, and | 1 sec | essential |
| holding STAR/SID points | | |
| Obstacles in Area 1 (the entire State territory) | As plotted | routine |
| Aerodrome/heliport reference point | 1 sec | routine |
| NAVAIDS located at aerodrome/heliport | As plotted | essential |
| Obstacles in Area 3 | 1/10 sec | essential |
| Obstacle in Area 2 | 1/10 sec | essential |
| Final approach fixes/points and other essential | 1 sec | essential |
| fixes/points comprising the instrument approach | | |
| procedure | | |
| Runway threshold | 1 sec | critical |
| Runway end (flight path alignment point) | 1 sec | Critical |
| Runway holding point | 1 sec | Critical |
| Taxiway centre line/parking guidance line points | 1/100 sec | Essential |
| Taxiway intersection marking line | 1 sec | Essential |
| Exit guidance line | 1 sec | Essential |
| Aircraft stand points/INS checkpoints | 1/100 sec | Routine |
| Geometric centre of TLOF or FATO threshold, | 1 sec | critical |
| heliport | | |
| Apron boundaries (polygon) | 1 sec | Routine |
| De-icing/anti-icing facility (polygon) | 1 sec | routine |
| Note: See Schedule 15 for graphical illustrations of obstacle identify obstacles in the defined areas. | data collection surfaces an | nd criteria used to |

| Table 2 - Elevation/Altitude/Height | | | | | |
|--|------------------|-------------------------------|--|--|--|
| Elevation/Altitude/Height | Chart Resolution | Integrity / classification | | | |
| Aerodrome/heliport elevation | 1 m or 1 ft | essential | | | |
| WGS-84 geoid undulation at aerodrome/heliport elevation position | 1 m or 1 ft | essential | | | |
| Runway or FATO threshold, non-precision approaches | 1 m or 1 ft | essential | | | |
| WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, non-precision approaches | 1 m or 1 ft | essential | | | |

| Runway or FATO threshold, precision approaches | 0.5 m or 1 ft | critical |
|--|---|------------------------|
| WGS-84 geoid undulation at runway or FATO threshold, TLOF geometric centre, precision approaches | 0.5 m or 1 ft | critical |
| Threshold crossing height, precision approaches | 0.5 m or 1 ft | critical |
| Obstacle clearance altitude and height (OCA/H) | As specified in PANS-OPS (Doc 8168) | essential |
| Obstacles in Area 2 | 1 m or 1 ft | essential |
| Obstacles in Area 3 | 1 m or 1 ft | essential |
| Obstacles in Area 1 (the entire State territory) | 3 m or 10 ft | routine |
| Distance measuring equipment (DME) | 30 m (100 ft) | essential |
| Instrument approach procedures altitude | as specified in PANS-OPS (Doc 8168 | essential |
| Minimum altitudes | 50 m or 100 ft | routine |
| Heliport crossing height, PinS approaches | 1 m or 1 ft | essential |
| Note: See Schedule 15 for graphical illustration of identify obstacles in defined areas. | obstacle data collection surface | s and criteria used to |

| Table 3. Gradient and Angles | | | |
|---|------------------|----------------------------|--|
| Type of gradient/angle | Chart resolution | Integrity / Classification | |
| Non-precision final approach and descent gradient | 0.1 percent | Critical | |
| Final approach descent angle (Non-precision approach or approach with vertical guidance) | 0.1 degree | Critical | |
| Precision approach glide path/elevation angle | 0.1 degree | Critical | |

| Table 4 - Magnetic Variation | | |
|--|------------------|----------------------------|
| Declination/Variation | Chart Resolution | Integrity / classification |
| Aerodrome/heliport magnetic variation | 1 degree | essential |

| Table 5 - Bearing | | |
|---|------------------|----------------------------|
| Bearing | Chart Resolution | Integrity / classification |
| Airways segments | 1 degree | routine |
| Bearing used for the formation of an en-route and of a terminal fix | 1/10 degree | routine |
| Terminal arrival/departure route segment | 1 degree | routine |
| Bearing used for the formation of an instrument approach procedure fix | 1/10 degree | essential |
| ILS localiser alignment | 1 degree | essential |
| MLS zero azimuth alignment | 1 degree | essential |
| Runway and FATO bearing | 1 degree | routine |

| Table 6 Length Distance and Dimension | | | |
|---|--|----------------------------|--|
| Table 0 - Lei | Table 6 - Length, Distance and Dimension | | |
| Length/Distance/Dimension | Chart Resolution | Integrity / classification | |
| Airways segment length | 1 km or 1 NM | routine | |
| Distance used for the formation of an en-route fix | 2/10 km (1/10 NM) | routine | |
| Terminal arrival/departure route segment length | 1 km or 1 NM | essential | |
| Distance used for the formation of a terminal and instrument approach procedure fix | 2/10 km (1/10 NM) | essential | |
| Runway and FATO length, TLOF dimensions | 1 m | critical | |
| Runway width | 1 m | essential | |
| Stopway length and width | 1 m | critical | |
| Landing distance available | 1 m | critical | |

| Take-off run available | 1 m | critical |
|---|--------------------|-----------|
| Take-off distance available | 1 m | critical |
| Accelerate-stop distance available | 1 m | critical |
| ILS localiser antenna-runway end, distance | As plotted | routine |
| ILS glide slope antenna-threshold, distance along centre line | As plotted | routine |
| ILS marker-threshold distance | 2/10 km or 1/10 NM | essential |
| ILS DME antenna-threshold, distance along centre line | As plotted | essential |
| MLS azimuth antenna-runway end, distance | as plotted | routine |
| MLS elevation antenna-threshold, distance along centre line | As plotted | routine |
| MLS DME/P antenna-threshold, distance along centre line | As plotted | essential |

SEARCH AND RESCUE SIGNALS

1. Signals with Surface Craft

1.1 The following manoeuvres performed in sequence by an aircraft mean that the aircraft wishes to direct a surface craft towards an aircraft or a surface craft in distress:

- (*a*) circling the surface craft at least once;
- (*b*) crossing the projected course of the surface craft close ahead at low altitude and:
 - i. rocking the wings; or
 - ii. opening and closing the throttle; or
 - iii. changing the propeller pitch.

Note. — Due to high noise level on board surface craft, the sound signals in ii. and iii. may be less effective than the visual signal in 1) and are regarded as alternative means of attracting attention.

(*c*) heading in the direction in which the surface craft is to be directed.

Repetition of such manoeuvres has the same meaning.

- **1.2** The following manoeuvres by an aircraft means that the assistance of the surface craft to which the signal is directed is no longer required:
 - (*a*) crossing the wake of the surface craft close astern at a low altitude and:
 - i. rocking the wings; or
 - ii. opening and closing the throttle; or
 - iii. changing the propeller pitch.

Note. — The following replies may be made by surface craft to the signal in 1.1

- (b) for acknowledging receipt of signals:
 - i. the hoisting of the "code pennant" (vertical red and white stripes) close up (meaning understood);
 - ii. the flashing of a succession of "T's" by signal lamp in the Morse code;
 - iii. the changing of heading to follow the aircraft.
- (c) for indicating inability to comply:
 - i. the hoisting of the international flag "N" (a blue and white checkered square);

ii. the flashing of a succession of "N's" in the Morse code.

Note. — See Note following 1.1 (b), iii.

2. Ground-Air Visual Signal Code

2.1 Ground-Air visual signal code for use by survivors

| No. | Message | Code symbol |
|-----|------------------------------|----------------|
| 1 | Require assistance | \vee |
| 2 | Require medical assistance | × |
| 3 | No or Negative | N |
| 4 | Yes or Affirmative | Y |
| 5 | Proceeding in this direction | 1 |

2.2 Ground-air visual signal code for use by rescue units

| NO. | MESSAGE | CODE SYMBOL |
|-----|--|-------------|
| 1 | Operation completed. | LLL |
| 2 | We have found all personnel. | 노노 |
| 3 | We have found only some personnel. | -++- |
| 4 | We are not able to continue. Returning to base. | XX |
| 5 | Have divided into two groups. Each proceeding in direction indicated. | 4 |
| 6 | Information received that aircraft is in this direction. | |
| 7 | Nothing found. Will continue search. | NN |

2.3 Symbols shall be at least 2.5 metres (8 feet) long and shall be made as conspicuous as possible.

- Note 1. Symbols may be formed by any means such as: strips of fabric, parachute material, pieces of wood, stones or such like material; marking the surface by tramping, or staining with oil.
- Note 2. Attention to the above signals may be attracted by other means such as radio, flares, smoke and reflected light.

3. Air-to-Ground Signals

- **3.1** The following signals by aircraft mean that the ground signals have been understood:
 - (*a*) during the hours of daylight:
 - i. by rocking the aircraft's wings;
 - (*b*) during the hours of darkness:
 - i. flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.
- **3.2** Lack of the above signal indicates that the ground signal is not understood.

SCHEDULE 24

TECHNICAL DOCUMENTS

1. Documents

An aeronautical telecommunication services provider shall ensure that its personnel have easy access to those documents needed for technical applications and references.

2. Document Control

An aeronautical telecommunication services provider shall have in place a documentation control system that will ensure the documents as listed in

below are timely amended and that there are procedures to ensure that technical personnel will be notified and that they have read/understood the amendments.

3. List of Publications and Documents

The minimum scale of fully amended publications and documents to be held at each aeronautical telecommunications unit and available for personnel to consult is as follows:

| Minimum Scale of Publications & Documents | |
|---|--------------|
| All Current Guyana Civil Aviation Legislation | \checkmark |
| Local Unit Instructions (for respective unit as applicable) | \checkmark |
| Temporary Aeronautical Telecommunication Service Instructions | \checkmark |
| NOTAMS (as relevant to its area of responsibility) | \checkmark |
| Aeronautical Information Circulars (AIC) | \checkmark |
| Aeronautical Information Publication & AIP Supplement | \checkmark |
| Aerodrome Manual (for respective airport as applicable) | \checkmark |
| Airport Emergency Plan (for respective aerodrome as applicable) | \checkmark |
| Doc 8071 – Manual on Testing Radio Navigational Aids (VOL I & II) | \checkmark |
| Doc 8259 - Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunication Network | \checkmark |
| Doc 9432 – Manual of Radiotelephony | \checkmark |
| Doc 9613 – Manual of Required Navigation Performance (RNP) | \checkmark |
| Doc 9688 – Manual on Mode S Specific Services | \checkmark |
| Doc 9705 - Manual of Technical Provisions for the Aeronautical Telecommunication Network | \checkmark |
| Doc 9718 - Handbook on Radio Frequency Spectrum Requirements for Civil Aviation | \checkmark |
| Doc 9739 - Comprehensive Aeronautical Telecommunications Network (ATN) Manual | \checkmark |
| Doc 9776 – Manual on VHF Digital Link (VDL) Mode 2 | \checkmark |
| Doc 9805 – Manual on VHF Digital Link (VDL) Mode 3 | \checkmark |
| Doc 9816 – Manual on VHF Digital Link (VDL) Mode 4 | |
| Annex 10 – Aeronautical Telecommunications | \checkmark |

Made this.....day of November, 2016

.....

Hon. David Patterson, MP Minister of Public Infrastructure