Bhutan Civil Aviation Requirement

BCAR-11

Air Traffic Services

Fourth Edition

April 2026

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(i) RECORD OF AMENDMENTS

AMENDMENTS				
No.	Date Applicable	Date Entered	Entered By	Subject(s)
1.	31 Dec 2017	30 Nov 2017	ANS Section	
2.	01 Jan 2020	11 Dec 2019	ANS Section	
3.	28 May 2021	27 Apr 2021	ANS Section	
4.	05 Jan 023	04 Dec 2022	ANS Section	
5.	31 Oct 2024	5 Sept 2024	ANS Section	ICAO amendment no. 53, Included prescriptive regulation for Fatigue management
6.	30 Apr 2026	16 Apr 2026	ANS Section	ICAO amendment no.54, Incorporated relevant provisions from ICAO PANS-ATM and cross-references.
1-6	*Incorporated in this edition*			

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(ii) TABLE OF CONTENTS

(iii) FOREWORD

Section 59 of the Civil Aviation Act of Bhutan 2016 empowers the Head of Authority of Bhutan Civil Aviation Authority (BCAA) to make Rules and Regulations concerning the use of the airspace, air navigation facilities and services. Accordingly, the fourth edition of BCAR–11 (Air Traffic Services) incorporating all the amendments issued till amendment number 6 has been developed.

The fourth edition of BCAR–11 or BCAR–Air Traffic Services, which are to be used interchangeably and construed to refer to this document, is hereby published in accordance with Section 56 of the Act.

During the transposing of the amended standard and recommended practices of Annex 11 the Convention on International Civil Aviation and relevant provisions from PANS-ATM (ICAO Doc 4444) to this BCAR, some provisions that are not applicable or currently irrelevant have been left out and marked "Reserved". These provisions will be incorporated as and when required.

Any difference existing in this BCAR and the related ICAO Standards and Recommended Practices and any amendments thereto will be notified to the ICAO and the same shall be published in the Aeronautical Information Publication (AIP).

This edition hereby supersedes the third edition of BCAR–11 that was published on October 31, 2024.

This is a controlled document and the provisions contained herein are subject to change through amendments.

Director General
Bhutan Civil Aviation Authority

Date: 30/04/2026

CHAPTER 1. DEFINITIONS

Note 1.— Throughout the text of this BCAR the term "service" is used as an abstract noun to designate functions, or service rendered; the term "unit" is used to designate a collective body performing a service.

Note 2.— The designation (RR) in these definitions indicates a definition which has been extracted from the Radio Regulations of the International Telecommunication Union (ITU) (see Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies (*ICAO Doc 9718).*

When the following terms are used in this BCAR for Air Traffic Services, they have the following meanings:

Accepting unit. Air traffic control unit next to take control of an aircraft.

Accident. An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

— being in the aircraft, or

— direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or

— direct exposure to jet blast, *except* when the injuries are from natural causes, self-inflicted or inflicted by other 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:

— adversely affects the structural strength, performance or flight characteristics of the aircraft, and

— would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

c) the aircraft is missing or is completely inaccessible.

Note 1.— For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

Note 2.— An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Note 3.— The type of unmanned aircraft system to be investigated is addressed in Annex - 13, 5.1.

Note 4.— Guidance for the determination of aircraft damage can be found in ICAO Annex - 13, Attachment E.

ADS-C agreement. A reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to priorto 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.

Advisory airspace. An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

Advisory route. A designated route along which air traffic advisory service is available.

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

Aerodrome control service. Air traffic control service for aerodrome traffic.

Aerodrome control tower. A unit established to provide air traffic control service to aerodrome traffic.

Aerodrome traffic. All traffic on the maneuvering area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

Note.— An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

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

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

Aeronautical mobile service (RR S1.32). A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.

Aeronautical telecommunication station. A station in the aeronautical telecommunication service.

Airborne collision avoidance system (ACAS). An aircraft system based on secondary surveillance radar (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. 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. Two-way communication between aircraft and stations or locations on the surface of the earth.

AIRMET information. 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 flightsin the flight information region concerned or sub-area thereof.

Air-taxiing. Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kt).

Note.— The actual height may vary, and some helicopters may require air-taxiing above 8 m (25 ft) AGL to reduce ground effect turbulence or provide clearance for cargo slingloads.

Air traffic. All aircraft in flight or operating on the manoeuvring area of an aerodrome.

Air traffic advisory service. A service provided within advisory airspace to ensure separation, in so faras practical, between aircraft which are operating on IFR flight plans.

Air traffic control clearance. Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note 1.— For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

Note 2.— The abbreviated term "clearance" may be prefixed by the words "taxi," "take-off," "departure," "en route," "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.

Air traffic control service. A service provided for the purpose of:

a) preventing collisions:

   1) between aircraft, and

   2) on the manoeuvring area between aircraft and obstructions; and

b) expediting and maintaining an orderly flow of air traffic.

Air traffic control unit. A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.

Air traffic controller schedule. A plan for allocating air traffic controller duty periods and non-duty periods over a period of time, otherwise referred to as a roster.

Air traffic flow management (ATFM). A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the ATS provider.

Air traffic service. A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Air traffic services airspaces. Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

Note.— ATS airspaces are classified as Class A to G as described in 2.6.

Air traffic services reporting office. A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

Note.— An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.

Air traffic services unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Airway. A control area or portion thereof established in the form of a corridor.

ALERFA. The code word used to designate an alert phase.

Alerting service. A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

Alert phase. A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

Alternate aerodrome. 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 where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

Take-off alternate. An alternate aerodrome at which an aircraft would be able to land should thisbecome necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate. An alternate aerodrome at which an aircraft would be able to land in the eventthat a diversion becomes necessary while en route.

Destination alternate. An alternate aerodrome at which an aircraft would be able to land should itbecome either impossible or inadvisable to land at the aerodrome of intended landing.

Note.— The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.

Altitude. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.

Approach control service. Air traffic control service for arriving or departing controlled flights.

Approach control unit. A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

ATS provider. The relevant air navigation service provider designated by the State responsible for providing air traffic services in the airspace concerned.

Apron. A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Apron management service. A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

Area control centre. A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Area control service. Air traffic control service for controlled flights in control areas.

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

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

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

ATS route. A specified route designed for channeling the flow of traffic as necessary for the provisionof air traffic services.

Note 1.— The term "ATS route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

Note 2.— An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the ATS provider, the lowest safe altitude.

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

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

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

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

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

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

Base turn. 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. The tracks are not reciprocal.

Note.— Base turns may be designated as being made either in level flight or while descending,according to the circumstances of each individual procedure.

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

Change-over point. The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

Note.— Change-over points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuthguidance for all aircraft operating along the same portion of a route segment.

Clearance limit. The point to which an aircraft is granted an air traffic control clearance.

Conference communications. Communication facilities whereby direct speech conversation may be conducted between three or more locations simultaneously.

Control area. A controlled airspace extending upwards from a specified limit above the earth.

Controlled aerodrome. An aerodrome at which air traffic control service is provided to aerodrome traffic.

Note.— The term "controlled aerodrome" indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.

Controlled airspace. An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.

Note.— Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E as described in 2.6.

Controlled flight. Any flight which is subject to an air traffic control clearance.

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

Control zone. A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

Cruising level. A level maintained during a significant portion of a flight.

Current flight plan (CPL). The flight plan that reflects changes to the filed flight plan, if any, by subsequent ATC clearances.

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

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

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

Data link communications. A form of communication intended for the exchange of messages via a data link.

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

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

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

Declared capacity. 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. 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. The code word used to designate a distress phase.

Distress phase. 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. A clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft.

Emergency phase. A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

Final approach. 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:

1) a landing can be made; or

2) missed approach procedure is initiated.

Flight crew member. A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight information centre. A unit established to provide flight information service and alerting service.

Flight information region. An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight information service. A service provided for the purpose of giving advice and information usefulfor the safe and efficient conduct of flights.

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Note 1.— A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

a) when set to a QNH altimeter setting, will indicate altitude;

b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;

c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.

Note 2.— The terms "height" and "altitude", used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Flight plan. Specified information relative to an intended flight or portion of a flight of an aircraft.

Note 1.— The term flight plan may be prefixed by the words "preliminary", "filed", "current" or "operational" to indicate the context and different stages of a flight.

Note 2.— When the word "message" is used as a suffix to this term, it denotes the content and format of the flight plan data as transmitted.

Forecast. A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

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

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

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

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

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

Human performance. Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

IFR. The symbol used to designate the instrument flight rules.

IFR flight. A flight conducted in accordance with the instrument flight rules.

IMC. The symbol used to designate instrument meteorological conditions.

INCERFA. The code word used to designate an uncertainty phase.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note.— The types of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in Annex 13, Attachment C.

Instrument flight procedure design service. A service established for the design, documentation, validation, maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation.

Instrument meteorological conditions (IMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note.— The specified minima for visual meteorological conditions are contained in BCAR-2.

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

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

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

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

International NOTAM office. An office designated by a State for the exchange of NOTAM internationally.

Level. A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

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

Meteorological office. An office designated to provide meteorological service for international air navigation.

Meteorological service provider. The relevant entity designated to provide meteorological service for international and domestic air navigation.

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

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

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

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

Note 1.— The Performance-based Navigation (PBN) Manual *(ICAO Doc 9613), Volume II contains detailed guidance on navigation specifications.*

Note 2.— The term RNP, previously defined as "a statement of the navigation performance necessary for operation within a defined airspace," has been removed from this document as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this document is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refersto the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in ICAO Doc 9613.

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

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

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

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

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

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

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

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

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

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

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

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

Pilot-in-command. 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.

Printed communications. Communications which automatically provide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit.

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

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

Radiotelephony. A form of radio communication primarily intended for the exchange of information in the form of speech.

Reporting point. A specified geographical location in relation to which the position of an aircraft can be reported.

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

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

Rescue coordination centre. A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

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

Runway. A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway visual range (RVR). 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.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

SIGMET information. Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations.

Significant point. A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.

Note.— There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids.

Special VFR flight. A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

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

Taxiing. Movement of an aircraft on the surface of an aerodrome under its own power, excluding take- off and landing.

Terminal control area. A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

Track. The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

Traffic avoidance advice. Advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision.

Traffic information. 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. 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. 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.

Uncertainty phase. A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

VFR. The symbol used to designate the visual flight rules.

VFR flight. A flight conducted in accordance with the visual flight rules.

Visual meteorological conditions (VMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

Note.— The specified minima are contained in BACR-2.

VMC. The symbol used to designate visual meteorological conditions.

Waypoint. A specified geographical location used to define an area navigation route or the flight path ofan aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint. A waypoint which requires turn anticipation to allow tangential interception of thenext segment of a route or procedure, or

Flyover waypoint. A waypoint at which a turn is initiated in order to join the next segment of a routeor procedure.

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[*] ISO Standard
19104 — Geographic information — Terminology
19108 — Geographic information — Temporal schema

CHAPTER 2. GENERAL

2.1 Establishment of ATS provider

2.1.1 The designated air traffic services (ATS) provider shall determine those portions of the airspace and those aerodromes within the territory of Bhutan where air traffic services will be provided. Such services shall be established and provided in accordance with the provisions of this BCAR.

2.1.2 When the ATS provider provides air traffic services within a portion of the airspace of an adjacent State to ensure the provision of air traffic services for an aerodrome located within the territory of Bhutan, such services shall be provided in accordance with mutually agreed operational arrangements with the adjacent State, in addition to the provisions of this BCAR.

2.1.3 The ATS provider shall ensure that, where air traffic services are established, information are published as necessary to permit the utilization of such services.

2.2 Objectives of the air traffic services

The objectives of the air traffic services 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;

e) notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

2.3 Divisions of the air traffic services

The air traffic services shall comprise three services identified as follows.

2.3.1 The *air traffic control service*, to accomplish objectives a), b) and c) of 2.2, this service being divided in three parts as follows:

a) *Area control service:* the provision of air traffic control service for controlled flights, except for those parts of such flights described in 2.3.1 b) and c), in order to accomplish objectives a) and c) of 2.2;

b) *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 objectives a) and c) of 2.2;

c) Aerodrome *control service:* the provision of air traffic control service for aerodrome traffic, except for those parts of flights described in 2.3.1 b), in order to accomplish objectives a), b) and c) of 2.2.

2.3.2 The *flight information service*, to accomplish objective d) of 2.2.

2.3.3 The *alerting service*, to accomplish objective e) of 2.2.

2.4 Determination of the need for air traffic services

2.4.1 In determining the need for the provision of air traffic services, the ATS provider shall take into consideration of the following:

a) the types of air traffic involved;

b) the density of air traffic;

c) the meteorological conditions;

d) such other factors as may be relevant.

2.4.2 The ATS provider shall ensure that the carriage of airborne collision avoidance systems (ACAS) by aircraft in a given area is not a factor in determining the need for air traffic services in that area.

2.5 Designation of the portions of the airspace and controlled aerodromes where air traffic services will be provided

2.5.1 When the ATS provider intends to provide or provides air traffic services in particular portions of the airspace or at particular aerodromes, those portions of the airspace or those aerodromes shall be designated in relation to the air traffic services provided.

2.5.2 The ATS provider shall ensure that the designation of particular portions of the airspace or the particular aerodromes within its area of responsibility is as follows:

2.5.2.1 *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.

2.5.2.2 *Control areas and control zones*

2.5.2.2.1 Those portions of the airspace where it is determined that air traffic control service will be provided to IFR flights shall be designated as control areas or control zones.

2.5.2.2.1.1 Those portions of controlled airspace wherein 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.

2.5.2.2.2 Where designated within a flight information region, control areas and control zones shall form part of that flight information region.

2.5.2.3 *Controlled aerodromes.* Those aerodromes where it is determined that air traffic control service will be provided to aerodrome traffic shall be designated as controlled aerodromes.

2.6 Classification of airspaces

2.6.1 The ATS provider shall ensure that ATS airspaces are classified and designated in accordance with the following:

Class A. IFR flights only are permitted, all flights are provided with air traffic control service and areseparated from each other.

Class B. IFR and VFR flights are permitted, all flights are provided with air traffic control service and are separated from each other.

Class C. IFR and VFR flights are permitted, all flights are provided with air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights.

Class D. IFR and VFR flights are permitted and all flights are provided with air traffic control service, IFR flights are separated from other IFR flights and receive traffic information in respect of VFR flights, VFR flights receive traffic information in respect of all other flights.

Class E. IFR and VFR flights are permitted, IFR flights are provided with air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical. Class E shall not be used for control zones.

Class F. IFR and VFR flights are permitted, all participating IFR flights receive an air traffic advisory service and all flights receive flight information service if requested. Where air traffic advisory service is implemented, this is considered normally as a temporary measure only until such time as it can be replaced by air traffic control.

Class G. IFR and VFR flights are permitted and receive flight information service if requested.

2.6.2 The ATS provider shall ensure that the airspace is classified as appropriate to their needs.

2.6.3 The ATS provider shall ensure that the requirements for flights within each class of airspace are in accordance with Appendix 4.

Note.— Where the ATS airspaces adjoin vertically, i.e. one above the other, flights at a common level shall 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; Class C airspace less restrictive than Class B airspace, etc.

2.7 Performance-based navigation (PBN) operations

2.7.1 Prior to implementing performance-based navigation, the ATS provider shall:

a) establish navigation specifications; and

b) publish the navigation specifications in the AIP and in the ATS provider's operations manual.

2.7.2 The ATS provider shall ensure that the navigation specifications mentioned in para 2.7.1 shall:

a) include the designated areas, tracks or air traffic service routes on the basis of regional air navigation agreements when applicable; and

b) be appropriate to the level of communications, navigation and air traffic service provided in the airspace concerned.

2.7.3 The ATS provider should take into consideration the applicable guidance on Performance based Navigation (PBN) Manual (ICAO Doc 9613).

2.8 Performance-based communication (PBC) operations

2.8.1 Prior to implementing performance-based communication (PBC), the ATS provider shall establish and publish in the AIP the required communication performance (RCP) specifications that are:

1) based on regional air navigation agreements, when applicable; and

2) appropriate to the air traffic services provided.

2.8.2 The ATS provider should take into consideration the guidance on performance-based communication and surveillance (PBCS) Manual (ICAO Doc 9869).

2.9 Performance-based surveillance (PBS) operations

2.9.1 Prior to implementing performance-based surveillance (PBS), the ATS provider shall establish and publish in the AIP the required surveillance performance (RSP) specifications that are:

1) based on regional air navigation agreements, when applicable; and

2) appropriate to the air traffic services provided.

2.9.2 The ATS provider shall ensure that ATS units are provided with equipment capable of performance consistent with the prescribed RSP specification(s).

2.9.3 The ATS provider should take into consideration the guidance on performance-based communication and surveillance (PBCS) Manual (ICAO Doc 9869).

2.10 Establishment and designation of the units providing air traffic services

The ATS provider shall ensure that air traffic services are provided by units established and designated as follows:

2.10.1 The ATS provider shall establish flight information centres to provide flight information service and alerting service within the flight information region, unless the responsibility for 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.

Note.— This does not preclude delegating to other units the function of providing certain elements of the flight information service.

2.10.2 The ATS provider shall ensure that air traffic control units are established to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

2.11 Specifications for flight information regions, control areas and control zones

2.11.1 Delineation of airspace

[Reserved]

2.11.2 Flight information regions

2.11.2.1 The ATS provider shall ensure that flight information regions are delineated to cover the whole of the air route structure to be served by such regions.

2.11.2.2 The ATS provider shall ensure that a flight information region includes all airspace within its lateral limits, except as limited by an upper flight information region.

2.11.2.3 The ATS provider shall ensure that, where a flight information region is limited by an upper flight information region, the lower limit specified for the upper flight information region constitutes the upper vertical limit of the flight information region and coincides with a VFR cruising level of the tables in Appendix 3 of Annex 2 to the Convention on International Civil Aviation (referred in this BCAR as Chicago Convention).

2.11.3 Control areas

2.11.3.1 The ATS provider shall delineate control areas including, inter alia, airways and terminal control areas, so as to encompass sufficient airspace to contain the flight paths of those 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.

2.11.3.1.1 The ATS provider shall ensure that the control areas delineated are published in the AIP.

2.11.3.2 The ATS provider shall ensure that a lower limit of a control area isestablished at a height above the ground or water of not less than 200 m (700 ft).

2.11.3.2.1 The lower limit of a control area should, 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 2.11.3.2.

2.11.3.2.2 When the lower limit of a control area is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 of Annex 2 to the Chicago Convention. This implies that the selected VFR cruising level shall 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.

2.11.3.3 The ATS provider shall establish an upper limit of a control area when either:

a) air traffic control service will not be provided above such upper limit; or

b) 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.

2.11.3.4 The ATS provider shall ensure that, when an upper limit is established, such upper limit coincides with a VFR cruising level of the tables in Appendix 3 of Annex 2 to the Chicago Convention.

2.11.4 Flight information regions or control areas in the upper airspace

[Reserved]

2.11.5 Control zones

2.11.5.1 The ATS provider shall ensure that the lateral limits of control zones 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 instrument meteorological conditions.

2.11.5.1.1 The ATS provider shall ensure that the lateral limit established is published in the AIP.

2.11.5.2 The ATS provider shall ensure that the lateral limits of a control zone extend to at least 9.3 km (5 NM) from the centre of the aerodrome or aerodromes concerned in the directions from which approaches may be made.

2.11.5.3 The ATS provider shall ensure that, if a control zone is located within the lateral limits of a control area, it extends upwards from the surface of the earth to at least the lower limit of the control area.

2.11.5.4 [Reserved]

2.11.5.5 [Reserved]

2.12 Identification of air traffic services (ATS) units and airspaces

2.12.1 The ATS provider shall ensure that an area control centre or flight information centre is identified by the name of a nearby town or city or geographic feature.

2.12.2 The ATS provider shall ensure that an aerodrome control tower or approach control unit is identified by the name of the aerodrome at which it is located.

2.12.3 The ATS provider shall ensure that a control zone, control area or flight information region is identified by the name of the unit having jurisdiction over such airspace.

2.13 Establishment and identification of ATS routes

2.13.1 The ATS provider shall ensure that, when ATS routes are established, a protected airspace along each ATS route and a safe spacing between adjacent ATS routes are provided.

2.13.2 [Reserved]

2.13.3 The ATS provider shall ensure that ATS routes are identified by designators.

2.13.4 The ATS provider shall ensure that designators for ATS routes other than standard departure and arrival routes are selected in accordance with the principles set forth in Appendix 1.

2.13.5 The ATS provider shall ensure that standard departure and arrival routes and associated procedures are identified in accordance with the principles set forth in Appendix 3.

2.13.5.1 In establishing ATS routes, the ATS provider should take into consideration the guidance contained in the Air Traffic Services Planning Manual (ICAO Doc 9426).

2.13.5.2 In establishing ATS routes defined by VOR, the ATS provider should take into consideration the guidance contained in Attachment A of Annex 11 to Chicago Convention.

2.14 Establishment of change-over points

2.14.1 The ATS provider shall ensure that:

a) change-over points are 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

b) the establishment of change-over points are 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.

2.14.2 The ATS provider shall ensure that, unless otherwise established in relation to the performance of the navigation aids or frequency protection criteria, the change-over point on a route segment is 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.

2.14.3 In establishing change-over points, the ATS provider should take into consideration the guidance contained in Attachment A.

2.15 Establishment and identification of significant points

2.15.1 The ATS provider shall establish significant points for the purpose of defining an ATS route or instrument approach procedure and/or in relation to the requirements of air traffic services for information regarding the progress of aircraft in flight.

2.15.2 The ATS provider shall ensure that significant points are identified by designators.

2.15.3 The ATS provider shall ensure that significant points are established and identified in accordance with the principles set forth in Appendix 2.

2.16 Establishment and identification of standard routes for taxiing aircraft

2.16.1 Where necessary, the ATS provider shall establish standard routes for taxiing aircraft on an aerodrome between runways, aprons and maintenance areas. Such routes shall be direct, simple and where practicable, designed to avoid traffic conflicts.

2.16.2 The ATS provider shall ensure that standard routes for taxiing aircraft are identified by designators distinctively different from those of the runways and ATS routes.

2.17 Coordination between the air operator and ATS provider

2.17.1 The ATS provider shall ensure that ATS units, in carrying out their objectives, have due regard for the requirements of the operators consequent on their obligations as specified in ICAO Annex 6, and, if so required by the operators, makes available to them or their designated representatives such information as may be available to enable them or their designated representatives to carry out their responsibilities.

2.17.2 The ATS provider shall ensure that, when so requested by an operator, messages (including position reports) received by ATS units and relating to the operation of the aircraft for which operational control service is provided by that operator, so far as practicable, are made available immediately to the operator or a designated representative in accordance with locally agreed procedures.

Note.— For aircraft subjected to unlawful interference, the coordination shall be in accordance with 2.24.3.

2.18 Coordination between military authorities and ATS provider

2.18.1 The ATS provider shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft.

2.18.2 The ATS provider shall ensure that the coordination of activities potentially hazardous to civil aircraft is effected in accordance with 2.19.

2.18.3 The ATS provider shall make arrangements 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.

2.18.3.1 ATS units shall, either routinely or on request, in accordance with locally agreed procedures, provide appropriate military units with pertinent flight plan and other data concerning flights of civil aircraft. In order to eliminate or reduce the need for interceptions, ATS provider shall designate any areas or routes where the requirements in Chapter 3 of BCAR-2 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.

Note.— For aircraft subjected to unlawful interference, see 2.24.3 and 2.25.1.3.

2.18.3.2 The ATS provider shall establish special procedures to ensure that:

a) ATS units are notified if a military unit observes that an aircraft which is, or might be, a civil aircraft is approaching, or has entered, any area in which interception might become necessary;

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.

2.19 Coordination of activities potentially hazardous to civil aircraft

2.19.1 The ATS provider shall establish and apply appropriate procedures to:

a) identify and coordinate the activities that it considers to be potentially hazardous to civil aircraft in its area of responsibility; and

b) effect the coordination in 2.19.1 a) expeditiously in order to permit the timely promulgation of information regarding the activities in accordance with Chapter 6 of PANS-AIM (ICAO Doc 10066)

2.19.1.1 If the ATS provider is not that of Bhutan where the organization planning the activities is located, the ATS provider shall ensure that initial coordination is effected through the ATS provider responsible for the airspace over the State where the organization is located.

2.19.2 The objective of the coordination shall be to achieve the best arrangements which will avoid hazards to civil aircraft and minimize interference with the normal operations of such aircraft.

2.19.2.1 [Reserved]

2.19.3 The ATS provider shall conduct a safety risk assessment, as soon as practicable, for activities identified in 2.19.1 a) to ensure that appropriate risk mitigation measures are implemented.

Note 1.— Such risk mitigation measures may include, but would not be limited to, airspace restriction or temporary withdrawal of established ATS routes or portions thereof.

2.19.3.1 In conducting the safety risk assessment, the ATS provider shall ensure that its ATS units or organizations contribute to the safety risk assessment in order to facilitate consideration of all relevant safety-significant factors.

Note.— Guidance on collaborative decision making (CDM) processes for safety risk assessment and promulgation through NOTAM that could involve military authorities can be found in the Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations (ICAO Doc 9554).

2.19.4 The ATS provider shall be responsible for initiating the promulgation of information regarding the activities in accordance with 2.19.1 a).

2.19.5 [Reserved]

2.19.6 The ATS provider shall ensure that adequate steps are taken to prevent emission of laser beams from adversely affecting flight operations.

2.19.7 [Reserved]

2.20 Aeronautical data

2.20.1 In providing ATS-related raw aeronautical data and information to the AIS provider, the ATS provider shall ensure that such data and information comply with the accuracy and integrity classifications required to meet the needs of end users, as specified in Appendix 1 of PANS-AIM (ICAO Doc 10066).

2.20.2 The ATS provider shall ensure that digital data error detection techniques are used during the transmission and/or storage of aeronautical data and digital data sets, as specified in PANS-AIM (ICAO Doc 10066).

2.21 Coordination between meteorological service provider and ATS provider

2.21.1 The ATS provider shall establish arrangements with the meteorological service provider to enable its ATS personnel to expeditiously report to the meteorological service provider on:

a) in addition to observations from indicating instruments, such other meteorological elements as may be agreed upon, if observed by ATS personnel or communicated by aircraft;

b) 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) pertinent information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud.

2.21.2 The ATS provider shall establish and maintain close coordination between area control centres, flight information centres and associated meteorological watch offices to ensure that information on volcanic ash included in NOTAM and SIGMET messages is consistent.

2.22 Coordination between aeronautical information services and ATS provider

2.22.1 To ensure that aeronautical information services (AIS) units obtain information necessary to provide up-to-date pre-flight information and to meet the need for in-flight information, the ATS provider shall establish arrangements with AIS units to enable ATS units to expeditiously report to the responsible AIS unit, with minimum of delay, on:

a) information on aerodrome conditions;

b) the operational status of associated facilities, services and navigation aids within their area ofresponsibility;

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.

2.22.2 Before introducing changes to the air navigation system, the ATS provider shall ensure timely provision of aeronautical information or data to its AIS provider to enable the AIS provider to prepare, produce and issue the relevant aeronautical information for promulgation.

2.22.3 The ATS provider shall observe the predetermined, internationally agreed Aeronautical Information Regulation and Control (AIRAC) effective dates when submitting the raw aeronautical information or data to the AIS provider in accordance with the requirements Chapter 6 of BCAR-15.

2.22.4 In providing raw aeronautical information or data to the AIS provider, the ATS provider shall take into account accuracy and integrity requirements necessary to meet the needs of the end-user of aeronautical data, as specified in Appendix 1 of PANS-AIM (ICAO Doc 10066).

Note 1. — Specifications concerning the accuracy and integrity classification of air traffic services- related aeronautical data are contained in PANS-AIM (ICAO Doc 10066), Appendix 1.

Note 2. — Specifications for the issue of a NOTAM, SNOWTAM and ASHTAM are contained in BCAR - 15, Chapter 6.

Note 3.— Reports of volcanic activity comprise the information detailed in BCAR-3, Chapter 4.

Note 4.— AIRAC information is distributed by the aeronautical information service at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

Note 5.— The schedule of the predetermined, internationally agreed AIRAC common effective dates at intervals of 28 days and guidance for the AIRAC use are contained in the Aeronautical Information Services Manual (ICAO Doc 8126, Chapter 2, 2.6).

2.23 Minimum flight altitudes

2.23.1 The ATS provider shall determine minimum flight altitudes for each air traffic service route and control area over the ATS provider's area of responsibility.

2.23.2 The minimum flight altitudes determined in 2.23.1 shall provide a minimum clearance above the controlling obstacle located within the areas concerned, in accordance with obstacle clearance criteria contained in Procedures for Air Navigation Services – Aircraft Operations (ICAO Doc 8168) Volume II.

2.23.3 The minimum flight altitudes determined in 2.23.1 shall be published in the AIP.

2.24 Service to aircraft in the event of an emergency

2.24.1 The ATS provider shall ensure that an aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference, is given maximum consideration, assistance and priority over other aircraft as may be necessitated by the circumstances.

2.24.1.1 In communications between ATS units and aircraft in the event of an emergency, Human Factors principles shall be observed in accordance with the guidance contained in Human Factors TrainingManual (ICAO Doc 9683).

2.24.2 When an occurrence of unlawful interference with an aircraft takes place or is suspected, the ATS provider shall ensure that ATS units:

a) attend promptly to requests by the aircraft;

b) continue to transmit information pertinent to the safe conduct of the flight;

c) take necessary action to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft;

d) immediately inform the BCAA; and

e) exchange necessary information with the air operator of that aircraft or its designated representative.

2.25 In-flight contingencies

2.25.1 Strayed or unidentified aircraft

Note 1.— The terms "strayed aircraft" and "unidentified aircraft" in this paragraph have the following meanings:

Strayed aircraft. An aircraft which has deviated significantly from its intended track or which reports that it is lost.

Unidentified aircraft. An aircraft which has been observed or reported to be operating in a given area but whose identity has not been established.

Note 2.— An aircraft may be considered, at the same time, as a "strayed aircraft" by one unit and as an "unidentified aircraft" by another unit.

Note 3.— A strayed or unidentified aircraft may be suspected as being the subject of unlawful interference.

2.25.1.1 The ATS provider shall ensure that ss soon as an ATS unit becomes aware of a strayed aircraft, it takes all necessary steps as outlined in 2.25.1.1.1 and 2.25.1.1.2 to assist the aircraft and to safeguard its flight.

2.25.1.1.1 If the aircraft's position is not known, the ATS unit shall:

a) attempt to establish two-way communication with the aircraft, unless such communication already exists;

b) use all available means to determine its position;

c) 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;

d) inform, in accordance with locally agreed procedures, appropriate military units and provide them with pertinent flight plan and other data concerning strayed aircraft;

e) request from the units referred to in c) and d) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position.

Note.— The requirements in d) and e) apply also to ATS units informed in accordance with c).

2.25.1.1.2 When the aircraft's position is established, the ATS unit shall:

a) advise the aircraft of its position and corrective action to be taken; and

b) provide, as necessary, other ATS units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft.

2.25.1.2 The ATS provider shall ensure that, as soon as an ATS unit becomes aware of an unidentified aircraft in its area, it shall take the following steps as are appropriate in the circumstances:

a) attempt to establish two-way communication with the aircraft;

b) 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;

c) 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;

d) attempt to obtain information from other aircraft in the area.

2.25.1.2.1 The ATS unit shall, as necessary, inform the appropriate military unit as soon as the identity of the aircraft has been established.

2.25.1.3 Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the ATS unit shall immediately inform BCAA and other relevant authorities, in accordance with procedures for unlawful interference, as agreed between the ATS provider and such authorities.

2.25.2 Interception of civil aircraft

2.25.2.1 As soon as an air traffic services unit learns that an aircraft is being intercepted in its area of responsibility, it shall take such of the following steps as are appropriate in the circumstances:

a) 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;

b) inform the pilot of the intercepted aircraft of the interception;

c) establish contact with the intercept control unit maintaining two-way communication with the intercepting aircraft and provide it with available information concerning the aircraft;

d) relay messages between the intercepting aircraft or the intercept control unit and the intercepted aircraft, as necessary;

e) in close coordination with the intercept control unit take all necessary steps to ensure the safetyof the intercepted aircraft;

f) inform ATS units serving adjacent flight information regions if it appears that the aircraft has strayed from such adjacent flight information regions.

2.25.2.2 As soon as an air traffic services unit learns that an aircraft is being intercepted outside its area of responsibility, it shall take such of the following steps as are appropriate in the circumstances:

a) inform the ATS unit serving the airspace in which the interception is taking place, providing this unit with available information that will assist in identifying the aircraft and requesting it to take action in accordance with 2.25.2.1;

b) relay messages between the intercepted aircraft and the appropriate ATS unit, the interceptcontrol unit or the intercepting aircraft.

2.26 Time in air traffic services

2.26.1 The ATS provider shall ensure that its ATS units use Coordinated Universal Time (UTC) and that time is expressed in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

2.26.2 The ATS provider shall ensure that its ATS units are equipped with clocks indicating the time in hours, minutes and seconds, clearly visible from each operating position in the unit concerned.

2.26.3 The ATS provider shall ensure that its ATS unit clocks and other time-recording devices are checked as necessary to ensure correct time to within plus or minus 30 seconds of UTC. Wherever data link communications are utilized by an air traffic services unit, clocks and other time-recording devices shall be checked as necessary to ensure correct time to within 1 second of UTC.

2.26.4 The ATS provider shall ensure that the correct time is obtained from a standard time station or, if not possible, from another unit which has obtained the correct time from such station.

2.26.5 Aerodrome control towers shall, prior to an aircraft taxiing for take-off, provide the pilot with the correct time, unless arrangements have been made for the pilot to obtain it from other sources. ATS units shall, in addition, provide aircraft with the correct time on request. Time checks shall be given to the nearest half minute.

2.27 Establishment of requirements for carriage and operation of pressure-altitude reporting transponders

The requirements for carriage and operation of pressure-altitude reporting transponders within defined portions of airspace are established in BCAR - Air Operations.

Note.— This provision is intended to improve the effectiveness of air traffic services as well as airborne collision avoidance systems.

2.28 Fatigue management

2.28.1 For the purpose of managing fatigue-related safety risks, the ATS provider shall implement and maintain a fatigue management programme (“FMP”).

2.28.2 The FMP established under sub-paragraph 2.28.1 shall:

a) develop a roster:

1) that is commensurate with the air traffic control service provided; and

2) that specifies:

(A) the scheduling limits, which shall be in accordance with the scheduling limits specified in the Appendix 5; or

(B) any variation to the scheduling limits that is approved by the BCAA under paragraph 2.28.9;

b) include procedures for compiling evidence to be submitted to the BCAA to demonstrate compliance with the scheduling limits mentioned in sub-paragraph 2.28.2(a)(ii);

c) include procedures to familiarise the ATS provider's personnel with the principles of fatigue management and the ATS provider's policies with regard to fatigue management;

d) include procedures for assigning unscheduled duties that ensure that air traffic controllers are able to avoid extended periods of being awake; and

e) include procedures to deviate from the scheduling limits mentioned in sub paragraph 2.28.2(a)(ii) to address any additional risks associated with sudden and unforeseen operational circumstances.

2.28.3 The ATS provider shall submit the FMP established under paragraph 2.28.2 for the approval of the BCAA, and the BCAA may approve the FMP subject to such conditions as the BCAA considers necessary.

2.28.4 The ATS provider shall:

a) make such amendments, as may be approved by the BCAA, to the FMP as may be necessary to maintain the accuracy of the information in the FMP and keep its contents up-to-date; and

b) where required by the BCAA, make such amendments to the FMP within such time as the BCAA may specify, for the purpose of:

i) maintaining the accuracy of the FMP; or

ii) managing any fatigue-related risks in the provision of air traffic control.

2.28.5 Except as provided in paragraph 2.28.9, the ATS provider shall not vary the scheduling limits specified in the FMP unless it has obtained the approval of the BCAA.

2.28.6 An application for approval to vary a scheduling limit specified in the FMP shall contain the following details:

a) the information set out in paragraph 2.28.7;

b) an implementation plan to demonstrate how the ATS provider intends to implement the variation during the period in which the variation will be effective;

c) the procedures to document and record the variation.

2.28.7 For the purpose of sub-paragraph 2.28.6(a), the ATS provider shall provide the following information:

a) the reason for the variation;

b) the extent of the variation;

c) when the variation is to take effect; and

d) a risk assessment that demonstrates that any associated risk will be managed to attain an equivalent level of safety.

2.28.8 The BCAA may approve an application to vary a scheduling limit in the FMP subject to such conditions as the BCAA considers appropriate.

2.28.9 When the ATS provider vary a scheduling limits mentioned in sub-paragraph 2.28.2(a)(ii) to avoid risks associated with sudden, unforeseen operational circumstances and without prior approval from the BCAA, the ATS provider shall provide the following information to the BCAA within 72 hours of making the deviation:

a) the reason for the deviation;

b) the extent of the deviation;

c) when the deviation took place; and

d) the mitigation measures carried out to attain an equivalent level of safety after the deviation took place.

2.29 Safety management

2.29.1 The ATS provider shall establish and implement a safety management system (SMS) in accordance with applicable requirements contained in BCAT-ATM/ANS and BCAR-19.

2.29.2 The ATS provider shall ensure any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, are only effected after a safety risk assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the ATS provider shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.

Note.— Further guidance is contained in the Safety Management Manual (SMM) (ICAO Doc 9859) and associated procedures are contained in the PANS-ATM (ICAO Doc 4444) and BCAA's Standards and Guidance for ATM.

2.30 Common reference systems

2.30.1 Horizontal reference system

2.30.1.1 The ATS provider shall use World Geodetic System — 1984 (WGS-84) as the horizontal (geodetic) reference system for air navigation.

2.30.1.2 The ATS provider shall ensure that reported aeronautical geographical coordinates (indicating latitude and longitude) are expressed in terms of the WGS-84 geodetic reference datum.

Note.— Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System — 1984 (WGS-84) Manual *(ICAO Doc 9674)*.

2.30.2 Vertical reference system

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

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

2.30.3 Temporal reference system

2.30.3.1 The ATS provider shall use the Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporalreference system for air navigation.

2.30.3.2 When a different temporal reference system is used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP).

2.31 Language proficiency

2.31.1 An ATS provider shall ensure that air traffic controllers speak and understand thelanguage(s) used for radiotelephony communications as specified in BCAR-Personnel Licensing.

2.31.2 Except when communications between air traffic control units are conducted in a mutually agreed language, the English language shall be used for such communications.

2.32 Contingency arrangements

2.32.1 The ATS provider shall develop and apply appropriate 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.

2.32.2 The ATS provider shall ensure that contingency plans developed in accordance with 2.32.1 provide for the continuity of operations in the event of natural disasters and public health emergencies.

2.32.3 The ATS provider shall include the following in the contingency plans mentioned in 2.32.1:

a) contingency plans for each of its ATS units; and

b) contingency plans for operations involving adjacent flight information regions.

2.32.4 The ATS provider shall ensure that the contingency plans in 2.32.3 a) describe the transition from normal operations to contingency operations, and transition from contingency operations back to normal operations.

2.32.5 The ATS provider shall conduct regular exercises to assess the contingency plans in 2.32.3 a) and to ensure that these contingency plans continue to be relevant, and that the relevant ATS personnel continue to be familiar with these contingency plans.

2.32.6 The ATS provider shall develop the contingency plans in 2.32.3 b) in close coordination with the ATS providers responsible for the provision of air traffic services in adjacent flight information

regions and with the airspace users concerned, with the assistance of the International Civil Aviation Organisation as necessary.

Note 1.— Guidance material relating to the development, promulgation and implementation of contingency plans is contained in Attachment C of Annex 11 to Chicago Convention.

Note 2.— Contingency plans may constitute a temporary deviation from the approved regional air navigation plans; such deviations are approved, as necessary, by the President of the ICAO Council on behalf of the Council.

2.33 Identification and delineation of prohibited, restricted and danger areas

2.33.1 The ATS provider shall ensure that each prohibited area, restricted area, or danger area established within its area of responsibility is assigned an identification code and that full details are promulgated in accordance with PANS-AIM (ICAO Doc 10066), Appendix 2, ENR 5.1.

2.33.2 The ATS provider shall use the identification code assigned to identify the area in all subsequent notifications pertaining to that area.

2.33.3 The ATS provider shall ensure that the identification code composes of a group of letters and figures as follows:

a) nationality letters for location indicators assigned to Bhutan as contained in Location Indicators (ICAO Doc 7910);

b) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and

c) a number, unduplicated within Bhutan.

2.33.4 The ATS provider shall ensure that, to avoid confusion, identification codes are not reused for a period of at least one year after the area to which they refer is no longer declared a prohibited area, a restricted area or a danger area.

2.33.5 [Reserved].

2.34 Instrument flight procedure design service

The instrument flight procedure design services shall be provided in accordance with Appendix 7 and BCAR-Instrument Flight Procedures (IFP).

CHAPTER 3. AIR TRAFFIC CONTROL SERVICE

3.1 Application

The ATS provider shall ensure that air traffic control service is provided:

a) to all IFR flights in airspace Classes A, B, C, D and E;

b) to all VFR flights in airspace Classes B, C and D;

c) to all special VFR flights;

d) to all aerodrome traffic at controlled aerodromes.

3.2 Provision of air traffic control service

The ATS provider shall ensure that the parts of air traffic control service described in 2.3.1 is provided by the various units as follows:

a) Area control service:

1) by an area control centre; or

2) 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:

1) by an aerodrome control tower or area control centre when it is necessary or desirable to combine under the responsibility of one unit the functions of the approach control service with those of the aerodrome control service or the area control service;

2) by an approach control unit when it is necessary or desirable to establish a separate unit.

c) Aerodrome control service: by an aerodrome control tower.

Note.— The task of providing specified services on the apron, e.g. apron management service, may beassigned to an aerodrome control tower or to a separate unit.

3.3 Operation of air traffic control service

3.3.1 The ATS provider shall ensure that, in order to provide air traffic control service, an air traffic control unit:

a) is provided with information on the intended movement of each aircraft, or variations there from, and with current information on the actual progress of each aircraft;

b) determines from the information received, the relative positions of known aircraft to each other;

c) issues clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic;

d) coordinates clearances as necessary with other units:

1) whenever an aircraft might otherwise conflict with traffic operated under the control of suchother units;

2) before transferring control of an aircraft to such other units.

3.3.2 The ATS unit shall ensure that information on aircraft movements, together with a record of air traffic control clearances issued to such aircraft, is displayed as to permit ready analysis in order to maintain an efficient flow of air traffic with adequate separation between aircraft.

3.3.3 [Reserved]

3.3.4 The ATS provider shall ensure that clearances issued by air traffic control units provide separation:

a) between all flights in airspace Classes A and B;

b) between IFR flights in airspace Classes C, D and E;

c) between IFR flights and VFR flights in airspace Class C;

d) between IFR flights and special VFR flights;

e) between special VFR flights when so prescribed by the ATS provider,

except that, when requested by an aircraft and if so prescribed by the ATS provider for the cases listed under b) above in airspace Classes D and E, a flight may be cleared without separation being so provided in respect of a specific portion of the flight conducted in visual meteorological conditions.

3.3.5 The ATS provider shall ensure that separation by an air traffic control unit is obtained by at least one of the following:

a) vertical separation, obtained by assigning different levels selected from:

1) the appropriate table of cruising levels in Appendix 3 of Annex 2 to the Chicago Convention; or

2) a modified table of cruising levels, when so prescribed in accordance with Appendix 3 of Annex 2 to the Chicago Convention for flight above FL 410,

except that the correlation of levels to track as prescribed therein shall not apply whenever

otherwise indicated in appropriate aeronautical information publications or air traffic control clearances;

b) horizontal separation, obtained by providing:

1) longitudinal separation, by maintaining an interval between aircraft operating along the same, converging or reciprocal tracks, expressed in time or distance; or

2) lateral separation, by maintaining aircraft on different routes or in different geographical areas;

c) composite separation, consisting of a combination of vertical separation and one of the other forms of separation contained in b) above, 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. Composite separation shall only be applied on the basis of regional air navigation agreements.

Note.— Guidance material relating to the implementation of composite lateral/vertical separation is contained in the Air Traffic Services Planning Manual (ICAO Doc 9426).

3.3.5.1 For all airspace where a reduced vertical separation minimum of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, the ATS provider shall:

a) ensure that it monitors and collects data on the height-keeping performance and any height deviation of aircraft operating at these RVSM levels; and

b) participates in a regional programme to submit the data collected in accordance with 3.3.5.1 a) for the purpose of conducting analyses of aircraft group performances.

Note.— Guidance material relating to vertical separation and monitoring of height-keeping performance is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc 9574).

3.3.5.2 [Reserved]

3.3.5.3 [Reserved]

3.4 Separation minima

3.4.1 The ATS provider shall develop and implement appropriate procedures for its air traffic control units to apply separation minima within a given portion of airspace as follows:

a) the separation minima shall be selected from those prescribed by the provisions of the PANS-ATM (ICAO Doc 4444) and the *Regional Supplementary Procedures* as applicable under the prevailing circumstances except that, where types of aids are used or circumstances prevail which are not covered by current ICAO provisions, other separation minima shall be established as necessary by:

1) the ATS provider, following consultation with operators, for routes or portions of

routes contained within the sovereign airspace of Bhutan;

2) regional air navigation agreements for routes or portions of routes contained within airspace over the high seas or over areas of undetermined sovereignty.

Note.— Details of current separation minima prescribed by ICAO are contained in the PANS-ATM (ICAO Doc 4444) and the Regional Supplementary Procedures (ICAO Doc 7030).

b) the selection of separation minima shall be made in consultation between the ATS provider responsible for the provision of air traffic services in neighboring airspace when:

1) traffic will pass from one into the other of the neighboring airspaces;

2) routes are closer to the common boundary of the neighboring airspaces than the separationminima 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 separation between aircraft operating on both sides of the common boundary.

3.4.2 The ATS provider shall ensure that the details of the selected separation minima and of their areas of application are notified:

a) to the ATS units concerned; and

b) 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.

3.5 Responsibility for control

3.5.1 Responsibility for control of individual flights

The ATS provider shall ensure that a controlled flight is under the control of only one air traffic control unit at any given time.

3.5.2 Responsibility for control within a given block of airspace

3.5.2.1 The ATS provider shall ensure that the responsibility for the control of all aircraft operating within a given block of airspace is assigned to one air traffic control unit.

3.5.2.2 When delegating control of an aircraft or groups of aircraft to other air traffic control units, the ATS provider shall ensure that coordination between all air traffic control units concerned is assured.

3.6 Transfer of responsibility for control

3.6.1 Place or time of transfer

The ATS provider shall ensure that the responsibility for the control of an aircraft is transferred from one air traffic control unit to another as follows:

3.6.1.1 *Between two units providing area control service.* The 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 controlarea boundary as estimated by the area control centre having control of the aircraft or at such other pointor time as has been agreed between the two units.

3.6.1.2 *Between a unit providing area control service and a unit providing approach control service.* The responsibility for the control of an aircraft shall be transferred from a unit providing area control service to a unit providing approach control service, and vice versa, at a point or time agreed between the two units.

3.6.1.3 *Between a unit providing approach control service and an aerodrome control tower*

3.6.1.3.1 *Arriving aircraft*. The responsibility for the control of an arriving aircraft shall be transferred from the unit providing approach control service to the aerodrome control tower, when the aircraft:

a) is in the vicinity of the aerodrome, and:

1) it is considered that approach and landing will be completed in visual reference to theground, or

2) it 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.

Note.— Even though there is an approach control unit, control of certain flights may be transferred directly from an area control centre to an aerodrome control tower and vice versa, by prior arrangement between the units concerned for the relevant part of approach control service to be provided by the area control centre or the aerodrome control tower, as applicable.

3.6.1.3.2 *Departing aircraft.* The 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:

1) prior to the time the aircraft leaves the vicinity of the aerodrome, or

2) prior to the aircraft entering instrument meteorological conditions, or

3) at a prescribed point or level,

as specified in letters of agreement or ATS unit instructions;

b) When instrument meteorological conditions prevail at the aerodrome:

1) immediately after the aircraft is airborne, or

2) at a prescribed point or level,

as specified in letters of agreement or ATS unit instructions.

3.6.1.4 *Between control sectors/positions within the same air traffic control unit*

The responsibility for control of an aircraft shall be transferred from one control sector/position to another control sector/position within the same air traffic control unit at a point, level or time, as specified in ATS unit instructions.

3.6.2 Coordination of transfer

3.6.2.1 The ATS provider shall ensure that the responsibility for control of an aircraft is transferred from one air traffic control unit to *another* only with the consent of the accepting control unit in accordance with 3.6.2.2, 3.6.2.2.1, 3.6.2.2.2 and 3.6.2.3.

3.6.2.2 The ATS provider shall ensure that the transferring control unit communicates to the accepting control unit the appropriate parts of the current flight plan and any control information pertinent to the transfer requested.

3.6.2.2.1 Where transfer of control is to be effected using ADS-B data, the ATS provider shall ensure that the control information pertinent to the transfer includes information regarding the position and, if required, the track and speed of the aircraft, as observed by radar or ADS-B immediately prior to the transfer.

3.6.2.2.2 Where transfer of control is to be effected using ADS-C data, the ATS provider shall ensure that the control information pertinent to the transfer includes the four-dimensional position and other information as necessary.

3.6.2.3 The ATS provider shall ensure that the accepting control unit:

a) indicates its ability to accept control of the aircraft on the terms specified by the transferring control unit, unless by prior agreement between the two units concerned, the absence of any suchindication is understood to signify acceptance of the terms specified, or indicate any necessary changes thereto; and

b) specifies any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer.

3.6.2.4 Unless otherwise specified in an agreement between the accepting control unit and the transferring control unit, the ATS provider shall ensure that the accepting control unit notifies the transferring control unit that it has:

a) established two-way voice and/or data link communications with the aircraft concerned;

b) assumed control of the aircraft.

3.6.2.5 The ATS provider shall specify the applicable coordination procedures, including transfer of control points, in letters of agreement and ATS unit instructions as appropriate.

3.7 Air traffic control clearances

The ATS provider shall ensure that the air traffic control clearances are based solely on the requirements for providing air traffic controlservice.

3.7.1 Contents of clearances

3.7.1.1 An air traffic control clearance shall indicate:

a) aircraft identification as shown in the flight plan;

b) clearance limit;

c) route of flight;

d) level(s) of flight for the entire route or part thereof and changes of levels if required;

Note.— If the clearance for the levels covers only part of the route, it is important for the air traffic control unit to specify a point to which the part of the clearance regarding levels applies whenever necessary to ensure compliance with 3.6.5.2.2 a) of BCAR - 2.

e) any necessary instructions or information on other matters such as approach or departure manoeuvres, communications and the time of expiry of the clearance.

Note.— The time of expiry of the clearance indicates the time after which the clearance will beautomatically cancelled if the flight has not been commenced.

3.7.1.2 [Reserved]

3.7.2 Clearances for transonic flight

3.7.2.1 The air traffic control clearance relating to the transonic acceleration phase of a supersonic flight shall extend at least to the end of that phase.

3.7.2.2 [Reserved]

3.7.3 Read-back of clearances and safety-related information

3.7.3.1 The ATS provider shall develop and implement appropriate procedures to ensure that its air traffic controllers obtain read-back from the flight crew on the following safety-related parts of air traffic control clearances and instructions, which are transmitted by voice from the air traffic controller to the flight crew:

a) ATC route clearances;

b) clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack onany runway; and

c) 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.

3.7.3.1.1 The procedure established in accordance with 3.7.3.1 shall ensure that the air traffic controllers obtain read-back or acknowledgement from the flight crew in a manner to clearly indicate that other clearances or instructions, including conditional clearances, have been understood and will be complied with.

3.7.3.1.2 The procedure established in accordance with 3.7.3.1 shall ensure that air traffic controllers listen to the read-back specified in 3.7.3.1 and 3.7.3.1.1 to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and take immediate action to correct any discrepancies revealed by the read-back.

3.7.3.2 Unless specified by the ATS provider, 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 BCAR-10, Volume II, and the PANS-ATM (ICAO Doc 4444), Chapter 14.

3.7.3.3 The procedure established in accordance with 3.7.3.1 shall ensure that air traffic controllers obtain read-back from vehicle drivers operating or intending to operate on the manoeuvring area, on safety-related parts of instructions to enter, hold short of, cross and operate on any operational runway or taxiway, which are transmitted by voice from the air traffic controller to the vehicle drivers.

3.7.3.4 The procedure established in accordance with 3.7.3.1 shall ensure that the air traffic controllers listen to the read-back to ascertain that the instruction has been correctly acknowledged by the vehicle driver and take immediate action to correct any discrepanciesrevealed by the read-back.

3.7.3.5 In implementing any measures to increase its declared capacity, the ATS provider shall apply its safety management system (SMS) procedures to ensure that safety levels are not jeopardised.

3.7.3.6 The ATS provider shall periodically review its declared capacities to ensure that the declared capacities continue to be relevant.

3.7.4 Coordination of air traffic control clearances

The ATS provider shall ensure that an air traffic control clearance is coordinated between its air traffic control units to cover the entire route of an aircraft or a specified portion thereof as follows.

3.7.4.1 An aircraft shall be cleared for the entire route to the aerodrome of first intended landing:

a) when it has been possible, prior to departure, to coordinate the clearance between all the units under whose control the aircraft will come; or

b) when there is reasonable assurance that prior coordination will be effected between those units under whose control the aircraft will subsequently come.

Note.— Where a clearance is issued covering the initial part of the flight solely as a means of expeditingdeparting traffic, the succeeding en-route clearance will be as specified above even though the aerodrome of first intended landing is under the jurisdiction of an area control centre other than theone issuing the en-route clearance.

3.7.4.2 When coordination as in 3.7.4.1 has not been achieved or is not anticipated, the aircraft shall be cleared only to that point where coordination is reasonably assured; prior to reaching such point, or at such point, the aircraft shall receive further clearance, holding instructions being issued as appropriate.

3.7.4.2.1 Where the ATS provider permits an aircraft to receive a downstream clearance, it shall ensure that:

a) the aircraft contacts a downstream air traffic control unit for the purpose of receiving a downstream clearance prior to the transfer of control point;

b) its air traffic control unit maintains the necessary two-way communication with that aircraft while the aircraft obtains a downstream clearance.

c) a clearance issued as a downstream clearance is clearly identifiable as such to the pilot; and

d) unless prior coordination has been effected, a downstream clearance does not affect the aircraft's original flight profile outside the airspace of the air traffic control unit issuing the downstream clearance.

Note.— Requirements relating to the application of downstream clearance delivery service are specified in BCAR - 10, Volume II. Guidance material is contained in the Manual of Air Traffic Services Data Link Applications (ICAO Doc 9694).

e) [Reserved]

3.7.4.3 When an aircraft intends to depart from an aerodrome within a control area to enter another control area within a period of thirty minutes, or such other specific period of time as has been agreed between the area control centres concerned, the ATS provider shall ensure that coordination with the subsequent area control centre is effected prior to issuance of the departure clearance.

3.7.4.4 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. The ATS provider shall ensure that such clearance or revisions thereto applies only to those portions of the flight conducted within controlled airspace.

3.7.5 ATS system capacity and Air traffic flow management

3.7.5.1 The ATS provider shall ensure that:

a) that the number of aircraft provided with an air traffic control service by the ATS provider's air traffic control units does not exceed that which can be safely handled under its prevailing circumstances;

b) it declares in its operations manual the ATS provider's capacity for providing air traffic control service with respect to each area and approach control sector and each aerodrome;

c) for the purpose of declaring the capacity mentioned in 3.7.5.1 a), the ATS provider takes into consideration factors such as weather, air traffic control unit configuration, available personnel and equipment, and any other factors that may affect the workload of a controller responsible for that control sector or aerodrome;

d) the methodology for determining the capacity of the air traffic control services declared under 3.7.5.1 a) are documented; and

e) air traffic flow management (ATFM) measures are implemented for any airspace or aerodrome where air traffic demand at times exceeds, or is expected to exceed, the declared capacity of the air traffic control services concerned.

3.7.5.2 [Reserved]

3.7.5.3 The measures to be implemented pursuant to 3.7.5.1 e) shall include:

a) measures for informing the air traffic service units concerned; and

b) advising flight crews and operators of affected aircraft about the delays expected or the restrictions that will be applied.

3.8 Control of persons and vehicles at aerodromes

3.8.1 The ATS provider shall establish procedures with the aerodrome operator to ensure that its aerodrome control towers have control over the movement of persons, vehicles and towed aircraft on the maneuvering area of an aerodrome to avoid hazard to them or to aircraft landing, taxiing or taking off.

3.8.2 In conditions where low visibility procedures are in operation at aerodromes, the ATS provider shall ensure that:

a) persons and vehicles operating on the maneuvering area of an aerodrome are restricted to the essential minimum;

b) subject to the provisions in 3.8.3, the minimum separation between vehicles and taxiing aircraft is prescribed by the ATS provider taking into account the aids available;

c) [Reserved].

Note.— The period of application of low visibility procedures is determined in accordance with ATS unit instructions. Guidance on low visibility operations on an aerodrome is contained in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (ICAO Doc 9476).

3.8.3 The ATS provider shall establish procedures with the aerodrome operator to ensure that emergency vehicles proceeding to the assistance of an aircraft in distress are afforded priority over all other surface movement traffic.

3.8.4 Subject to the provisions in 3.8.3, the ATS provider shall establish procedures with the aerodrome operator to ensure that vehicles on the maneuvering area 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;

c) vehicles shall give way to other vehicles in accordance with ATS unit instructions;

d) notwithstanding the provisions of a), b) and c), all vehicles, including vehicles towing aircraft, shall comply with instructions issued by the aerodrome control tower.

3.9 Provision of radar and ADS-B

Where radar and ADS-B ground systems are used for the provision of air traffic control service, the ATS provider shall ensure that it provides for the display of safety-related alerts and warnings, including conflict alert, conflict prediction, minimum safe altitude warning and unintentionally duplicated SSR codes.

3.10 Use of surface movement radar (SMR)

[Reserved]

CHAPTER 4. FLIGHT INFORMATION SERVICE

4.1 Application

4.1.1 The ATS provider shall provide flight information service to all aircraft which are likely to be affected by the information and which are:

a) provided with air traffic control service; or

b) otherwise known to the relevant ATS units.

Note.— Flight information service does not relieve the pilot-in-command of an aircraft of any responsibilities and the pilot-in-command has to make the final decision regarding any suggested alteration of flight plan.

4.1.2 Where ATS units provide both flight information service and air traffic control service, the ATS provider shall ensure that the provision of air traffic control service has precedence over the provision of flight information service whenever the provision of air traffic control service so requires.

Note.— It is recognized that in certain circumstances aircraft on final approach, landing, take-off and climb may require to receive without delay essential information other than that pertaining to the provision of air traffic control service.

4.2 Scope of flight information service

4.2.1 The ATS provider shall ensure that the provision of flight information service includes the provision of 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 when they are affected by snow, iceor significant depth of water;

f) information on unmanned free balloons; and

g) any other information likely to affect safety.

4.2.2 In addition to the information outlined in 4.2.1, the ATS provider shall ensure that flight information service provided to flights includes 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;

c) for flight over water areas, in so far as practicable and when requested by a pilot, any available information such as radio call sign, position, true track, speed, etc., of surface vessels in the area.

Note 1.— The information in b), including only known aircraft, the presence of which might constitute a collision hazard to the aircraft informed, will sometimes be incomplete and air traffic services cannot assume responsibility for its issuance at all times or for its accuracy.

Note 2.— When there is a need to supplement collision hazard information provided in compliance with b), or in case of temporary disruption of flight information service, traffic information broadcasts by aircraft may be applied in designated airspaces. Guidance on traffic information broadcasts by aircraft and related operating procedures is contained in Attachment B of Annex 11 to Chicago Convention.

4.2.3 The ATS provider shall ensure that its ATS units transmits, 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 ATS provider concerned.

4.2.4 When providing flight information service to VFR flights, the ATS provider shall include, in addition to that the information outlined in 4.2.1 and 4.2.2, the provision of available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable.

4.2.5 Notwithstanding the requirements in 4.2.1, 4.2.2, 4.2.3 and 4.2.4, the ATS provider shall comply with all requirements contained in the Bhutan Civil Aviation Requirements for Aerodrome Flight Information Service (BCAR-AFIS) for the provision of flight information service.

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CHAPTER 5. ALERTING SERVICE

5.1 Application

5.1.1 The ATS provider shall provide alerting service for:

a) every aircraft provided with air traffic control service by the ATS provider within its area of responsibility;

b) all other aircraft having filed a flight plan or otherwise known to the ATS provider, in so far as practicable; and

c) any aircraft known or believed to be the subject of unlawful interference.

5.1.2 The ATS provider shall assign the flight information centre or the area control centre as the central point for collecting all information relevant to a state of emergency of an aircraft operating within the ATS provider's area of responsibility and for forwarding such information to the rescue coordination centre.

5.1.3 The ATS provider shall maintain up-to-date contact details in the OPS Control Directory for the flight information centre or area control centre referred to in 5.1.2.

5.1.3.1 The contact details to be maintained in the OPS Control Directory shall be those of the appropriate ATS duty supervisor position or equivalent.

Note.— Guidance on the use of the OPS Control Directory is contained in the Manual on Global Aeronautical Distress and Safety System (GADSS) (ICAO Doc 10165).

5.1.4 Where an aircraft undergoes a state of emergency while it is under the control of the ATS provider's aerodrome control tower or approach control unit, the ATS provider shall ensure that the unit immediately notifies the ATS provider's flight information centre or area control centre responsible, which shall in turn notify the rescue coordination centre.

5.1.4.1 For the purpose of 5.1.5, the notification to the ATS provider's area control centre, flight information centre, or rescue coordination centre is not be required when the nature of the emergency is such that the notification would be superfluous.

5.1.4.2 When the urgency of the situation so requires, the ATS provider shall ensure that the responsible aerodrome control tower or approach control unit first alerts and takes all other necessary steps to activate the appropriate local rescue and emergency organizations which can give the immediate assistance required.

5.2 Notification of rescue coordination centres

5.2.1 Without prejudice to any other circumstances that may render such notification advisable, the ATS provider shall ensure that its ATS units, except as prescribed in 5.5.1, notify the rescue coordination centre immediately when it becomes aware of an aircraft in a state of emergency as follows:

a) Uncertainty phase when:

1) no communication has been received from an aircraft within a period of thirty minutes after the time a communication should have been received, or from the time an unsuccessful attempt to establish communication with such aircraft was first made, whichever is the earlier, or when

2) an aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by ATS units, whichever is the later,

except when no doubt exists as to the safety of the aircraft and its occupants.

b) Alert phase when:

1) 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, orwhen

2) an aircraft has been cleared to land and fails to land within five minutes of the estimated timeof landing and communication has not been re-established with the aircraft, or when

3) information has been received which indicates that the operating efficiency of the aircrafthas been impaired, but not to the extent that a forced landing is likely or where the likelihood of a forced landing has not been determined,

except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants, or when

4) an aircraft is known or believed to be the subject of unlawful interference.

c) Distress phase when:

1) following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraftis in distress, or when

2) the fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety, or when

3) 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 when

4) information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing,

except when there is reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.

5.2.2 The notification mentioned in 5.2.2 shall contain the following information, as available, in the order listed:

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) unit which made last contact, time and means used;

f) last position report and how determined;

g) colour and distinctive marks of aircraft;

h) dangerous goods carried as cargo;

i) any action taken by reporting office; and

j) other pertinent remarks.

5.2.3 [Reserved]

Note.— Information on the position of an aircraft in a distress condition may be accessible from the Location of an Aircraft in Distress Repository (LADR). Guidance on use of LADR is contained in the Manual on Global Aeronautical Distress and Safety System (GADSS) (Doc 10165). For more information see Annex 6, Part I, Appendix 9.

5.2.4 In addition to the notification in 5.2.1, the ATS provider shall ensure that the rescue coordination centre is furnished without delay with:

a) any useful additional information, especially on the development of the state of emergencythrough subsequent phases; or

b) information that the emergency situation no longer exists.

Note.— The cancellation of action initiated by the rescue coordination centre is the responsibility of that centre.

5.3 Use of communication facilities

The ATS provider shall ensure that its ATS units, as necessary, use all available communication facilities to endeavor to establish and maintain communication with an aircraft in a state of emergency, and to request news of the aircraft.

5.4 Plotting aircraft in a state of emergency

5.4.1 The ATS provider shall ensure that, when it considers a state of emergency is considered to exist, the flight of the aircraft involved is plotted on a chart in order to determine the probable future position of the aircraft and its maximum range of action from its last known position.

5.4.2 The ATS provider shall plot the flights of other aircraft known to be operating in the vicinity of the aircraft involved in order to determine their probable future positions and maximum endurance in order to decide which of those aircraft would be most suitable to render assistance.

5.5 Information to the operator

5.5.1 The ATS provider shall ensure that, when its area control or a flight information centre decides that an aircraft is in the uncertainty or the alert phase, it advises the operator, when practicable, prior to notifying the rescue coordination centre.

Note.— If an aircraft is in the distress phase, the rescue coordination centre has to be notified immediately in accordance with 5.2.1.

5.5.2 The ATS provider shall ensure that, whenever practicable, all information notified to the rescue coordination centre by an area control or flight information centre is also be communicated to the operator without delay.

5.6 Information to aircraft operating in the vicinity of an aircraft in a state of emergency

5.6.1 Except as provided in 5.6.2, the ATS provider shall ensure that, when its ATS unit has established that an aircraft is in a state of emergency, other aircraft known to be in the vicinity of the aircraft involved are informed of the nature of the emergency as soon as practicable.

5.6.2 The ATS provider shall ensure that, when its ATS unit knows or believes that an aircraft is being subjected to unlawful interference, no reference is made in ATS air-ground communications to the nature of the emergency unless:

a) the aircraft involved has already referred to the nature of the emergency in its communication with the ATS unit; and

b) the ATS unit is certain that such reference will not aggravate the situation.

CHAPTER 6. COMMUNICATIONS REQUIREMENTS FOR AIR TRAFFIC SERVICES

6.1 Aeronautical mobile service (air-ground communications)

6.1.1 General

6.1.1.1 The ATS provider shall ensure that radiotelephony and/or data link is used in air-ground communications for provision of air traffic services.

Note.— Requirements for ATS units to be provided with and to maintain guard on the emergency channel 121.5 MHz are specified in BCAR - 10, Volumes II and V.

6.1.1.2 The ATS provider shall ensure that its ATS units are provided with provided with communication equipment which will enable them to provide ATS in accordance with the RCP specification(s) specified in 2.8.

Note.— Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).

6.1.1.3 When direct pilot-controller two-way radiotelephony or data link communications are used for the provision of air traffic control service, the ATS provider shall provide recording facilities on all such air-ground communication channels.

Note.— Requirements for retention of all automatic recordings of communications in ATC are specified in BCAR - 10, Volume II, 3.5.1.5.

6.1.1.4 The ATS provider shall retain the recordings of communications channels required in paragraph 6.1.1.3 for a period of at least thirty days.

6.1.2 For flight information service

6.1.2.1 The ATS provider shall ensure that its air-ground communication facilities enable two-way communications between its flight information centre and appropriately equipped aircraft flying anywhere within the flight information region.

6.1.2.2 [Reserved]

6.1.3 For area control service

6.1.3.1 The ATS provider shall ensure that its air-ground communication facilities enable two-way communications between its area control centre and appropriately equipped aircraft flying anywhere within the control area(s).

6.1.3.2 [Reserved]

6.1.3.3 [Reserved]

6.1.4 For approach control service

6.1.4.1 The ATS provider shall ensure that its air-ground communication facilities enable direct, rapid, continuous and static-free two-way communications between its approach control unit and appropriately equipped aircraft under its control.

6.1.4.2 Where the unit providing approach control service functions as a separate unit, the ATS provider shall ensure that air-ground communications are conducted over communication channels provided for its exclusive use.

6.1.5 For aerodrome control service

6.1.5.1 The ATS provider shall ensure that its air-ground communication facilities enable direct, rapid, continuous and static-free two-way communications to take place between its aerodrome control tower and appropriately equipped aircraft operating at any distance within 45 km (25 NM) of the aerodrome concerned.

6.1.5.2 [Reserved]

6.2 Aeronautical fixed service (ground-ground communications)

6.2.1 General

6.2.1.1 The ATS provider shall use direct-speech and/or data link communications in ground-ground communications for provision of air traffic services.

Note 1.— Indication by time of the speed with which the communication should be established is provided as a guide to communication services, particularly to determine the types of communication channels required, e.g. that "instantaneous" is intended to refer to communications which effectively provide for immediate access between controllers; "fifteen seconds" to accept switchboard operation and "five minutes" to mean methods involving retransmission.

Note 2.— Requirements for retention of all automatic recordings of communications in ATC arespecified in BCAR-10, Volume II, 3.5.1.5.

6.2.2 Communications within a flight information region

6.2.2.1 *Communications between ATS units*

6.2.2.1.1 The ATS provider shall ensure that its flight information centre have facilities for communications with the following units providing a service within its area of responsibility:

a) the area control centre, unless collocated;

b) approach control units;

c) aerodrome control towers.

6.2.2.1.2 An area control centre, in addition to being connected to the flight information centre as prescribed in 6.2.2.1.1, shall have facilities for communications with the following units providing a service within its area of responsibility:

a) approach control units;

b) aerodrome control towers;

c) air traffic services reporting offices, when separately established.

6.2.2.1.3 An approach control unit, in addition to being connected to the flight information centre and the area control centre as prescribed in 6.2.2.1.1 and 6.2.2.1.2, shall have facilities for communications with the associated aerodrome control tower(s) and, when separately established, the associated air traffic services reporting office(s).

6.2.2.1.4 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 6.2.2.1.1, 6.2.2.1.2 and 6.2.2.1.3, shall have facilities for communications with the associated air traffic services reporting office, when separately established.

6.2.2.2 *Communications between ATS units and other units*

6.2.2.2.1 The ATS provider shall ensure that its flight information centre and/or area control centre have facilities for communications with the following units providing a service within their respective area of responsibility:

a) appropriate military units;

b) the meteorological office serving the centre;

c) the aeronautical telecommunications station serving the centre;

d) appropriate operator’s offices;

e) the rescue coordination centre or, in the absence of such centre, any other appropriate emergencyservice;

f) the international NOTAM office serving the centre.

6.2.2.2.2 The ATS provider shall ensure that its approach control units and aerodrome control towers have facilities for communications with the following units providing services within their respective area of responsibility:

a) appropriate military units;

b) rescue and emergency services (including ambulance, fire, etc.);

c) the meteorological office serving the unit concerned;

d) the aeronautical telecommunications station serving the unit concerned;

e) the unit providing apron management service, when separately established.

6.2.2.2.3 The communication facilities required under 6.2.2.2.1 a) and 6.2.2.2.2 a) shall include provisions for rapid and reliable communications between the ATS unit concerned and the military unit(s) responsible for control of interception operations within the area of responsibility of the ATS unit.

6.2.2.3 *Description of communication facilities*

6.2.2.3.1 The ATS provider shall ensure that the communication facilities required under 6.2.2.1, 6.2.2.2.1 a) and 6.2.2.2.2 a), b) and c) include provisions for:

a) communications by direct speech or in combination with data link to enable:

i) the communication to be established instantaneously for the purpose of transfer of control of aircraft using radar or ADS-B; and

ii) the communications to be established within fifteen seconds for any other purpose; and

b) printed communications, when a written record is required; the message transit time for such communications being no longer than five minutes.

6.2.2.3.2 [Reserved]

6.2.2.3.3 In all cases where automatic transfer of data to and/or from air traffic services computers is required, the ATS provider shall provide suitable facilities for automatic recording.

6.2.2.3.4 [Reserved]

6.2.2.3.5 The ATS provider shall ensure that the communication facilities required under 6.2.2.2.2 a), b) and c) include provisions for communications by direct speech arranged for conference communications.

6.2.2.3.6 [Reserved]

6.2.2.3.7 The ATS provider shall ensure that all facilities for direct-speech or data link communications between ATS units and other units described under 6.2.2.2.1 and 6.2.2.2.2 are provided with automatic recording.

6.2.2.3.8 The ATS provider shall ensure that all recordings of data and communications as required by 6.2.2.3.3 and 6.2.2.3.7 are retained for a period of at least thirty days.

6.2.3 Communications between flight information regions

6.2.3.1 The ATS provider shall ensure that its flight information centres and area control centres facilities for communications with all adjacent flight information centres and area control centres.

6.2.3.1.1 These communication facilities 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.

6.2.3.1.2 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 seconds.

6.2.3.1.3 When 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 6.2.3.1.2 shall include provisions for direct speech alone, or in combination with data link communications. The communication facilities shall be provided with automatic recording.

6.2.3.1.4 [Reserved]

6.2.3.2 The ATS provider shall ensure that adjacent ATS units are be connected in all cases where special circumstances exist.

Note.— Special circumstances may be due to traffic density, types of aircraft operations and/or the manner in which the airspace is organized and may exist even if the control areas and/or control zones are not contiguous or have not (yet) been established.

6.2.3.3 Wherever local conditions necessitate the clearance of aircraft into an adjacent control area prior to departure, the ATS provider shall ensure that its approach control unit and/or aerodrome control tower are connected to the area control centre serving the adjacent area.

6.2.3.4 The ATS provider shall ensure that the communication facilities in 6.2.3.2 and 6.2.3.3 include provisions for communications by direct speech alone, or in combination with data link to enable:

a) the communication to be established instantaneously for the purpose of transfer of control of aircraft using radar, ADS-B or ADS-C; and

b) the communications to be established within fifteen seconds for any other purpose.

6.2.3.5 The ATS provider shall provide suitable facilities for automatic recording in all cases where automatic exchange of data between air traffic services computers is required

6.2.3.6 The ATS provider shall ensure that all recordings of data and communications as required in 6.2.3.5 are retained for a period of at least thirty days.

6.2.4 Procedures for direct-speech communications

[Reserved]

6.3 Surface movement control service

6.3.1 Communications for the control of vehicles other than aircraft on maneuvering areas atcontrolled aerodromes

6.3.1.1 The ATS provider shall provide its aerodrome control tower with two-way radiotelephony communication facilities for the control of vehicles on the maneuvering area, except where communication by a system of visual signals is deemed to be adequate.

6.3.1.2 Where conditions warrant, the ATS provider shall provide:

a) separate communication channels for the control of vehicles on the maneuvering area; and

b) automatic recording facilities on all such channels.

6.3.1.3 The ATS provider shall ensure that recordings of communications required in 6.3.1.2 are retained for a period of at least thirty days.

Note.— See also BCAR-10, Volume II, 3.5.1.5.

6.4 Aeronautical radio navigation service

6.4.1 Automatic recording of surveillance data

6.4.1.1 The ATS provider shall ensure that surveillance data from primary and secondary radar equipment or other systems (e.g. ADS-B, ADS -C), used as an aid to air traffic services, are automatically recorded for use in accident and incident investigations, search and rescue, air traffic control and surveillance systems evaluation and training.

6.4.1.2 The ATS provider shall ensure that:

a) automatic recordings required in 6.4.1.1 are retained for a period of at least thirty days;

b) when the recordings are pertinent to accident and incident investigations, they are retained for longer periods until it is evident that they will no longer be required.

CHAPTER 7. INFORMATION REQUIREMENTS FOR AIR TRAFFIC SERVICES

7.1 Meteorological information

7.1.1 General

7.1.1.1 The ATS provider shall establish arrangements with the meteorological service provider for its ATS units to be supplied with up-to-date information on existing and forecast meteorological conditions as necessary for the performance of their respective functions.

7.1.1.1.1 The information to be provided in 7.1.1.1 shall be given:

a) in a form that requires minimum interpretation y the air traffic services personnel; and

b) at a frequency which satisfies the requirements of the ATS units concerned for the provision of air traffic service.

7.1.1.2 [Reserved]

7.1.1.3 [Reserved]

7.1.2 Flight information centres and/or area control centres

7.1.2.1 The ATS provider shall establish arrangements with the meteorological service provider for its flight information centres and/or area control centres to be supplied with meteorological information as described in paragraph 9.1.3 of PANS-MET (ICAO Doc 10157) with emphasis on the occurrence or expected occurrence of weather deterioration as soon as this can be determined.

7.1.2.1.1 The ATS provider shall ensure that the information in 7.1.2.1 covers the flight information region or control area and such other areas as may be determined on the basis of regional air navigation agreements.

Note.— For the purpose of this provision, certain changes in meteorological conditions are construed as deterioration in a weather element, although they are not ordinarily considered as such. An increase in temperature may, for example, adversely affect the operation of certain types of aircraft.

7.1.2.2 The arrangements established in accordance with 7.1.2.1 shall ensure that the ATS provider's flight information centre and/or area control centre are provided, at suitable intervals, with current pressure data for setting altimeters, for locations specified by the flight information centre or area control centre concerned.

7.1.3 Units providing approach control service

7.1.3.1 The ATS provider shall establish arrangements with the meteorological service provider for its approach control units to be provided with:

a) meteorological information as described in paragraph 9.1.2 of the PANS-MET (ICAO Doc 10157) for the airspace and the aerodromes with which they are concerned;

b) special reports and amendments to forecasts as necessary in accordance with established criteria specified in the arrangements, without waiting for the next routine report or forecast; and

c) where multiple anemometers are used, clearly marked indicators to identify the runway and section of the runway monitored by each anemometer.

7.1.3.2 The arrangements established in accordance with 7.1.3.1 shall ensure that the ATS provider's approach control unit is provided with current pressure data for setting altimeters, for locations specified by the approach control unit.

7.1.3.3 The ATS provider shall equip its approach control unit providing service for final approach, landing and take-off with surface wind display.

7.1.3.3.1 The display mentioned in 7.1.3.3 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 such a station exists.

7.1.3.4 The ATS provider shall equip its unit providing approach control service for final approach, landing and takeoff at aerodromes where runway visual range values are assessed by instrumental means with display permitting read -out of the current runway visual range value.

7.1.3.4.1 The display mentioned in 7.1.3.4 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 such a station exists.

7.1.3.5 [Reserved]

7.1.3.6 The arrangements established in accordance with 7.1.3.1 shall ensure that the ATS provider's approach control unit is provided with information on wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach.

Note.— Provisions concerning the issuance of wind shear warnings and alerts and ATS requirements for meteorological information are given in BCAR-3, Chapter 7 and in the PANS-MET (ICAO Doc 10157), Chapters 6 and 9.

7.1.4 Aerodrome control towers

7.1.4.1 The ATS provider shall establish arrangements with the meteorological service provider for its aerodrome control towers to be supplied with meteorological information as described in paragraph 9.1.1 of the PANS-MET (ICAO Doc 10157) for the aerodrome with which they are concerned.

7.1.4.1.1 Special reports and amendments to forecasts shall be communicated to the aerodrome control towers as soon as they are considered necessary in accordance with criteria established in the arrangements specified in 7.1.4.1, without waiting for the next routine report or forecast.

7.1.4.2 The arrangements established in accordance with 7.1.4.1 shall ensure that the ATS provider's aerodrome control towers are provided with current pressure data for setting altimeters for the aerodrome concerned.

7.1.4.3 The ATS provider shall equip its aerodrome control towers with surface wind display.

7.1.4.3.1 The display mentioned in 7.1.4.3 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.

7.1.4.3.2 Where multiple sensors are used, the displays to which they are related shall be clearly marked to identify the runway and section of the runway monitored by each sensor.

7.1.4.4 The ATS provider shall equip its aerodrome control towers at aerodromes where runway visual range values are measured by instrumental means with display(s) permitting read-out of the current runway visual range value.

7.1.4.4.1 The display mentioned in 7.1.4.4 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.

7.1.4.5 [Reserved]

7.1.4.6 The arrangements established in accordance with 7.1.4.1 shall ensure that the ATS provider's aerodrome control towers are provided with information on wind shear which could 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.

7.1.4.7 [Reserved]

7.1.5 Communication stations

The arrangements established in accordance with 7.1.2.1 shall ensure that the ATS provider's flight information centre or the area control centre is provided copies of current meteorological reports and forecasts supplied by the meteorological service provider to communication stations.

7.2 Information on aerodrome conditions and the operational status of associated facilities

The ATS provider shall ensure that its aerodrome control towers and approach control units are 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 aerodromes with which they are concerned.

7.3 Information on the operational status of navigation services

7.3.1 The ATS provider shall keep its ATS units currently informed of the operational status of radio navigation services and visual aids essential for take-off, departure, approach and landing

procedures within their area of responsibility and those radio navigation services and visual aids essential for surface movement.

7.3.2 [Reserved]

Note.— Guidance material regarding the provision of information to ATS units in respect to visual and non-visual navigation aids is contained in the Air Traffic Services Planning Manual (ICAO Doc 9426). Specifications for monitoring visual aids are contained in Bhutan Aerodrome Standards, and related guidance material is in the Aerodrome Design Manual (ICAO Doc 9157), Part 5. Specifications for monitoring non-visual aids are contained in BCAR - 10, Volume I.

7.4 Information on unmanned free balloons

The ATS provider shall arrange for information concerning unmanned free balloons to be disseminated to its ATS units upon receipt of such information in accordance with the provisions contained in BCAR-2.

7.5 Information concerning volcanic activity

7.5.1 The ATS provider shall inform its ATS units of pre-eruption volcanic activity,volcanic eruptions and volcanic ash cloud which could affect airspace used by flights within its area of responsibility.

7.5.2 The ATS provider shall provide its area control centre and flight information centre with volcanic ash advisory information issued by the associated Volcanic Ash Advisory Centre that is responsible for providing volcanic ash advisories to the ATS provider.

Note.— VAACs are designated by regional air navigation agreements in accordance with BCAR-3, 3.5.1.

7.6 Information concerning radioactive materials and toxic chemical “clouds”

The provider shall inform its ATS units of the release into the atmosphere of radioactive materials or toxic chemicals which could affect airspace used by flights within their area ofresponsibility.

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APPENDIX-1. PRINCIPLES GOVERNING THE IDENTIFICATION OF NAVIGATION SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES

(Chapter 2, 2.7 and 2.13 refer)

Note.— See Appendix 3 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 *(ICAO Doc 9426).*

1. Designators for ATS routes and navigation specifications

1.1 The purpose of a system of route designators and navigation specification(s) applicable to specified ATS route segment(s), route(s) or area is to allow both pilots and ATS, taking into account automation requirements:

a) to make unambiguous reference to any ATS route without the need to resort to the use ofgeographical coordinates 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, when operating along an ATSroute 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 concerning the publication of navigation specifications are given in BCAR-4, Chapter 7, and PANS-AIM (ICAO Doc 10066), Appendix 2.

Note 2.— In relation to this appendix and for flight planning purposes, a prescribed navigation specification is not considered an integral part of the ATS route designator.

1.2 In order to meet this purpose, 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 needfor fundamental changes.

1.3 Controlled, advisory and uncontrolled ATS routes, with the exception of standard arrival and departure routes, shall therefore be identified as specified hereafter.

2. Composition of designator

Controlled, advisory and uncontrolled ATS routes, with the exception of standard arrival and departure routes, shall therefore be identified as specified hereafter.

2.1 The ATS route designator shall consist of a basic designator supplemented, if necessary, by:

a) one prefix as prescribed in 2.3; and

b) one additional letter as prescribed in 2.4.

2.1.1 The number of characters required to compose the designator shall not exceed six characters.

2.1.2 The number of characters required to compose the designator should, whenever possible, be kept to a maximum of five characters.

2.2 The basic designator shall consist of one letter of the alphabet followed by a number from 1 to 999.

2.2.1 Selection of the letter shall be made from those listed hereunder:

a) A, B, G, R for routes which form part of the regional networks of ATS routes and are not areanavigation routes;

b) L, M, N, P for area navigation routes which form part of the regional networks of ATS routes;

c) H, J, V, W for routes which do not form part of the regional networks of ATS routes and are notarea navigation routes;

d) Q, T, Y, Z for area navigation routes which do not form part of the regional networks of ATSroutes.

2.3 Where applicable, one supplementary letter shall be added as a prefix to the basic designator in accordance with the following:

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;

c) S to indicate a route established exclusively for use by supersonic aircraft during acceleration, deceleration and while in supersonic flight.

2.4 When prescribed by the ATS provider or on the basis of regional air navigation agreements, a supplementary letter may be added after the basic designator of the ATS route in questionin order to indicate the type of service provided in accordance with the following:

a) the letter F to indicate that on the route or portion thereof advisory service only is provided;

b) the letter G to indicate that on the route or portion thereof flight information service only isprovided.

Note 1.— Due to limitations in the display equipment on board 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 controlled route, advisory route or flight information route is indicated in aeronautical charts and aeronautical information publications in accordance with the provisions in BCAR-4 and BCAR-15.

3. Assignment of basic designators

3.1 Basic ATS route designators shall be assigned in accordance with the following principles.

3.1.1 The same basic designator shall be assigned to a main trunk route throughout its entire length, irrespective of terminal control areas, States or regions traversed.

3.1.2 Where two or more trunk routes have a common segment, the segment in question shall be assigned each of the designators of the routes concerned, except where this would present difficulties in the provision of air traffic service, in which case, by common agreement, one designator only shall be assigned.

3.1.3 A basic designator assigned to one route shall not be assigned to any other route.

3.1.4 Bhutan's requirements for designators shall be notified to the Regional Offices of ICAO for coordination.

4. Use of designators in communications

4.1 In printed communications, the designator shall be expressed at all times by not less than two and not more than six characters.

4.2 In voice communications, the basic letter of a designator shall be spoken in accordance with the ICAO spelling alphabet.

4.3 Where the prefixes K, U or S specified in 2.3 are used, they shall, in voice communications, be spoken as follows:

K — KOPTER

U — UPPER

S — SUPERSONIC

The word "kopter" shall be pronounced as in the word "helicopter" and the words "upper" and "supersonic" as in the English language.

4.4 Where the letters "F" or "G" specified in 2.4 are used, the flight crew should not be required to use them in voice communications.

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APPENDIX-2. PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

(Chapter 2, 2.15 refers)

1. Establishment of significant points

1.1 Significant points should, whenever possible, be established with reference to ground-based or space-based radio navigation aids, preferably VHF or higher frequency aids.

1.2 Where such ground-based or space-based radio navigation aids do not exist, significant points shall be established at locations which 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. Specific points may be designated as ‘‘transfer of control’’ points by agreement between adjacent air traffic control units or control positions concerned.

2. Designators for significant points marked by the site of a radio navigation aid

2.1 Plain language name for significant points marked by the site of a radio navigation aid

2.1.1 Whenever practicable, significant points shall be named with reference to an identifiable and preferably prominent geographical location.

2.1.2 In selecting a name for the significant point, 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 speakingin the language used in ATS communications. 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;

Example: FUERSTENFELDBRUCK = FURSTY

b) the name shall be easily recognizable in voice communications and shall be free of ambiguity with those of other significant points in the same general area. In addition, the name shall not create confusion with respect to other communications exchanged between air traffic services and pilots;

c) the name should, if possible, consist of at least six letters and form two syllables and preferably not more than three;

d) the selected name shall be the same for both the significant point and the radio navigation aidmarking it.

2.2 Composition of coded designators for significant points marked by the site ofa radio navigation aid

2.2.1 The coded designator shall be the same as the radio identification of the radio navigation aid. It shall be so composed, if possible, as to facilitate association with the name of the point in plain language.

2.2.2 Coded designators shall not be duplicated within 1100 km (600 NM) of the location of the radio navigation aid concerned, except as noted hereunder.

Note.— When two radio navigation aids operating in different bands of the frequency spectrum aresituated at the same location, their radio identifications are normally the same.

2.3 Bhutan's requirements for coded designators shall be notified to the Regional Offices of ICAO for coordination.

3. 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 purposes, it shall be designated by a unique five-letter pronounceable “name-code”.This name-code designator then serves as the name as well as the coded designator of the significant point.

Note.— The principles governing the use of alphanumeric name-codes in support of RNAV SIDs, STARsand instrument approach procedures are detailed in the PANS-OPS (ICAO Doc 8168).

3.2 The name-code designator 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.

Examples: ADOLA, KODAP

3.3 The name-code designator shall be easily recognizable in voice communications and shall be free of ambiguity with those used for other significant points in the same general area.

3.4 The unique five-letter pronounceable name-code designator assigned to a significant point shall not be assigned to any other significant point. When there is a need to relocate a significant point, a new name-code designator shall be chosen. In cases when Bhutan the allocation of specific name-codes is desired to be kept for reuse at a different location, such name-codes shall not be used until after a period of at least six months.

3.5 Bhutan's requirements for unique five-letter pronounceable name-code designators shall be notified to the Regional Offices of ICAO for coordination.

3.6 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 World Geodetic System—1984 (WGS-84) geographical coordinates, except that permanently established significant points serving as exit and/or entry points into such areas shall be designated

in accordance with the applicable provisions in 2 or 3.

4. Use of designators in communications

4.1 Normally the name selected in accordance with 2 or 3 shall be used to refer to the significant point in voice communications. If the plain language name for a significant point marked by the site of a radionavigation aid selected in accordance with 2.1 is not used, it shall be replaced by the coded designator which, in voice communications, shall be spoken in accordance with the ICAO spelling alphabet.

4.2 In printed and coded communications, only the coded designator or the selected name-code shall be used to refer to a significant point.

5. 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.

5.2 In establishing such points, consideration shall be given to the following factors:

a) the type of air traffic services 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(s) employed;

h) the start or end of significant phases of a flight (climb, descent, change of direction, etc.);

i) transfer of control procedures;

j) safety and search and rescue aspects;

k) the cockpit and air-ground communication workload.

5.3 Reporting points shall be established either as “compulsory” or as “on-request”.

5.4 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 should not necessarily determine its designation as a compulsory reporting point;

c) compulsory reporting points should not necessarily be established at flight information region or control area boundaries.

5.5 "On-request" reporting points may be established in relation to the requirements of air traffic services for additional position reports when traffic conditions so demand.

5.6 The designation of compulsory and on-request reporting points shall be reviewed regularly with a view to keeping the requirements for routine position reporting to the minimum necessary to ensure efficient air traffic services.

5.7 Routine reporting over compulsory reporting points should not systematically be made mandatory for all flights in all circumstances. In applying this principle, particular attention shall be given to the following:

a) high-speed, high-flying aircraft should not be required to make routine position reports over all reporting points established as compulsory for low-speed, low-flying aircraft;

b) aircraft transiting through a terminal control area should not be required to make routine positionreports as frequently as arriving and departing aircraft.

5.8 In areas where the above principles regarding the establishment of reporting points would not be practicable, a reporting system with reference to meridians of longitude or parallels of latitude expressedin whole degrees may be established.

APPENDIX-3. PRINCIPLES GOVERNING THE IDENTIFICATION OF STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES

(Chapter 2, 2.13 refers)

Note.— Material relating to the establishment of standard departure and arrival routes and associated procedures is contained in the Air Traffic Services Planning Manual (ICAO Doc 9426).

1. Designators for standard departure and arrival routes and associated procedures

Note.— In the following text, the term "route" is used in the meaning of "route and associatedprocedures".

1.1 The system of designators shall:

a) permit the identification of each route in a simple and unambiguous manner;

b) make a clear distinction between:

— departure routes and arrival routes;

— departure or arrival routes and other ATS routes;

— 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;

f) provide sufficient possibility for extension to cater for any future requirements without the needfor fundamental changes.

1.2 Each route shall be identified by a plain language designator and a corresponding codeddesignator.

1.3 The designators shall, in voice communications, be easily recognizable as relating to a standard departure or arrival route and shall not create any difficulties in pronunciation for pilots and ATS personnel.

2. Composition of designators

2.1 Plain language designator

2.1.1 The plain language designator of a standard departure or arrival route shall consist of:

a) a basic indicator; followed by

b) a validity indicator; followed by

c) a route indicator, where required; followed by

d) the word "departure" or "arrival"; followed by

e) the word "visual", if the route has been established for use by aircraft operating in accordance with the visual flight rules (VFR).

2.1.2 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.

2.1.3 The validity indicator shall be a number from 1 to 9.

2.1.4 The route indicator shall be one letter of the alphabet. The letters "I" and "O" shall not be used.

2.2 Coded designator

The coded designator of a standard departure or arrival route, instrument or visual, shall consist of:

a) the coded designator or name-code of the significant point described in 2.1.1 a); followed by

b) the validity indicator in 2.1.1 b); followed by

c) the route indicator in 2.1.1 c), where required.

Note.— Limitations in the display equipment on board aircraft may require shortening of the basic indicator, if that indicator is a five-letter name-code, e.g. KODAP. The manner in which such an indicator is shortened is left to the discretion of operators.

3. Assignment of designators

3.1 Each route shall be assigned a separate designator.

3.2 To distinguish between two or more routes which relate to the same significant point (and therefore are assigned the same basic indicator), a separate route indicator as described in 2.1.4 shall be assigned to each route.

4. Assignment of validity indicators

4.1 A validity indicator shall be assigned to each route to identify the route which is currently in effect.

4.2 The first validity indicator to be assigned shall be the number "1".

4.3 Whenever a route is amended, a new validity indicator, consisting of the next higher number, shall be assigned. The number "9" shall be followed by the number "1".

5. Examples of plain language and coded designators

5.1 *Example 1*: Standard departure route — instrument:

a) Plain language designator: BRECON ONE DEPARTURE

b) Coded designator: BCN 1

5.1.1 *Meaning*: The designator identifies a standard instrument departure route which terminates at the significant point BRECON (basic indicator). BRECON is a radio navigation facility with the identification BCN (basic indicator of the coded designator). The validity indicator ONE (1 in the codeddesignator) signifies either that the original version of the route is still in effect or that a change has beenmade from the previous version NINE (9) to the now effective version ONE (1) (see 4.3). The absenceof a route indicator (see 2.1.4 and 3.2) signifies that only one route, in this case a departure route, has been established with reference to BRECON.

5.2 *Example 2*: Standard arrival route — instrument:

a) Plain language designator: KODAP TWO ALPHA ARRIVAL

b) Coded designator: KODAP 2 A

5.2.1 *Meaning*: This designator identifies a standard instrument arrival route which begins at the significant point KODAP (basic indicator). KODAP 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 Appendix 2. 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 severalroutes established with reference to KODAP and is a specific character assigned to this route.

5.3 *Example 3*: Standard departure route — visual:

a) Plain language designator: ADOLA FIVE BRAVO DEPARTURE VISUAL

b) Coded designator: ADOLA 5 B

5.3.1 *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.

6. Composition of designators for MLS/RNAV approach procedures

6.1 Plain language designator

6.1.1 The plain language designator of an MLS/RNAV approach procedure shall consist of:

a) “MLS”; followed by

b) a basic indicator; followed by

c) a validity indicator; followed by

d) a route indicator; followed by

e) the word “approach”; followed by

f) the designator of the runway for which the procedure is designed.

6.1.2 The basic indicator shall be the name or name-code of the significant point where the approach procedure begins.

6.1.3 The validity indicator shall be a number from 1 to 9.

6.1.4 The route indicator shall be one letter of the alphabet. The letters “I” and “O” shall not be used.

6.1.5 The designator of the runway shall be in accordance with Bhutan Aerodrome Standards, 5.2.2.

6.2 Coded designator

6.2.1 The coded designator of an MLS/RNAV approach procedure shall consist of:

a) “MLS”; followed by

b) the coded designator or name-code of the significant point described in 6.1.1 b); followed by

c) the validity indicator in 6.1.1 c); followed by

d) the route indicator in 6.1.1 d); followed by

e) the runway designator in 6.1.1 f).

6.3 Assignment of designators

6.3.1 The assignment of designators for MLS/RNAV approach procedures shall be in accordance with paragraph 3. Procedures having identical tracks but different flight profiles shall be assigned separate route indicators.

6.3.2 The route indicator letter for MLS/RNAV approach procedures shall be assigned uniquely to all approaches at an airport until all the letters have been used. Only then shall the route indicator letter be repeated. The use of the same route indicator for two routes using the same MLS ground facility shall not be permitted.

6.3.3 The assignment of validity indicator for approach procedures shall be in accordance with paragraph 4.

6.4 Example of plain language and coded designators

6.4.1 *Example:*

a) Plain language designator: MLS HAPPY ONE ALPHA APPROACH RUNWAY ONE EIGHT LEFT

b) Coded designator: MLS HAPPY 1 A 18L

6.4.2 *Meaning:* The designator identifies an MLS/RNAV approach procedure which begins at the significant point HAPPY (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 Appendix 2. 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.

7. Use of designators in communications

7.1 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 2.1.1 d) and 2.1.1 e) are considered to be an integral element of the plain language designator.

7.2 In printed or coded communications, only the coded designator shall be used.

8. Display of routes and procedures to air traffic control

8.1 A detailed description of each currently effective standard departure and/or arrival route/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, orare otherwise of relevance in the provision of air traffic control services.

8.2 Whenever possible, a graphic portrayal of the routes/procedures shall also be displayed.

APPENDIX-4. ATS AIRSPACE CLASSES — SERVICES PROVIDED AND FLIGHT REQUIREMENTS

(Chapter 2, 2.6 refers)

Class	*Type of flight*	*Separation provided*	*Service provided*	*Speed limitation**	*Radio communication requirement*	*Subject to an ATC clearance*
A	IFR only	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
B	IFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
C	IFR	IFR from IFR IFR from VFR	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	VFR from IFR	1) Air traffic control service for separation from IFR; 2) VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
D	IFR	IFR from IFR	Air traffic control service, traffic information about VFR flights (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	IFR/VFR and VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
E	IFR	IFR from IFR	Air traffic control service and, as far as practical, traffic information about VFR flights	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	Traffic information as far as practical	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
F	IFR	IFR from IFR as far as practical	Air traffic advisory service; flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
G	IFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No

* When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000 ft.

APPENDIX-5. SCHEDULING LIMITS FOR FATIGUE MANAGEMENT

The ATS provider shall ensure that the roster mentioned in paragraph 2.28.2(a) for normal operations is planned in accordance with the following scheduling limits:

(a) Duty Period Parameters

- The aggregate of duty period hours shall not exceed 200 hours within a defined period of 720 consecutive hours or 30 consecutive days;
- There shall be at least 12 hours of rest period between the end of one duty period and the beginning of the next;
- The number of consecutive work days of each air traffic controller must not exceed 6;
- If the maximum number of consecutive days of duty is rostered, there shall be a minimum interval of 60 hours between the end of one consecutive period of duty days and the next.

(b) Maximum Duty Period

- The number of hours of a duty period of each air traffic controller must not exceed 12 hours

(c) Operational Duty

- Each time-in-position at any time during a duty period must not exceed 3.5 hours, except during periods of low traffic when the time-in-position may be up to 7 hours;
- No operational duty shall exceed 3.5 hours without there being a break taken during or at the end of that period;
- The minimum duration of each break between each period of time-in-position in any duty period is 30 minutes.

(d) Night Duty

- Night time should be considered as the time between midnight and 05:59 local.
- A duty which covers all or part of the period of night duty shall not exceed 10 hours;
- No more than 3 consecutive duties shall be worked which cover all or part of the period of night duty;
- A minimum period of 54 hours shall occur between the end of duties which cover all or part of the period of night duty and the commencement of the next period of duty.

(e) Recall Duty

- No more than 3 on-call duties shall be worked in a 7-day period.

- The maximum length of on-call period of duty where the ATCO does not attend the place of work shall be 20 hours.

(f) Duty Rosters

- Duty rosters should be prepared and published not later than the 25th of the current month to provide ATCOs the opportunity to plan adequate rest.

- Consideration should be given to the cumulative effects of undertaking long duty hours interspersed with minimum non-work periods, and of avoiding rosters that result in the serious disruption of an established pattern of working and sleeping. Rosters should cover a period of one (1) month. Copies of the duty roster shall be forwarded to Air Navigation Services (ANS) Section of BCAA before the 7th day of following month.

(g) Records

- To provide evidence of compliance with prescriptive limits, records will be kept for six (6) months of the duties performed and non-duty periods achieved so as to facilitate inspection by the service's authorised personnel and audit by the Authority.

(h) Duty Period Commencement and Completion

- No duty will be rostered or commenced before 0500 local time or beginning of morning civil twilight, whichever is earlier;

- No duty will be rostered to end after midnight local time (12:00 AM on following day);

- References to "Local time" in this section means the time at the location at which the duty commenced.

(i) Duty Extension

- Once the duty has commenced, an extension is permitted by up to two (2) hours if:

  — an extension has been approved by Head of ATM; and

  — the extended duty will not end later than midnight (12:00 AM)

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APPENDIX-6. FATIGUE RISK MANAGEMENT SYSTEM REQUIREMENTS

[Reserved]

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APPENDIX-7. RESPONSIBILITIES CONCERNING AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE

(Chapter 2, 2.34 refers)

1. The instrument flight procedure design services shall be provided by:

   a) an instrument flight procedure design service provider designated by BCAA; and/or

   b) an instrument flight procedure design service provider of another State with whom Bhutan hasagreed with to provide a joint service; and/or

   c) any external agency(ies) acceptable to BCAA.

2. In all cases in paragraph 1 above, all instrument flight procedures for Bhutanese aerodromes and airspace shall have to be approved by BCAA.

3. Instrument flight procedures shall be designed in accordance with the design criteria described in ICAO Doc 8168 (Volume I).

4. An instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace under the authority shall meet the requirements established by BCAA.

5. An instrument flight procedure design service provider shall utilize a quality management system at each stage of the instrument flight procedure design process.

   Note.— This requirement can be met by means of a quality assurance methodology, such as that described in PANS-OPS (ICAO Doc 8168), Volume II. Guidance for implementing such a methodology is contained in the Quality Assurance Manual for Flight Procedure Design *(ICAO Doc 9906).*

6. The instrument flight procedures for Bhutanese aerodromes and airspace shall be maintained and periodically reviewed. The interval for periodic review of instrument flight procedures shall not exceed five years.

   Note.— Guidance on maintenance and periodic review is contained in the Quality Assurance Manual for Flight Procedure Design *(ICAO Doc 9906).*

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