Maldives Civil Aviation Authority
Republic of Maldives

Maldivian Civil Aviation Regulations

MCAR-11 Air Traffic Services

Issue 2, Amendment 0, 16 November 2015

Foreword

Maldives Civil Aviation Authority, in exercise of the powers conferred on it under Articles 5 and 6 of the Maldives Civil Aviation Act 2/2012 has adopted this Regulation.

This Regulation shall be cited as MCAR-11 Air Traffic Services and shall come in to force on 16 November 2015.

Existing aviation requirements in the field of air navigation as listed in MCAR-11 Air Traffic Services dated 30 July 2009 will be repealed as from 16 November 2015.

Definitions of the terms and abbreviations used in this regulation, unless the context requires otherwise, are in MCAR-1 Definitions and Abbreviations.

For the Civil Aviation Authority
Hussain Jaleel
Chief Executive

List of Amendments

Rev #	Date	Remarks
Issue 1 Amendment 0	2009-07-30	Initial issue
Issue 2 Amendment 0	2015-11-16	Incorporated ICAO Annex 11, Thirteenth Edition, Amendment 49, 14 November 2013

List of Effective Pages

Section	Page	Amendment	Date
Foreword	ii	Issue: 2, Amendment: 0	16 November 2015
List of Amendments	iii	Issue: 2, Amendment: 0	16 November 2015
List of Effective Pages	iv	Issue: 2, Amendment: 0	16 November 2015
Table of Contents	v-vii	Issue: 2, Amendment: 0	16 November 2015
Chapter 1	1-1 – 1-1	Issue: 2, Amendment: 0	16 November 2015
Chapter 2	2-1 – 2-18	Issue: 2, Amendment: 0	16 November 2015
Chapter 3	3-1 – 3-10	Issue: 2, Amendment: 0	16 November 2015
Chapter 4	4-1 – 4-10	Issue: 2, Amendment: 0	16 November 2015
Chapter 5	5-1 – 5-3	Issue: 2, Amendment: 0	16 November 2015
Chapter 6	6-1 – 6-6	Issue: 2, Amendment: 0	16 November 2015
Chapter 7	7-1 – 7-4	Issue: 2, Amendment: 0	16 November 2015
Appendix 1	APP 1-1 – APP 1-3	Issue: 2, Amendment: 0	16 November 2015
Appendix 2	APP 2-1 – APP 2-4	Issue: 2, Amendment: 0	16 November 2015
Appendix 3	APP 3-1 – APP 3-5	Issue: 2, Amendment: 0	16 November 2015
Appendix 4	APP 4-1 – APP 4-1	Issue: 2, Amendment: 0	16 November 2015
Appendix 5	APP 5-1 – APP 5-2	Issue: 2, Amendment: 0	16 November 2015
Attachment A	ATT A-1 – ATT A-10	Issue: 2, Amendment: 0	16 November 2015
Attachment B	ATT B-1 – ATT B-4	Issue: 2, Amendment: 0	16 November 2015
Attachment C	ATT C-1 – ATT C-4	Issue: 2, Amendment: 0	16 November 2015

Table of Contents

CHAPTER 1 – Definitions

Definitions of the terms and abbreviations used in this regulation, unless the context requires otherwise, are in MCAR-1 Definitions and Abbreviations.

CHAPTER 2 – General

2.1 The Authority to Provide Air Traffic Services

2.1.1 The authority responsible shall provide, Air Traffic Services, in the defined airspace and at aerodromes within the territorial limits of Maldives in accordance with the conditions, standards and recommended practices contained in this regulation and any subsequent amendments/changes thereto including any other requirements that may be specified by the CAA.

2.1.2 Maldives Airports Company Ltd is the designated responsible authority for arrangement and provision of Air Traffic Services in Maldives. No other agency shall provide an air traffic service unless approved by the CAA.

2.1.3 The information regarding Air Traffic Services available in the airspace and at aerodromes shall be published in AIP Maldives.

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 The need for the provision of air traffic services shall be determined by 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 carriage of airborne collision avoidance systems (ACAS) by aircraft in a given area shall not be a factor in determining the need for air traffic services in that area.

2.5 Designation of Aerodromes and Airspace:

2.5.1 The airspace or the portions of the airspace and aerodromes shall be designated by the CAA in relation to the air traffic services that are to be provided.

2.5.2 The designation of particular portions of airspace or the particular aerodromes shall be as follows

2.5.2.1 FLIGHT INFORMATION REGIONS

2.5.2.1.1 Those portions of 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

2.5.2.3.1 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 ATS airspaces shall be 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 are separated 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.

Note – 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. (See also PANS-ATM, Chapter 9.)

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

2.6.2 Those airspace classes shall be selected appropriate to their needs.

2.6.3 The requirements for flights within each class of airspace shall be as shown in the table in Appendix 4.

Note – Where the ATS airspaces adjoin vertically, i.e. one above the other, flights at a common level would comply with requirements of, and be given services applicable to, the less restrictive class of airspace. In applying these criteria, Class B airspace is therefore considered less restrictive than Class A airspace; Class C airspace less restrictive than Class B airspace, etc.

2.7 Performance – Based Navigation (PBN) Operation.

2.7.1 Performance – based navigation, wherever applicable shall be applied in accordance with the navigation specifications available in the relevant regulations / Standards. When applicable and on the basis of regional air navigation agreements, the navigation

specification(s) for designated areas, tracks or ATS routes shall be published in AIP Maldives.

2.7.2 Performance – based navigation shall be implemented as per the PBN implementation Plan.

2.7.3 The prescribed navigation specification shall be appropriate to the level of communications, navigation and air traffic services provided in the airspace concerned.

2.8 Required Communication Performance (RCP)

2.8.1 RCP types shall be specified on the basis of regional air navigation agreements.

2.8.2 The prescribed RCP types shall be appropriate to the air traffic services provided in the airspace concerned

2.9 Establishment and Designation of the Units Providing Air Traffic Services

2.9.1 The air traffic services shall be provided by units established and designated as follows:

2.9.1.1 Flight information service and alerting service within Maldives shall be provided by the concerned Air Traffic Control units within their designated areas of responsibility.

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

2.9.2 Air traffic control units i.e. Area Control Centers, Approach Control units and aerodrome Control Towers shall be established to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

Note – The services to be provided by various air traffic control units are indicated in 3.2

2.10 Specifications for Flight Information Regions, Control Areas and Control Zones:

2.10.1 The delineation of airspace, wherein air traffic services are to be provided, should be related to the nature of the route structure and the need for efficient service rather than to national boundaries.

2.10.2 FLIGHT INFORMATION REGIONS

2.10.2.1 Flight information regions shall be delineated to cover the whole of the air route structure to be served by such regions.

2.10.2.2 A flight information region shall include all airspace within its lateral limits, except as limited by an upper flight information region.

2.10.2.3 Where a flight information region is limited by an upper flight information region, the lower limit specified for the upper flight information region shall constitute the upper vertical limit of the flight information region and shall coincide with a VFR cruising level.

Note – In cases where an upper flight information region is established the procedures applicable therein need not be identical with those applicable in the underlying flight information region.

2.10.3 CONTROL AREAS

2.10.3.1 Control areas including, *inter alia,* airways and terminal control areas shall be delineated 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.

Note – In a control area other than one formed by a system of airways, a system of routes may be established to facilitate the provision of air traffic control.

2.10.3.2 A lower limit of a control area shall be established at a height above the ground or water of not less than 200 m (700 ft).

Note – This does not imply that the lower limit has to be established uniformly in a given control area.

2.10.3.2.1 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 2.10.3.2.

2.10.3.2.2 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 to MCAR-2.

Note – This implies that the selected VFR cruising level be such that expected local atmospheric pressure variations do not result in a lowering of this limit to a height of less than 200 m (700 ft) above ground or water.

2.10.3.3 An upper limit of a control area shall be established 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. When established, such upper limit shall coincide with a VFR cruising level of the tables in Appendix 3 to MCAR-2

2.10.4 Flight information regions or control areas in the upper airspace

Where it is desirable to limit the number of flight information regions or control areas through which high flying aircraft would otherwise have to operate, a flight information region or control area, as appropriate, should be delineated to include the upper airspace within the lateral limits of a number of lower flight information regions or control areas.

2.10.5 CONTROL ZONES

2.10.5.1 The lateral limits of control zones shall encompass at least those portions of the airspace, which are not within control areas, containing the paths of IFR flights arriving at and departing from aerodromes to be used under instrument meteorological conditions.

Note – Aircraft holding in the vicinity of aerodromes are considered as arriving aircraft.

2.10.5.2 The lateral limits of a control zone shall 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.

Note – A control zone may include two or more aerodromes situated close together.

2.10.5.3 If a control zone is located within the lateral limits of a control area, it shall extend upwards from the surface of the earth to at least the lower limit of the control area.

Note – An upper limit higher than the lower limit of the overlying control area may be established when desired.

2.10.5.4 If a control zone is located outside of the lateral limits of a control area, an upper limit should be established.

2.10.5.5 If it is desired to establish the upper limit of a control zone at a level higher than the lower limit of the control area established above it, or if the control zone is located outside of the lateral limits of a control area, its upper limit should be established at a level which can easily be identified by pilots. When this limit is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 to MCAR-2.

2.11 Identification of Air Traffic Services Units and Airspaces

2.11.1 It is recommended that an area control centre or flight information centre should be identified by the name of a nearby town or city or geographic feature.

2.11.2 It is recommended that an aerodrome control tower or approach control unit should be identified by the name of the aerodrome at which it is located.

2.11.3 It is recommended that a control zone, control area or flight information region should be identified by the name of the unit having jurisdiction over such airspace.

2.12 Establishment and Identification of ATS Routes

2.12.1 When ATS routes are established, a protected airspace along each ATS route and a safe spacing between adjacent ATS routes shall be provided.

2.12.2 Special routes should be established for use by low-level traffic, including helicopters operating to and from helidecks on the high seas. When determining the lateral spacing between such routes, account should be taken of the navigational means available and the navigation equipment carried on board helicopters.

2.12.3 ATS routes shall be identified by designators.

2.12.4 Designators for ATS routes other than standard departure and arrival routes shall be selected in accordance with the principles set forth in Appendix 1 of this MCAR.

2.12.5 Standard departure and arrival routes and associated procedures shall be identified in accordance with the principles set forth in Appendix 3 of this MCAR.

2.13 Establishment of Change-Over Points

2.13.1 Change-over points should be established on ATS route segments defined by reference to very high frequency omni-directional radio ranges where this will assist accurate navigation along the route segments. The establishment of change-over points should be limited to route segments of 110 km (60 NM) or more, except where the complexity of ATS routes, the density of navigation aids or other technical and operational reasons warrant the establishment of change-over points on shorter route segments.

2.13.2 The change-over point on a route segment should be the mid-point between the facilities in the case of a straight route segment or the intersection of radials in the case of a route segment which changes direction between the facilities.

Note – Guidance on the establishment of change-over points is contained in Attachment A.

2.14 Establishment and Identification of Significant Points

2.14.1 Significant points shall be established for the purpose of defining an ATS route and/or in relation to the requirements of air traffic services for information regarding the progress of aircraft in flight.

2.14.2 Significant points shall be identified by designators.

2.14.3 Significant points shall be established and identified in accordance with the principles set forth in Appendix 2 of this MCAR.

2.15 Establishment and Identification of Standard Routes for Taxiing Aircraft

2.15.1 Where necessary, standard routes for taxiing aircraft should be established on an aerodrome between runways, aprons and maintenance areas. Such routes should be direct, simple and where practicable, designed to avoid traffic conflicts.

2.15.2 Standard routes for taxiing aircraft should be identified by designators distinctively different from those of the runways and ATS routes.

2.16 Coordination between the Operator and Air Traffic Services

2.16.1 Air traffic services units, in carrying out their objectives, shall have due regard for the requirements of the operators consequent on their obligations as specified in MCAR-OPS 1, and, if so required by the operators, shall make 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.

2.16.2 When so requested by an operator, messages (including position reports) received by air traffic services units and relating to the operation of the aircraft for which operational control service is provided by that operator shall, so far as practicable, be made available immediately to the operator or a designated representative in accordance with locally agreed procedures.

Note – For aircraft subjected to unlawful interference, see MCAR-2, Attachment B.

2.17 Coordination between Military Authorities and Air Traffic Services

2.17.1 Air traffic services authorities shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft.

2.17.2 Coordination of activities potentially hazardous to civil aircraft shall be effected in accordance with 2.18.

2.17.3 Arrangements shall be made to permit information relevant to the safe and expeditious conduct of flights of civil aircraft to be promptly exchanged between air traffic services units and appropriate military units.

2.17.3.1 Air traffic services 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, air traffic services authorities shall designate any areas or routes where the requirements of MCAR-2 concerning flight plans, two-way communications and position reporting apply to all flights to ensure that all pertinent data is available in appropriate air traffic services units specifically for the purpose of facilitating identification of civil aircraft.

Note – For aircraft subjected to unlawful interference, see MCAR-2, Attachment B.

2.17.3.2 Special procedures shall be established in order to ensure that:

a) air traffic services 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.

2.18 Coordination of Activities Potentially Hazardous to Civil Aircraft

2.18.1 The arrangements for activities potentially hazardous to civil aircraft, whether over the territory of Maldives or over the high seas shall be coordinated with the ANSP. The coordination shall be effected early enough to permit timely promulgation of information regarding the activities in accordance with AIS requirements.

2.18.2 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.

2.18.2.1 It is recommended that in determining these arrangements the following should be applied:

a) the locations or areas, times and durations for the activities should be selected to avoid closure or realignment of established ATS routes, blocking of the most economic flight levels, or delays of scheduled aircraft operations, unless no other options exist;
b) the size of the airspace designated for the conduct of the activities should be kept as small as possible;
c) direct communication between the ANSP or air traffic services unit and the organization or unit conducting the activities should be provided for use in the event that civil aircraft emergencies or other unforeseen circumstances require discontinuation of the activities.

2.18.3 ANSP shall be responsible for initiating the promulgation of information regarding the activities.

2.18.4 It is recommended that if activities potentially hazardous to civil aircraft take place on a regular or continuing basis, special committees should be established as required to ensure that the requirements of all parties concerned are adequately coordinated.

2.18.5 Adequate steps shall be taken to prevent emission of laser beams from adversely affecting flight operations.

Note 1 – Guidance material regarding the hazardous effects of laser emitters on flight operations is contained in the Manual on Laser Emitters and Flight Safety (*Doc 9815*).

2.18.6 In order to provide added airspace capacity and to improve efficiency and flexibility of aircraft operations, procedures shall be established for flexible use of airspace reserved for military or other special activities.
The procedures should permit all airspace users to have safe access to such reserved airspace.

2.19 Aeronautical Data

2.19.1 Determination and reporting of air traffic services related aeronautical data shall be in accordance with the accuracy and integrity requirements set forth in Tables 1 to 5 contained in Appendix 5 while taking into account the established quality system procedures. Accuracy requirements for aeronautical data are based upon a 95 per cent confidence level, and in that respect three types of positional data shall be identified: surveyed points (e.g. navigation aids positions), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points).

Note – Specifications governing the quality system are given in MCAR-15, Chapter 3.

2.19.2 ANSP shall ensure that integrity of aeronautical data is maintained throughout the data process from survey/origin to the next intended user. Based on the applicable integrity classification, the validation and verification procedures shall:

a) for routine data: avoid corruption throughout the processing of the data;
b) for essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and
c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance procedures to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Note – Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data.

2.19.3 Protection of electronic aeronautical data while stored or in transit shall be totally monitored by the cyclic redundancy check (CRC). To achieve protection of the integrity level of critical and essential aeronautical data as classified in 2.19.2, a 32- or 24- bit CRC algorithm shall apply respectively.

2.19.4 To achieve protection of the integrity level of routine aeronautical data as classified in 2.19.2, a 16- bit CRC algorithm should apply.

Note – Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, protection and traceability) is contained in the World Geodetic System – 1984 (WGS-84) Manual *(Doc 9674). Supporting material in respect of the provisions of Appendix 5 related to accuracy and integrity of aeronautical data is contained in RTCA Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77* – Industry Requirements for Aeronautical Information.

2.19.5 Geographical coordinates indicating latitude and longitude shall be determined and reported to the aeronautical information services authority in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum, identifying those geographical coordinates which have been transformed into WGS-84 coordinates by

mathematical means and whose accuracy of original field work does not meet the requirements in Appendix 5, Table 1.

2.19.6 The order of accuracy of the field work and determinations and calculations derived there from shall be such that the resulting operational navigation data for the phases of flight will be within the maximum deviations, with respect to an appropriate reference frame, as indicated in the tables contained in Appendix 5.

Note 1 – An appropriate reference frame is that which enables WGS-84 to be realized on a given position and with respect to which all coordinate data are related.

Note 2– Specifications governing the publication of aeronautical data are given in MCAR-4, Chapter 2 and MCAR-15, Chapter 3.

Note 3 – For those fixes and points that are serving a dual purpose, e.g. holding point and missed approach point, the higher accuracy applies.

2.20 Coordination between Meteorological and Air Traffic Services Authorities

2.20.1 To ensure that aircraft receive the most up-to-date meteorological information for aircraft operations, arrangements shall be made, where necessary, between meteorological and air traffic services authorities for air traffic services personnel:

a) in addition to using indicating instruments, to report, if observed by air traffic services personnel or communicated by aircraft, such other meteorological elements as may be agreed upon;
b) to report as soon as possible to the associated meteorological office meteorological phenomena of operational significance, if observed by air traffic services personnel
c) or communicated by aircraft, which have not been included in the aerodrome meteorological report;
d) to report as soon as possible to the associated meteorological office pertinent information concerning pre-eruption volcanic activity, volcanic eruptions and information concerning volcanic ash cloud. In addition, area control centres and flight information centres shall report the information to the associated meteorological watch office and volcanic ash advisory centres (VAACs).

2.20.2 Close coordination shall be maintained 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.

2.21 Coordination between Aeronautical Information Services and Air Traffic Services Authorities

2.21.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and

air traffic services authorities responsible for air traffic services to report to the responsible aeronautical information services unit, with a minimum of delay:

a) information on aerodrome conditions;
b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
c) the occurrence of volcanic activity observed by air traffic services personnel or reported by aircraft; and
d) any other information considered to be of operational significance.

2.21.2 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by the aeronautical information service for the preparation, production and issuance of relevant material for promulgation. To ensure timely provision of the information to the aeronautical information service, close coordination between those services concerned is therefore required.

2.21.3 Of particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the Aeronautical Information Regulation and Control (AIRAC) system, as specified in MCAR-15, Chapter 6 and Appendix 4. The predetermined, internationally agreed AIRAC effective dates in addition to 14 days postage time shall be observed by the responsible air traffic services when submitting the raw information/data to aeronautical information services.

2.21.4 The air traffic services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall do so while taking into account accuracy and integrity requirements for aeronautical data as specified in Appendix 5 to this MCAR.

Note 1 – Specifications for the issue of a NOTAM, are contained in MCAR-15, Chapter 5

Note 2 – 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.

2.22 Minimum Flight Altitudes

Minimum flight altitudes shall be determined and promulgated for each ATS route and control area over its territory. The minimum flight altitudes determined shall provide a minimum clearance above the controlling obstacle located within the areas concerned.

Note - Information on Minimum flight altitudes for each ATS route and control area is available in AIP Maldives.

2.23 Service to Aircraft in the Event of an Emergency

2.23.1 An aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference, shall be given maximum consideration, assistance and priority over other aircraft as may be necessitated by the circumstances.

Note – To indicate that it is in a state of emergency, an aircraft equipped with an appropriate data link capability and/ or an SSR transponder might operate the equipment as follows:

a) on Mode A, Code 7700; or
b) on Mode A, Code 7500 , to indicate specifically that it is being subjected to unlawful interference; or
c) activate the appropriate emergency and/or urgency capability of ADS; or
d) transmit the appropriate emergency message via CPDLC.

2.23.1.1 In communications between ATS units and aircraft in the event of an emergency, Human Factors principles shall be observed.

Note – Guidance material on Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).

2.23.2 When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall attend promptly to requests by the aircraft. Information pertinent to the safe conduct of the flight continues to be transmitted and necessary action shall be taken to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft.

2.23.3 When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall, in accordance with the Airport Emergency Plan (AEP), immediately inform the appropriate authority and exchange necessary information with the operator or its designated representative.

Note 1 – A strayed or unidentified aircraft may be suspected as being the subject of unlawful interference. See 2.24.1.3.

Note 2 – Procedures relating to the handling of strayed or unidentified aircraft are contained in 2.24.1.

Note 3 – PANS-ATM (Doc 4444), Chapter 15, 15.1.3 contains more specific procedures related to unlawful interference.

2.24 In-Flight Contingencies

2.24.1 STRAYED ON 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.

2.24.1.1 As soon as an air traffic services unit becomes aware of a strayed aircraft it shall take all necessary steps as outlined in 2.24.1.1.1 and 2.24.1.1.2 to assist the aircraft and to safeguard its flight.

Note – Navigational assistance by an air traffic services unit is particularly important if the unit becomes aware of an aircraft straying, or about to stray, into an area where there is a risk of interception or other hazard to its safety.

2.24.1.1.1 If the aircraft's position is not known, the air traffic services 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).

2.24.1.1.2 When the aircraft's position is established, the air traffic services 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.

2.24.1.2 As soon as an air traffic services unit becomes aware of an unidentified aircraft in its area, it shall endeavor to establish the identity of the aircraft whenever this is necessary for the provision of air traffic services or required by the appropriate military authorities in accordance with locally agreed procedures. To this end, the air traffic services unit shall take such of the following steps as are appropriate in the circumstances:

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

b) inquire of other air traffic services units within the flight information region about the flight and request their assistance in establishing two-way communication with the aircraft;
c) inquire of air traffic services 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.

2.24.1.2.1 The air traffic services unit shall as necessary, inform the appropriate military unit as soon as the identity of the aircraft has been established.

2.24.1.3 Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the CAA and the appropriate military unit shall immediately be informed.

2.24.2 INTERCEPTION OF CIVIL AIRCRAFT

2.24.2.1 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 safety of 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.

2.24.2.2 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 2.24.2.1;
b) relay messages between the intercepted aircraft and the ATS unit, the intercept control unit or the intercepting aircraft.

2.25 Time in Air Traffic Services

2.25.1 Air traffic services units shall use Coordinated Universal Time (UTC) and shall express the time in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

2.25.2 Air traffic services units shall be equipped with clocks indicating the time in hours, minutes and seconds, clearly visible from each operating position in the unit concerned.

2.25.3 Air traffic services unit clocks and other time recording devices shall be 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.

2.25.4 The correct time shall be obtained from a standard time station or, if not possible, from another unit which has obtained the correct time from such station.

2.25.5 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. Air traffic services units shall, in addition, provide aircraft with the correct time on request. Time checks shall be given to the nearest half minute.

2.26 Establishment of Requirements for Carriage and Operation of Pressure-Altitude Reporting Transponders

Requirements for carriage and operation of pressure-altitude reporting transponders within defined portion of airspace has been given in MCAR-OPS 1, Subpart L.

2.27 Safety Management

Refer Air Safety Circular ASC 00-2 Safety Management System.

2.28 Common Reference Systems

2.28.1 HORIZONTAL REFERENCE SYTEM

World Geodetic System – 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for air navigation. Reported aeronautical geographical coordinates (indicating latitude and longitude) shall be 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 *(Doc 9674).*

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

2.28.3 TEMPORAL REFERENCE SYSTEM

2.28.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for air navigation.

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

2.29 Language Proficiency

2.29.1 An air traffic services provider shall ensure that air traffic controllers speak and understand the English language for radiotelephony communications as per ATC licensing requirements in MCAR-65.

2.29.2 English language shall be used for all radiotelephony communications and inter unit co-ordinations

2.30 Contingency Arrangements

Air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

Note 1 – Guidance material relating to the development, promulgation and implementation of contingency plans is contained in Attachment D.

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.

2.31 Identification and Delineation of Prohibited, Restricted and Danger Areas

2.31.1 Each prohibited area, restricted area, or danger area established shall, upon initial establishment, be given an identification and full details shall be promulgated.

Note – See MCAR-15, Appendix 1, ENR 5.1.

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

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

a) nationality letters for location indicators assigned to the Maldives which has established the airspace;
b) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and
c) a number, unduplicated within the Maldivian territory.

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

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

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

CHAPTER 3 – Air Traffic Control Service

3.1 Application

Air traffic control service shall be 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 parts of air traffic control service described in 2.3.1 shall be 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 be assigned to an aerodrome control tower or to a separate unit.

3.3 Operation of Air Traffic Control Service

3.3.1 In order to provide air traffic control service, an air traffic control unit shall:

a) be provided with information on the intended movement of each aircraft, or variations therefrom, and with current information on the actual progress of each aircraft;
b) determine from the information received, the relative positions of known aircraft to each other;
c) issue clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic;

d) coordinate clearances as necessary with other units:

1. whenever an aircraft might otherwise conflict with traffic operated under the control of such other units;
2. before transferring control of an aircraft to such other units.

3.3.2 Information on aircraft movements, together with a record of air traffic control clearances issued to such aircraft, shall be so displayed as to permit ready analysis in order to maintain an efficient flow of air traffic with adequate separation between aircraft.

3.3.3 Clearances issued by air traffic control units shall 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

3.3.4 Air traffic control units should be equipped with devices that record background communication and the aural environment at air traffic controller work stations, capable of retaining the information recorded during at least the last twenty-four hours of operation.

3.3.5 Separation by an air traffic control unit shall be obtained by at least one of the following:

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

1. the appropriate tables of cruising levels in Appendix 3 of MCAR-2
2. a modified table of cruising levels, when so pre-scribed in accordance with Appendix 3 of MCAR-2 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 indifferent 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 (Doc 9426).

3.3.5.1 For all airspace where a reduced vertical separation minimum of 300 m (1000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the implementation and continued application of this vertical separation minimum meets the safety objectives. The coverage of the height monitoring facilities provided under this programme shall be adequate to permit monitoring of the relevant aircraft types of all operators who operate in RVSM airspace.

Note – The number of separate monitoring programmes should be restricted to the minimum necessary to effectively provide the required services for the region.

3.3.5.2 Monitoring Agency for Asia Region (MAAR) operated by AEROTHAI is the designated agency for RVSM monitoring programme of Maldives airspace. Air Traffic Service Providers are required to submit Large Height Deviation (LHD) reports to MAAR regularly on prescribed intervals. Soft copy of the same shall also be provided to Air Navigation Inspectorate.

Note – Guidance material relating to monitoring of height-keeping performance is contained in ICAO Manual on Implementation of a 1000 ft Vertical Separation Minimum between FL290 and FL410 Inclusive (Doc 9574).

3.4 Separation Minima

3.4.1 The selection of separation minima for application within a given portion of airspace shall be as follows:

a) the separation minima shall be selected from the provisions prescribed in ATM Standards Manual. If standards manual is not available PANS ATM Document 4444 and *Part 1 of the Regional Supplementary Procedures (Doc 7030) shall be applicable.*
b) the separation minima shall be selected from those authorized in the letter of agreements with adjacent ATS Units responsible for the provision of air traffic services in neighboring airspace when;
   i. traffic will pass to neighboring airspaces;
   ii. routes are closer to the common boundary of the neighboring airspaces than the separation minima applicable in the circumstances.

Note – The purpose of this provision is to ensure, in the first case, compatibility on both sides of the line of transfer of traffic, and, in the other case, adequate separation between aircraft operating on both sides of the common boundary.

3.4.2 Details of the selected separation minima and of their areas of application shall be 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

A controlled flight shall be 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

Responsibility for the control of all aircraft operating within a given block of airspace shall be vested in a single air traffic control unit. However, control of an aircraft or groups of aircraft may be delegated to other air traffic control units provided 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 responsibility for the control of an aircraft shall be 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 control area boundary as estimated by the area control centre having control of the aircraft or at such other point or 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 the ground, 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.

Note – See Note following 3.6.1.3.1.

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 Responsibility for control of an aircraft shall not be transferred from one air traffic control unit to another without the consent of the accepting control unit, which shall be obtained 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 transferring control unit shall communicate 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 radar data or ADS-B data, the control information pertinent to the transfer shall include information regarding the position and, if required, the track and speed of the aircraft, as observed by radar immediately prior to the transfer.

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

3.6.2.3 The accepting control unit shall:

a) indicate 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 such indication is understood to signify acceptance of the terms specified, or indicate any necessary changes thereto; and
b) specify any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer.

3.6.2.4 The accepting control unit shall notify the transferring control unit when it has established two-way voice and/or data link communications with and assumed control of the aircraft concerned, unless otherwise specified by agreement between the two control units concerned.

3.6.2.5 Applicable coordination procedures, including transfer of control points, shall be specified in letters of agreement and ATS unit instructions as appropriate.

3.7 Air Traffic Control Clearances

Air traffic control clearances shall be based solely on the requirements for providing air traffic control service.

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 MCAR-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 be automatically cancelled if the flight has not been commenced.

3.7.1.2 Standard departure and arrival routes and associated procedures shall be established when necessary to facilitate:

a) the safe, orderly and expeditious flow of air traffic;
b) the description of the route and procedure in air traffic control clearances.

Note - Material relating to the establishment of standard departure and arrival routes and associated procedures is contained in the Air Traffic Services Planning Manual (Doc 9426). The design criteria are contained in PANS-OPS, Volume II (Doc 8168).

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 The air traffic control clearance relating to the deceleration and descent of an aircraft from supersonic cruise to subsonic flight should provide for uninterrupted descent, at least during the transonic phase.

3.7.3 Read-back of clearances and safety-related information

3.7.3.1 The flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read back:

a) ATC route clearances;
b) clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any 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 Other clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.

3.7.3.1.2 The controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.

3.7.3.2 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 ICAO Annex 10, Volume II and PANS-ATM, Chapter 14.

3.7.4 CORDINATION OF CLEARANCE

An air traffic control clearance shall be coordinated between air traffic control units to cover the entire route of an aircraft or a specified portion thereof as follows.

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 expediting departing 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 the one 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 When prescribed by the ANSP, aircraft shall contact a downstream air traffic control unit, for the purpose of receiving a downstream clearance prior to the transfer of control point.

3.7.4.2.1.1 Aircraft shall maintain the necessary two-way communication with the current air traffic control unit whilst obtaining a downstream clearance.

3.7.4.2.1.2 A clearance issued as a downstream clearance shall be clearly identifiable as such to the pilot.

3.7.4.2.1.3 Unless coordinated, downstream clearances shall not affect the aircraft's original flight profile in any airspace, other than that of the air traffic control unit responsible for the delivery of the downstream clearance.

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

3.7.4.2.1.4 Where practicable and where data link communications are used to facilitate downstream clearance delivery, two-way voice communications between the pilot and the air traffic control unit providing the downstream clearance should be available.

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, coordination with the subsequent area control centre shall be 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. Such clearance or revisions thereto shall apply only to those portions of the flight conducted within controlled airspace.

3.7.5 Air traffic flow management

3.7.5.1 Air traffic flow management (ATFM) shall be implemented for airspace where air traffic demand at times exceeds, or is expected to exceed, the declared capacity of the air traffic control services concerned.

3.7.5.2 ATFM shall be implemented on the basis of regional air navigation agreements or, if appropriate, through multilateral agreements. Such agreements should make provision for common procedures and common methods of capacity determination.

3.7.5.3 When it becomes apparent to an ATC unit that traffic additional to that already accepted cannot be accommodated within a given period of time at a particular location or in a particular area, or can only be accommodated at a given rate, that unit shall so advise the ATFM unit, when such is established, as well as, when appropriate, ATS units concerned. Flight crews of aircraft destined to the location or area in question and operators concerned shall also be advised of the delays expected or the restrictions that will be applied.

Note – Operators concerned will normally be advised, in advance where possible, of restrictions imposed by the air traffic flow management unit when such is established.

3.8 Control of Persons and Vehicles at Aerodromes

3.8.1 The movement of persons or vehicles including towed aircraft on the manoeuvring area of an aerodrome shall be controlled by the aerodrome control tower as necessary 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:

a) persons and vehicles operating on the manoeuvring area of an aerodrome shall be restricted to the essential minimum, and particular regard shall be given to the requirements to protect the ILS/MLS sensitive area(s) when Category II or Category III precision instrument operations are in progress;

b) subject to the provisions in 3.8.3, the minimum separation between vehicles and taxiing aircraft shall be as prescribed by the ANSPANSP taking into account the aids available;
c) when mixed ILS and MLS Category II or Category III precision instrument operations are taking place to the same runway continuously, the more restrictive ILS or MLS critical and sensitive areas shall be protected.

3.8.3 Emergency vehicles proceeding to the assistance of an aircraft in distress shall be afforded priority over all other surface movement traffic.

3.8.4 Subject to the provisions in 3.8.3, vehicles on the manoeuvring area shall be required to comply with the following rules:

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), vehicles and vehicles towing aircraft shall comply with instructions issued by the aerodrome control tower.

3.9 Provision of Radar and ADS-B

3.9.1 Radar and ADS-B ground systems should provide 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)

3.10.1 In the absence of visual observation of all or part of the manoeuvring area or to supplement visual observation, surface movement radar (SMR) or other suitable surveillance equipment, should be utilized to:

a) monitor the movements of aircraft and vehicles on the manoeuvring area;
b) provide directional information to pilots and vehicle drivers as necessary; and
c) provide advice and assistance for the safe and efficient movement of aircraft and vehicles on the manoeuvring area.

Note – See the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476), the Manual on Advanced-Surface Movement Guidance and Control Systems (A-SMCGS) (Doc 9830) and the Air Traffic Services Planning Manual (Doc 9426) for guidance on the use of SMR.

CHAPTER 4 – Flight Information Service

4.1 Application

4.1.1 Flight information service shall be provided 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 air traffic services 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 air traffic services units provide both flight information service and air traffic control service, the provision of air traffic control service shall have 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 receiving 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 Flight information service shall include 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, ice or significant depth of water;
f) information on unmanned free balloons; and of any other information likely to affect safety.

4.2.2 Flight information service provided to flights shall include, in addition to that outlined in 4.2.1, the provision of information concerning:

a) weather conditions reported or forecast at departure, destination and alternate aerodromes;
b) collision hazards, to aircraft operating in airspace Classes C, D, E, F and G;
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 C.

4.2.3 ATS units should transmit, as soon as practicable, special air-reports to other aircraft concerned, to the associated meteorological office, and to other ATS units concerned. Transmissions to aircraft should be continued for a period to be determined by agreement between the meteorological and air traffic services authorities concerned.

4.2.4 Flight information service provided to VFR flights shall include, in addition to that outlined in 4.2.1, 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.

4.3 Operational Flight Information Service Broadcasts

4.3.1 APPLICATION

4.3.1.1 The meteorological information and operational information concerning radio navigation services and aerodromes included in the flight information service shall, whenever available, be provided in an operationally integrated form.

4.3.1.2 Where integrated operational flight information messages are to be transmitted to aircraft, they should be transmitted with the content and, where specified, in the sequence indicated, for the various phases of flight.

4.3.1.3 Operational flight information service broadcasts, when provided, should consist of messages containing integrated information regarding selected operational and meteorological elements appropriate to the various phases of flight. These broadcasts should be of three major types, i.e. HF, VHF and ATIS.

4.3.1.4 Use of the OFIS messages in directed request/reply transmissions

When requested by the pilot, the applicable OFIS message(s) shall be transmitted by the appropriate ATS unit.

4.3.2 HF OPERATIONAL FLIGHT INFORMATION SERVICE (OFIS) BROADCASTS

4.3.2.1 HF operational flight information service (OFIS) broadcasts should be provided when it has been determined by regional air navigation agreements that a requirement exists.

4.3.2.2 Whenever such broadcasts are provided it is recommended that:

a) the information should be in accordance with 4.3.2.5, as applicable, subject to regional air navigation agreements;
b) the aerodromes for which reports and forecasts are to be included should be as determined by regional air navigation agreements;
c) the time-sequencing of stations participating in the broadcast should be as determined by regional air navigation agreements;
d) the HF OFIS broadcast message should take into consideration human performance. The broadcast message should not exceed the length of time allocated for it by regional air navigation agreements, care being taken that the readability is not impaired by the speed of the transmission;

Note – *Guidance material on human performance can be found in the* Human Factors Training Manual *(Doc 9683)*.

e) each aerodrome message should be identified by the name of the aerodrome to which the information applies;
f) when information has not been received in time for a broadcast, the latest available information should be included together with the time of that observation;
g) the full broadcast message should be repeated if this is feasible within the remainder of the time allotted to the broadcasting station;
h) the broadcast information should be updated immediately a significant change occurs; and
i) the HF OFIS message should be prepared and disseminated by the most appropriate unit(s) as designated by the CAA, Maldives

4.3.2.3 Pending the development and adoption of a more suitable form of speech for universal use in aeronautical radiotelephony communications, HF OFIS broadcasts concerning aerodromes designated for use by international air services shall be available in the English language.

4.3.2.4 Where HF OFIS broadcasts are available in more than one language, it is recommended that a discrete channel shall be used for each language.

4.3.2.5 HF operational flight information service broadcast messages should contain the following information in the sequence indicated or as determined by regional air navigation agreements:

a) En-route weather information on significant en-route weather phenomena should be in the form of available SIGMET as prescribed in MCAR-3.
b) Aerodrome information including:
   1. name of aerodrome;
   2. time of observation;
   3. essential operational information;
   4. surface wind direction and speed; if appropriate, maximum wind speed;
   *5. visibility and, when applicable, runway visual range (RVR);

*6. present weather
*7. cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available; and
8. aerodrome forecast.

*These elements are replaced by the term "CAVOK", whenever the conditions as specified in the PANS-ATM (Doc 4444), Chapter 11 prevail.

4.3.3 VHF operational flight information service (OFIS) broadcasts

4.3.3.1 VHF operational flight information service broadcasts should be provided as determined by regional air navigation agreements.

4.3.3.2 Whenever such broadcasts are provided, it is recommended that:

a) the aerodromes for which reports and forecasts are to be included should be as determined by regional air navigation agreements;
b) each aerodrome message should be identified by the name of the aerodrome to which the information applies;
c) when information has not been received in time for a broadcast, the latest available information should be included together with the time of that observation;
d) the broadcasts should be continuous and repetitive;
e) The VHF OFIS broadcast message should take into consideration human performance. The broadcast message should, whenever practicable, not exceed five minutes, care being taken that the readability is not impaired by the speed of the transmission;

Note – Guidance material on human performance can be found in the Human Factors Training Manual (Doc 9683).

f) the broadcast message should be updated on a scheduled basis as determined by regional air navigation agreements. In addition it should be expeditiously updated immediately a significant change occurs; and
g) the VHF OFIS message should be prepared and disseminated by the most appropriate unit(s) as designated by the CAA.

4.3.3.3 Pending the development and adoption of a more suitable form of speech for universal use in aeronautical radiotelephony communications, VHF OFIS broadcasts concerning aerodromes designated for use by international air services shall be available in the English language.

4.3.3.4 Where VHF OFIS broadcasts are available in more than one language, a discrete channel shall be used for each language.

4.3.3.5 VHF operational flight information service broadcast messages should contain the following information in the sequence indicated:
a) name of aerodrome;

b) time of observation;
c) landing runway;
d) significant runway surface conditions and, if appropriate, braking action;
e) changes in the operational state of the radio navigation services, if appropriate;
f) holding delay, if appropriate;
g) surface wind direction and speed; if appropriate, maximum wind speed;
h) visibility and, when applicable, runway visual range (RVR);
i) present weather;
j) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility, when available;
k) air temperature;
l) dew point temperature;
m) QNH altimeter setting;
n) supplementary information on recent weather of operational significance and, where necessary, wind shear;
o) trend forecast, when available; and
p) notice of current SIGMET messages.

* These elements are replaced by the term "CAVOK", whenever the conditions as specified in the PANS-ATM (Doc 4444), Chapter 11 prevail.

4.3.4 Voice-automatic terminal information service (Voice-ATIS) broadcasts

4.3.4.1 Voice-automatic terminal information service (Voice-ATIS) broadcasts shall be provided at aerodromes where there is a requirement to reduce the communication load on the ATS VHF air-ground communication channels. When provided, they shall comprise:

a) one broadcast serving arriving aircraft; or
b) one broadcast serving departing aircraft; or
c) one broadcast serving both arriving and departing aircraft; or
d) two broadcasts serving arriving and departing aircraft respectively at those aerodromes where the length of a broadcast serving both arriving and departing aircraft would be excessively long.

4.3.4.2 A discrete VHF frequency shall, whenever practicable, be used for Voice-ATIS broadcasts. If a discrete frequency is not available, the transmission may be made on the voice channel(s) of the most appropriate terminal navigation aid(s), preferably a VOR, provided the range and readability are adequate and the identification of the navigation aid is sequenced with the broadcast so that the latter is not obliterated.

4.3.4.3 Voice-ATIS broadcasts shall not be transmitted on the voice channel of an ILS.

4.3.4.4 Whenever Voice-ATIS is provided, the broadcast shall be continuous and repetitive.

4.3.4.5 The information contained in the current broadcast shall immediately be made known to the ATS unit(s) concerned with the provision to aircraft of information relating to

approach, landing and take-off, whenever the message has not been prepared by that (those) unit(s).

Note – The requirements for the provision of ATIS that applies to both Voice-ATIS and D-ATIS are contained in 4.3.6 below.

4.3.4.6 Voice-ATIS broadcasts provided at designated aerodromes for use by international air services shall be available in the English language as a minimum.

4.3.4.7 *Where Voice-ATIS broadcasts are available in more than one language, a discrete channel shall be used for each language.*

Note – Guidance material on human performance can be found in the Human Factors Training Manual (Doc 9683).

4.3.5 Data link-automatic terminal information service (D-ATIS)

4.3.5.1 Where a D-ATIS supplements the existing availability of Voice-ATIS, the information shall be identical in both content and format to the applicable Voice-ATIS broadcast.

4.3.5.1.1 Where real-time meteorological information is included but the data remains within the parameters of the significant change criteria, the content, for the purpose of maintaining the same designator, shall be considered identical.

Note – Significant change criteria are specified in 2.3.2 of Appendix 3 to MCAR-3.

4.3.5.2 Where a D-ATIS supplements the existing availability of Voice-ATIS and the ATIS requires updating, Voice-ATIS and D-ATIS shall be updated simultaneously.

Note – Guidance material relating to D-ATIS is contained in the Manual of Air Traffic Services Data Link Applications *(Doc 9694). The technical requirements for the D-ATIS application are contained in ICAO Annex 10, Volume III, Part I, Chapter 3.*

4.3.6 AUTOMATIC TERMINAL INFORMATION SERVICE (voice and/or data link)

4.3.6.1 Whenever Voice-ATIS and/or D-ATIS is provided:

a) the information communicated shall relate to a single aerodrome;
b) the information communicated shall be updated immediately a significant change occurs;
c) the preparation and dissemination of the ATIS message shall be the responsibility of the air traffic services;
d) individual ATIS messages shall be identified by a designator in the form of a letter of the ICAO spelling alphabet. Designators assigned to consecutive ATIS messages shall be in alphabetical order;
e) aircraft shall acknowledge receipt of the information upon establishing communication with the ATS unit providing approach control service or the aerodrome control tower, as appropriate;

f) the ATS unit shall, when replying to the message in e) above or, in the case of arriving aircraft, at such other time as may be prescribed by the ANSP, provide the aircraft with the current altimeter setting; and
g) the meteorological information shall be extracted from the local meteorological routine or special report.

Note – In accordance with Sections 4.1 and 4.3 of Appendix 3 to MCAR-3, the surface wind direction and speed and runway visual range (RVR) are to be averaged over 2 minutes and 1 minute, respectively; and the wind information is to refer to conditions along the runway for departing aircraft and to conditions at the touchdown zone for arriving aircraft. A template for the local meteorological report, including the corresponding ranges and resolutions of each element, are in Appendix 3 to MCAR-3. Additional criteria for the local meteorological report are contained in Chapter 4 of, and in Attachment D to, MCAR-3.

4.3.6.2 When rapidly changing meteorological conditions make it inadvisable to include a weather report in the ATIS, the ATIS messages shall indicate that the relevant weather information will be given on initial contact with the ATS unit.

4.3.6.3 Information contained in a current ATIS, the receipt of which has been acknowledged by the aircraft concerned, need not be included in a directed transmission to the aircraft, with the exception of the altimeter setting, which shall be provided in accordance with 4.3.6.1 f).

4.3.6.4 If an aircraft acknowledges receipt of an ATIS that is no longer current, any element of information that needs updating shall be transmitted to the aircraft without delay.

4.3.6.5 Contents of ATIS should be kept as brief as possible. Information additional to that specified in 4.3.7 to 4.3.9, for example information already available in aeronautical information publications (AIPs) and NOTAM, should only be included when justified in exceptional circumstances.

4.3.7 ATIS for arriving and departing aircraft

ATIS messages containing both arrival and departure information shall contain the following elements of information in the order listed:

a) name of aerodrome;
b) arrival and/or departure indicator;
c) contract type, if communication is via D-ATIS;
d) designator;
e) time of observation, if appropriate;
f) type of approach(es) to be expected;
g) the runway(s) in use; status of arresting system constituting a potential hazard, if any;
h) significant runway surface conditions and, if appropriate, braking action;
i) holding delay, if appropriate;
j) transition level, if applicable;
k) other essential operational information;

l) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
*m) visibility and, when applicable, RVR;
*n) present weather;
*o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
p) air temperature;
Δq) dew point temperature;
r) altimeter setting(s);
s) any available information on significant meteorological phenomena in the approach and climb-out areas including wind shear, and information on recent weather of operational significance;
t) trend forecast, when available; and
u) specific ATIS instructions.

* These elements are replaced by the term "CAVOK", whenever the conditions as specified in the PANS-ATM (Doc 4444), Chapter 11 prevail.
Δ As determined on the basis of regional air navigation agreements.

4.3.8 ATIS for arriving aircraft. ATIS messages containing arrival information only shall contain the following elements of information in the order listed:

a) name of aerodrome;
b) arrival indicator;
c) contract type, if communication is via D-ATIS;
d) designator;
e) time of observation, if appropriate;
f) type of approach(es) to be expected;
g) main landing runway(s); status of arresting system constituting a potential hazard, if any;
h) significant runway surface conditions and, if appropriate, braking action;
i) holding delay, if appropriate;
j) transition level, if applicable;
k) other essential operational information;
l) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
*m) visibility and, when applicable, RVR;
*n) present weather;
*o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
p) air temperature;
Δq) dew point temperature;

r) altimeter setting(s);
s) any available information on significant meteorological phenomena in the approach area including wind shear, and information on recent weather of operational significance;
t) trend forecast, when available; and
u) specific ATIS instructions.

4.3.9 ATIS for departing aircraft ATIS messages containing departure information only shall contain the following elements of information in the order listed:

a) name of aerodrome;
b) departure indicator;
c) contract type, if communication is via D-ATIS;
d) designator;
e) time of observation, if appropriate;
f) runway(s) to be used for take-off; status of arresting system constituting a potential hazard, if any;
g) significant surface conditions of runway(s) to be used for take-off and, if appropriate, braking action;
h) departure delay, if appropriate;
i) transition level, if applicable;
j) other essential operational information;
k) surface wind direction and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
*l) visibility and, when applicable, RVR;
*m) present weather;
*n) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
o) air temperature;
Δp) dew point temperature;
q) altimeter setting(s);
r) any available information on significant meteorological phenomena in the climb-out area including wind shear;
s) trend forecast, when available; and
t) specific ATIS instructions.

* These elements are replaced by the term "CAVOK", whenever the conditions as specified in the PANS-ATM (Doc 4444), Chapter 11 prevail.

4.4 VOLMET BROADCASTS AND D-VOLMET SERVICE

4.4.1 HF and/or VHF VOLMET broadcasts and/or D-VOLMET service should be provided when it has been determined by regional air navigation agreements that a requirement exists.

Note – MCAR-3, 11.5 and 11.6 provide details of VOLMET broadcasts and D-VOLMET service.

4.4.2 VOLMET broadcasts should use standard radiotelephony phraseologies.

Note – Guidance on standard radiotelephony phraseologies to be used in VOLMET broadcasts is given in the Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377), Appendix 1.

CHAPTER 5 – Alerting Service

5.1 Application

5.1.1 Alerting service shall be provided:

a) for all aircraft provided with air traffic control service;
b) in so far as practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic services; and
c) to any aircraft known or believed to be the subject of unlawful interference.

5.1.2 Flight information centres or area control centres shall serve as the central point for collecting all information relevant to a state of emergency of an aircraft operating within the flight information region or control area concerned and for forwarding such information to the appropriate rescue coordination centre.

5.1.3 In the event of a state of emergency arising to an aircraft while it is under the control of an aerodrome control tower or approach control unit, such unit shall notify immediately the flight information centre or area control centre responsible which shall in turn notify the rescue coordination centre, except that notification of the area control centre, flight information centre, or rescue coordination centre shall not be required when the nature of the emergency is such that the notification would be superfluous.

5.1.3.1 Nevertheless, whenever the urgency of the situation so requires, the aerodrome control tower or approach control unit responsible shall first alert and take other necessary steps to set in motion all appropriate local rescue and emergency 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, air traffic services units shall, except as prescribed in 5.5.1, notify rescue coordination centres immediately an aircraft is considered to be in a state of emergency in accordance with the following:

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 air traffic services 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, or when

2. an aircraft has been cleared to land and fails to land within five minutes of the estimated time of 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 aircraft has been impaired, but not to the extent that a forced landing is likely, 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 aircraft is 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 shall contain such of the following information as is 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.

5.2.2.1 Part of the information specified in 5.2.2, which is not available at the time notification is made to a rescue coordination centre, should be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

5.2.3 Further to the notification in 5.2.1, the rescue coordination centre shall, without delay, be furnished with:

a) any useful additional information, especially on the development of the state of emergency through 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

Air traffic services units shall, as necessary, use all available communication facilities to endeavour 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

When a state of emergency is considered to exist, the flight of the aircraft involved shall be 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. The flights of other aircraft known to be operating in the vicinity of the aircraft involved shall also be plotted in order to determine their probable future positions and maximum endurance.

5.5 Information to the Operator

5.5.1 When an area control or a flight information centre decides that an aircraft is in the uncertainty or the alert phase, it shall, when practicable, advise the operator 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 All information notified to the rescue coordination centre by an area control or flight information centre shall, whenever practicable, also be communicated, without delay, to the operator.

5.6 Information to Aircraft Operating in the Vicinity of an Aircraft in a State of Emergency

5.6.1 When it has been established by an air traffic services unit that an aircraft is in a state of emergency, other aircraft known to be in the vicinity of the aircraft involved shall, except as provided in 5.6.2, be informed of the nature of the emergency as soon as practicable.

5.6.2 When an air traffic services unit knows or believes that an aircraft is being subjected to unlawful interference, no reference shall be made in ATS air-ground communications to the nature of the emergency unless it has first been referred to in communications from the aircraft involved and it is certain that such reference will not aggravate the situation.

CHAPTER 6 – Air Traffic Services Requirements for Communications

6.1 Aeronautical Mobile Service (Air-Ground Communications)

6.1.1 GENERAL

6.1.1.1 Radiotelephony and/or data link shall be used in air-ground communications for air traffic services purposes.

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

6.1.1.2 Where RCP types have been prescribed by the CAA for ATM functions, ATS units shall, in addition to the requirements specified in 6.1.1.1, be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP type(s).

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, recording facilities shall be provided on all such air-ground communication channels.

6.1.1.4 Recordings of communications channels as required in paragraph 6.1.1.3 shall be retained for a period of at least thirty days.

6.1.2 FOR FLIGHT INFORMATION SERVICE

6.1.2.1 Air-ground communication facilities shall enable two-way communications to take place between a unit providing flight information service and appropriately equipped aircraft flying anywhere within the flight information region.

6.1.2.2 Whenever practicable, air-ground communication facilities for flight information service should permit direct, rapid, continuous and static-free two-way communications.

6.1.3 FOR AREA CONTROL SERVICE

6.1.3.1 Air-ground communication facilities shall enable two-way communications to take place between a unit providing area control service and appropriately equipped aircraft flying anywhere within the control area(s).

6.1.3.2 Whenever practicable, air-ground communication facilities for area control service shall permit direct, rapid, continuous and static-free two-way communications.

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

6.1.4 FOR APPROACH CONTROL SERVICE

6.1.4.1 Air-ground communication facilities shall enable direct, rapid, continuous and static-free two-way communications to take place between the unit providing approach control service and appropriately equipped aircraft under its control.

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

6.1.5 FOR AERODROME CONTROL SERVICE

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

6.1.5.2 Where conditions warrant, separate communication channels shall be provided for the control of traffic operating on the manoeuvring area.

6.2 Aeronautical Fixed Service (Ground-Ground Communications)

6.2.1 GENERAL

6.2.1.1 Direct-speech and/or data link communications shall be used in ground-ground communications for air traffic services purposes.

Note – 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.

6.2.1.2 Where RCP types have been prescribed by States for ATM functions, ATS units shall, in addition to the requirements specified in 6.2.1.1, be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP type(s).

Note – Information on RCP and associated procedures, and guidance concerning the approval process, will be contained in the Manual on Required Communication Performance (RCP) (Doc 9869) (in preparation). This document also contains references to other documents produced by States and international bodies concerning communication systems and RCP.

6.2.2 COMMUNICATIONS WITHIN A FLIGHT INFORMATION REGION

6.2.2.1 Communications between air traffic services units

6.2.2.1.1 A flight information centre shall 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 air traffic services units and other units 6.2.2.2.1 A flight information centre and an area control centre shall 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 emergency service;
f) the international NOTAM office serving the centre.

6.2.2.2.2 An approach control unit and an aerodrome control tower shall have facilities for communications with the following units providing a service 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 shall include provisions for rapid and reliable communications between the air traffic services unit concerned and the military unit(s) responsible for control of interception operations within the area of responsibility of the air traffic services unit.

6.2.2.3 Description of communication facilities

6.2.2.3.1 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) shall include provisions for:

a) communications by direct speech alone, or in combination with data link communications, whereby for the purpose of transfer of radar control the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen seconds; 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 In all cases not covered by 6.2.2.3.1, the communication facilities shall include provisions for:

a) communications by direct speech alone, or in combination with data link communications, whereby the communications can normally be established within fifteen seconds; and
b) printed communications, when a written record is required; the message transit time for such communications being no longer than five minutes.

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

6.2.2.3.4 The communication facilities required in accordance with 6.2.2.1 and 6.2.2.2 shall be supplemented, as and where necessary, by facilities for other forms of visual or audio communications, for example, closed circuit television or separate information processing systems.

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

6.2.2.3.6 The communication facilities required under 6.2.2.2.2 d) shall include provisions for communications by direct speech arranged for conference communications, whereby the communications can normally be established within fifteen seconds.

6.2.2.3.7 All facilities for direct-speech or data link communications between air traffic services units and between air traffic services units and other units described under 6.2.2.2.1 and 6.2.2.2.2 shall be provided with automatic recording.

6.2.2.3.8 Recordings of data and communications as required in 6.2.2.3.3 and 6.2.2.3.7 shall be retained for a period of at least thirty days.

6.2.3 COMMUNICATIONS BETWEEN FLIGHT INFORMATIONS

6.2.3.1 Flight information centres and area control centres shall have 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 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 The communication facilities in 6.2.3.1.3 shall permit communications to be established normally within fifteen seconds.

6.2.3.2 Adjacent ATS units should 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 are such that it is necessary to clear aircraft into an adjacent control area prior to departure, an approach control unit and/ or aerodrome control tower shall be connected with the area control centre serving the adjacent area.

6.2.3.4 The communication facilities in 6.2.3.2 and 6.2.3.3 shall include provisions for communications by direct speech alone, or in combination with data link communications, with automatic recording, whereby for the purpose of transfer of control using radar or ADS data, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen seconds.

6.2.3.5 In all cases where automatic exchange of data between air traffic services computers is required, suitable facilities for automatic recording shall be provided.

6.2.3.6 Recordings of data and communications as required in 6.2.3.5 shall be retained for a period of at least thirty days.

6.2.4 PROCEDURES FOR DIRECT-SPEECH COMMUNICATIONS

Appropriate procedures for direct-speech communications shall be developed to permit immediate connections to be made for very urgent calls concerning the safety of aircraft, and the interruption, if necessary, of less urgent calls in progress at the time.

6.3 Surface Movement Control Service

6.3.1 Communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes.

6.3.1.1 Two-way radiotelephony communication facilities shall be provided for aerodrome control service for the control of vehicles on the manoeuvring area, except where communication by a system of visual signals is deemed to be adequate.

6.3.1.2 Where conditions warrant, separate communication channels shall be provided for the control of vehicles on the manoeuvring area. Automatic recording facilities shall be provided on all such channels.

6.3.1.3 Recordings of communications as required in 6.3.1.2 shall be retained for a period of at least thirty days.

6.4 Aeronautical Radio Navigation Service

6.4.1 Automatic recording of surveillance data

6.4.1.1 Surveillance data from primary and secondary radar equipment or obtained through ADS or other surveillance systems, used as an aid to air traffic services, shall be 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 Automatic recordings shall be retained for a period of at least thirty days. When the recordings are pertinent to accident and incident investigations, they shall be retained for longer periods until it is evident that they will no longer be required.

CHAPTER 7 – Air Traffic Services Requirements for Information

7.1 Meteorological Information

7.1.1 GENERAL

7.1.1.1 Air traffic services units shall be supplied with up-to-date information on existing and forecast meteorological conditions as necessary for the performance of their respective functions. The information shall be supplied in such a form as to require a minimum of interpretation on the part of air traffic services personnel and with a frequency which satisfies the requirements of the air traffic services units concerned.

7.1.1.2 It is recommended that air traffic services units should be supplied with available detailed information on the location, vertical extent, direction and rate of movement of meteorological phenomena in the vicinity of the aerodrome, and particularly in the climb-out and approach areas, which could be hazardous to *aircraft operations.*

Note – The meteorological phenomena are listed in MCAR-3, Chapter 4, 4.6.8

7.1.1.3 It is recommended that, when computer-processed upper air data are made available to air traffic services units in digital form for use by air traffic services computers, the contents, format and transmission arrangements should be as agreed between the Meteorological Authority and the ANSP.

7.1.2 FLIGHT INFORMATION CENTRES AND AREA CONTROL CENTRES

7.1.2.1 Flight information centres and area control centres shall be supplied with meteorological information as described in MCAR-3, Appendix 9, 1.3, particular emphasis being given to the occurrence or expected occurrence of weather deterioration as soon as this can be determined. These reports and forecasts shall cover 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 Flight information centres and area control centres shall be provided, at suitable intervals, with current pressure data for setting altimeters, for locations specified by the flight information centre or area control centre concerned.

7.1.3 UNITS PROVIDING APPROACH CONTROL SERVICE

7.1.3.1 Units providing approach control service shall be supplied with meteorological information as described in MCAR-3, Appendix 9, 1.2 for the airspace and the aerodromes with which they are concerned. Special reports and amendments to forecasts shall be communicated to the units providing approach control service as soon

as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast. Where multiple anemometers are used, the indicators to which they are related shall be clearly marked to identify the runway and section of the runway monitored by each anemometer.

Note – See Note following 7.1.2.1.

7.1.3.2 Units providing approach control service shall be provided with current pressure data for setting altimeters, for locations specified by the unit providing approach control service.

7.1.3.3 Units providing approach control service for final approach, landing and take-off shall be equipped with surface wind display(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the aerodrome control tower and in the meteorological station, where such a station exists.

7.1.3.4 Units providing approach control service for final approach, landing and take-off at aerodromes where runway visual range values are assessed by instrumental means shall be equipped with display(s) permitting read-out of the current runway visual range value(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding displays in the aerodrome control tower and in the meteorological station, where such a station exists.

7.1.3.5 Units providing approach control service for final approach, landing and take-off at aerodromes where the height of cloud base is assessed by instrumental means should be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays should be related to the same location(s) of observations and be fed from the same sensor(s) as the corresponding display(s) in the aerodrome control tower and in the meteorological station, where such a station exists.

7.1.3.6 Units providing approach control service for final approach, landing and take-off shall be supplied with information on wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach.

Note – Provisions concerning the issuance of wind shear warnings and alerts and ATS requirements for meteorological information are given in MCAR-3, Chapter 7 and Appendices 6 and 9.

7.1.4 AERODROME CONTROL TOWERS

7.1.4.1 Aerodrome control towers shall be supplied with meteorological information as described MCAR-3, Appendix 9, 1.1 for the aerodrome with which they are concerned. Special reports and amendments to forecasts shall be communicated to the aerodrome control towers as soon as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast.

Note – See Note following 7.1.2.1.

7.1.4.2 Aerodrome control towers shall be provided with current pressure data for setting altimeters for the aerodrome concerned.

7.1.4.3 Aerodrome control towers shall be equipped with surface wind display(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists. Where multiple sensor(s) 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 Aerodrome control towers at aerodromes where runway visual range values are measured by instrumental means shall be equipped with display(s) permitting read-out of the current runway visual range value(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.

7.1.4.5 Aerodrome control towers at aerodromes where the height of cloud base is assessed by instrumental means should be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays should be related to the same location(s) of observations and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.

7.1.4.6 Aerodrome control towers shall be supplied 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 Aerodrome control towers and/or other appropriate units should be supplied with aerodrome warnings.

Note – The meteorological conditions for which aerodrome warnings are issued are listed in MCAR-3, Appendix 6, 5.1.3

7.1.5 COMMUNICATION STATIONS

Where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to communication stations. A copy of such information shall be forwarded to the flight information centre or the area control centre.

7.2 Information on Aerodrome Conditions and the Operational Status of Associated Facilities

Aerodrome control towers and units providing approach control service shall be kept currently informed of the operationally significant conditions of the movement area, including the existence of temporary hazards, and the operational status of any associated facilities at the aerodrome(s) with which they are concerned.

7.3 Information on the Operational Status of Navigation Aids

7.3.1 ATS units shall be kept 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 navigational services and visual aids essential for surface movement.

7.3.2 Information on the operational status, and any changes thereto, of radio navigation services and visual aids as referred to in 7.3.1 shall be received by the ATS unit(s) on a timely basis consistent with the use of the service(s) and aid(s) involved.

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 (Doc 9426). Specifications for monitoring visual aids are contained in MCAR-14, Volume I, and related guidance material is in the Aerodrome Design Manual (Doc 9157), Part 5. Specifications for monitoring non-visual aids are contained in ICAO Annex 10, Volume I.

7.4 Information on Unmanned Free Balloons

Operators of unmanned free balloons shall keep the appropriate air traffic services units informed of details of flights of unmanned free balloons in accordance with the provisions contained in MCAR-2 – Rules of the Air.

7.5 Information Concerning Volcanic Activity

Reserved

7.6 Information Concerning Radioactive Materials and Toxic Chemical "Clouds"

ATS units shall be informed, in accordance with local agreement, of the release into the atmosphere of radioactive materials or toxic chemicals which could affect airspace used by flights within their area of responsibility.

APPENDIX 1. Principles Governing the Identification of Navigation Specification and the Identification of ATS Routes other than Standard Departure and Arrival Routes

(Chapter 2, Sections 2.7 and 2.12 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 (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 of geographical 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 ATS route or within a specified area; and
d) to indicate that a route is used primarily or exclusively by certain types of aircraft.

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 need for 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

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

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 A supplementary letter may be added after the basic designator of the ATS route in question in order to indicate the type of service provided in accordance with the following:

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 is provided.

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 MCAR-4 and MCAR-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.

Note – This is of particular importance where automated ATS data processing and computerized airborne navigation equipment is used.

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 Maldivian requirements for designators shall be notified to the Regional Office 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 above are used, the flight crew should not be required to use them in voice communications.

APPENDIX 2 – Principles Governing the Establishment and Identification of Significant Points

(Chapter 2, Section 2.14 refers)

1. Establishment of Significant Points

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

1.2 Where such ground-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 speaking in 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 aid marking it.

2.2 Composition of coded designators for significant points marked by the site of a 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 1 100 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 are situated at the same location, their radio identifications are normally the same.

2.3 Maldivian requirements for coded designators shall be notified to the Regional Office 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, the significant point shall be designated by a unique five letter pronounce-able "name-code". This name-code designator then serves as the name as well as the coded designator of the significant point.

3.2 This 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 name-code designator assigned to a significant point shall not be assigned to any other significant point.

3.5 Maldivian requirements for name-code designators shall be notified to the Regional Office 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

Note – 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 radio navigation 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.

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

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

4.5 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.

4.6 Where the letters "F", "G", "Y" or "Z" specified in

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 air traffic services 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 position reports 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 expressed in whole degrees may be established.

APPENDIX 3 – Principles Governing the Identification of Standard Departure and Arrival Routes and Associated Procedures

(See Chapter 2, 2.12.3)

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

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 associated procedures".

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 need for fundamental changes.

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

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 BRECON ONE designator: 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 coded designator) signifies either that the original version of the route is still in effect or that a change has been made from the previous version NINE (9) to the now effective version ONE (1) (see 4.3). The absence of 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 KODAP TWO ALPHA designator: 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 several routes 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 ADOLA FIVE BRAVO designator 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 ASC 139-5, Chapter 5, 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 MLS HAPPY ONE ALPHA designator: 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, or are 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 250 kt IAS below 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)	251 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	252 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	Traffic information as far as practical	253 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	254 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	255 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
G	IFR	Nil	Flight information service	256 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	257 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 - Aeronautical Data Quality Requirements

Table 1. Latitude and Longitude

Latitude and Longitude	*Accuracy Data type*	*Integrity Classification*
Flight information region boundary points	2 km declared	routine
P, R, D area boundary points (outside CTA/CTR boundaries)	2 km declared	routine
P, R, D area boundary points (inside CTA/CTR boundaries)	100 m calculated	essential
CTA/CTR boundary points	100 m calculated	essential
En-route navaids and fixes, holding, STAR/SID points	100 m surveyed/calculated	essential
Obstacles in Area 1 (the entire State territory)	50 m surveyed	routine
Obstacles in Area 2 (the part outside the aerodrome/heliport boundary)	5 m surveyed	essential
Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure	3 m surveyed/calculated	essential

Note 1 – See MCAR-15, Appendix 5 for graphical illustrations of the obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Note 2 – In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacles are to be collected in accordance with the Area 1 numerical requirements specified in MCAR-15, Appendix 5, Table A5-2.

Table 2 – Elevation/altitude/height

Elevation/altitude/height	*Accuracy Data type*	*Integrity Classification*
Threshold crossing height (Reference datum height), precision approaches	0.5 m calculated	critical
Obstacle clearance altitude/height (OCA/H)	as specified in PANS-OPS (Doc 8168)	essential
Obstacles in Area 1 (the entire State territory), elevations	30 m surveyed	routine
Obstacles in Area 2 (the part outside the aerodrome/heliport boundary)	3 m surveyed	essential
Distance measuring equipment (DME), elevation	30 m (100 ft) surveyed	essential
Instrument approach procedures altitude	as specified in PANS-OPS (Doc 8168)	essential
Minimum altitudes	50 m calculated	routine

Note 1 – See MCAR-15, Appendix 5 for graphical illustrations of the obstacle data collection surfaces and criteria used to identify obstacles in the defined areas.

Note 2 – In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacles are to be collected in accordance with the Area 1 numerical requirements specified in MCAR-15, Appendix 5, Table A5-2.

Table 3 – Declination and magnetic variation

Declination/variation	*Accuracy Data type*	*Integrity Classification*
VHF NAVAID station declination used for technical line-up	1 degree surveyed	essential
NDB NAVAID magnetic variation	1 degree surveyed	routine

Table 4 – Bearing

Elevation/altitude/height	*Accuracy Data type*	*Integrity Classification*
Airway segments	1/10 degree calculated	routine
Bearing used for the formation of an en-route and of a terminal fix	1/10 degree calculated	routine
Terminal arrival/departure route segments	1/10 degree calculated	routine
Bearing used for the formation of an instrument approach procedure fix	1/100 degree calculated	essential

Table 5 – Length/distance/dimension

Length/distance/dimension	*Accuracy Data type*	*Integrity Classification*
Airway segments length	1/10 km calculated	routine
Distance used for the formation of an en-route fix	1/10 km calculated	routine
Terminal arrival/departure route segments length	1/100 km calculated	essential
Distance used for the formation of a terminal and instrument approach procedure fix	1/100 km calculated	essential

ATTACHMENT A – Material Relating to a Method of Establishing ATS Routes Defined by VOR

(Paragraph 2.7.1 and Section 2.12 refer)

1. Introduction

1.1 The guidance material in this Attachment results from comprehensive studies, carried out in Europe in 1972 and the United States in 1978, which were in general agreement.

Note – Details of the European studies are contained in Circular 120 — Methodology for the Derivation of Separation Minima Applied to the Spacing between Parallel Tracks in ATS Route Structures.

1.1.2 In applying the guidance material in 3 and 4, it should be recognized that the data on which it is based are generally representative of navigation using VOR meeting the full requirements of Doc 8071 — *Manual on Testing of Radio Navigation Aids*, Volume I. Any additional factors, such as those due to particular operational requirements, frequency of aircraft passings or information available regarding the actual track-keeping performance of aircraft within a given portion of airspace should be taken into account.

1.1.3 Attention is also invited to the basic assumptions in 4.2 and to the fact that the values given in 4.1 represent a conservative approach. Before applying these values, account should therefore be taken of any practical experience gained in the airspace under consideration, as well as the possibility of achieving improvements in the overall navigation performance of aircraft.

1.41 ICAO shall be fully informed of the results of the application of this guidance material.

2. Determination of VOR System Performance Values

The large variability of the values which are likely to be associated with each of the factors that make up the total VOR system, and the limitation of presently available methods to measure all these effects individually with the required precision, have led to the conclusion that an assessment of the total system error provides a more realistic method for determining the VOR system performance. The material contained in 3 and 4 should be applied only after study of Circular 120 especially with respect to the environmental conditions.

Note – Guidance material on overall VOR system accuracy is also contained in ICAO Annex 10, Volume I, and Attachment C.

3. Determination of Protected Airspace along VOR-Defined Routes

Note 1 – The material of this section has not been derived by means of the collision-risk/target level of safety method.

Note 2 – The word "containment" as used in this section is intended to indicate that the protected airspace provided will contain the traffic for 95 per cent of the total flying time (i.e.

accumulated over all aircraft) for which the traffic operates along the route in question. Where, for example 95 per cent containment is provided, it is implicit that for 5 per cent of the total flying time traffic will be outside *the protected airspace. It is not possible to quantify the maximum distance which such traffic is likely to deviate beyond the protected airspace.*

3.1 For VOR-defined routes where radar or ADS-B is not used to assist aircraft in remaining within the protected airspace, the following guidance is provided. However, when the lateral deviations of aircraft are being controlled with the aid of radar or ADS-B monitoring, the size of the protected airspace required may be reduced, as indicated by practical experience gained in the airspace under consideration.

3.2 As a minimum, protection against activity in airspace adjacent to the routes should provide 95 per cent containment.

3.3 The work described in Circular 120 indicates that a VOR system performance based on the probability of 95 per cent containment would require the following protected airspace around the centre line of the route to allow for possible deviations:

- VOR routes with 93 km (50 NM) or less between VORs: ±7.4 km (4 NM);
- VOR routes with up to 278 km (150 NM) between VORs: ±7.4 km (4 NM) up to 46 km (25 NM) from the VOR then expanding protected airspace up to ±11.1 km (6 NM) at 139 km (75 NM) from the VOR.

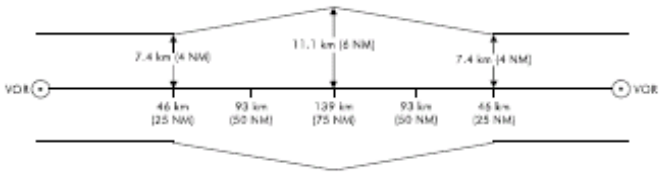

Figure A-1

3.4 For delineating the protected airspace the following values should be used:

- for segments with 93 km (50 NM) or less between VORs, use the values in line A of the table below;
- for segments with more than 93 km (50 NM) and less than 278 km (150 NM) between the VORs use the values given in line A of the table up to 46 km (25 NM), then expand linearly to the value given in line B at 139 km (75 NM) from the VOR.

	Percentage containment					
	95	96	97	98	99	99.5
A (km)	±7.4	±7.4	±8.3	±9.3	±10.2	±11.1
(NM)	±4.0	±4.0	±4.5	±5.0	±5.5	±6.0
B (km)	±11.1	±11.1	±12.0	±12.0	±13.0	±15.7
(NM)	±6.0	±6.0	±6.5	±6.5	±7.0	±8.5

For example, the protected area for a route of 222 km (120 NM) between VORs and for which 99.5 per cent containment is required should have the following shape:

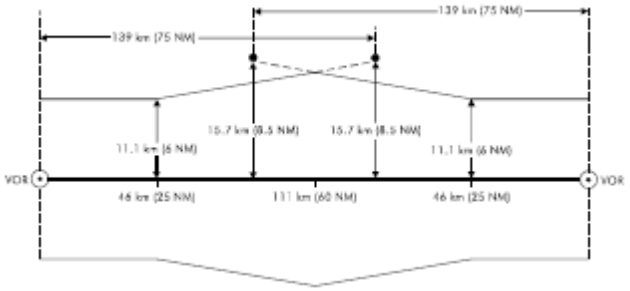

Figure A-2

3.5 If two segments of a VOR-defined ATS route intersect at an angle of more than 25 degrees, additional protected airspace should be provided on the outside of the turn and also on the inside of the turn as necessary. This additional space is to act as a buffer for increased lateral displacement of aircraft, observed in practice, during changes of direction exceeding 25 degrees. The amount of airspace added varies with the angle of intersection. The greater the angle, the greater the additional airspace to be used. Guidance is provided for protected airspace required at turns of no more than 90 degrees. For the exceptional circumstances which require an ATS route with a turn of more than 90 degrees, States should ensure that adequate protected airspace is provided on both the inside and outside of such turns.

3.6 The following examples have been synthesized from the practices of two States which use templates to facilitate the diagramming of airspace for planning purposes. Design of the turning area templates took into account factors such as aircraft speed, bank angle in turns, probable wind velocity, position errors, pilot delays and an intercept angle of at least 30 degrees to achieve the new track, and provides at least 95 per cent containment.

3.7 A template was used to establish the additional airspace required on the outside of turns to contain aircraft executing turns of 30, 45, 60, 75 and 90 degrees. The simplified figures below represent the outer limits of this airspace with the fairing curves removed to allow easy construction. In each case, the additional airspace is shown for aircraft flying in the direction of the large arrow. Where routes are used in both directions, the same additional airspace should be provided on the other outside boundary.

3.8 Figure A-3 illustrates the application of two segments intersecting at a VOR, at an angle of 60 degrees.

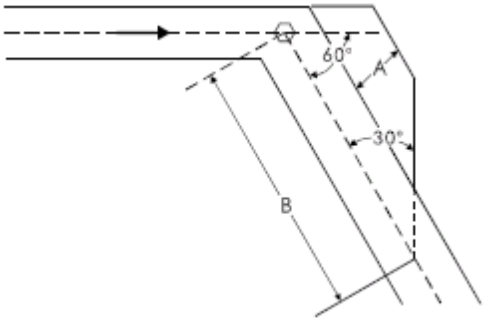

Figure A-3

3.9 Figure A-4 illustrates the application for two segments meeting at a VOR intersection at an angle of 60 degrees beyond the point where boundary splay is required in order to comply with 3.3 and Figure A-1.

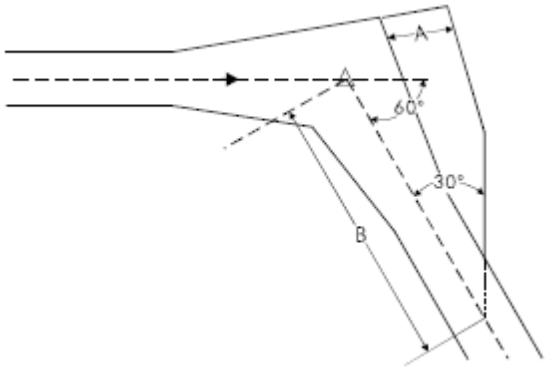

Figure A-4

3.10 The following table outlines the distances to be used in sample cases when providing additional protected airspace for route segments at and below FL 450, intersecting at a VOR or meeting at a VOR intersection not more than 139 km (75 NM) from each VOR.

Note – Refer to Figures A-3 and A-4.

Angle of intersection		*30°*	*45°*	*60°*	*75°*	*90°*
VOR						
*Distance "A"	(km)	5	9	13	17	21
	(NM)	3	5	7	9	11
*Distance "B"	(km)	46	62	73	86	92
	(NM)	25	34	40	46	50
Intersection						
*Distance "A"	(km)	7	11	17	23	29
	(NM)	4	6	9	13	16

*Distance "B"	(km)	66	76	88	103	111
	(NM)	36	41	48	56	60

*Distances are rounded up to the next whole kilometer/nautical mile.

3.11 Figure A-5 illustrates a method to construct the required additional protected airspace on the inside of turns for turns of 90 degrees or less:

Locate a point on the airway centre line, equal to the radius of turn plus the along-track tolerance prior to the nominal turning point.

From this point, drop a perpendicular line to intersect the edge of the airway on the inside of the turn. From this point on the inner edge of the airway, construct a line to intersect the airway centre line beyond the turn at an angle of half of the angle of turn.

The resulting triangle on the inside of the turn depicts the additional airspace which should be protected for the change of direction. For any turn of 90 degrees or less, the extra space on the inside will serve for aircraft approaching the turn from either direction.

Note 1 – Criteria for the calculation of the along-track tolerance are contained in PANS-OPS (Doc 8168), Volume II, Part III, Appendix to Chapter 31.

Note 2 – Guidance on the calculation of radius of turn is provided in Section 7.

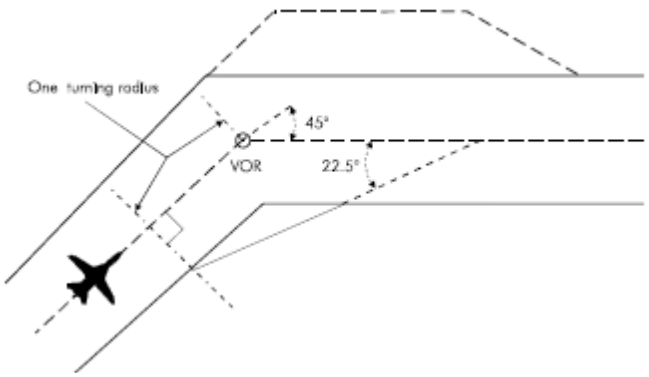

Figure A-5

3.12 For turns at VOR intersections, the principles of construction for extra airspace on the inside of a turn as described in 3.11 can be applied. Depending on the distance of the intersection from one or both VORs, one or both airways may have a splay at the intersection. Depending upon the situation, the extra airspace may be inside, partially inside, or outside of the 95 per cent containment. If the route is used in both directions, the construction should be completed separately for each direction.

3.13 Measured data for routes longer than 278 km (150 NM) between VORs are not yet available. To determine protected airspace beyond 139 km (75 NM) from the VOR, the

use of an angular value of the order of 5 degrees as representing the probable system performance would appear satisfactory. The following figure illustrates this application.

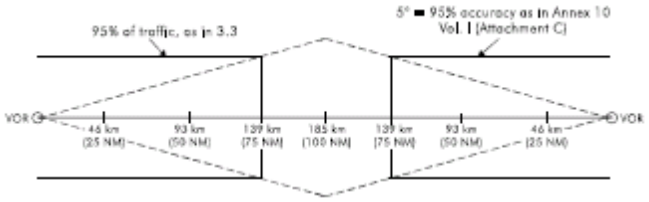

Figure A-6

4. Spacing of Parallel Routes Defined by VORs

Note – The material of this section has been derived from measured data using the collision-risk/target level of safety method.

4.1 The collision risk calculation, performed with the data of the European study mentioned in 1.1 indicates that, in the type of environment investigated, the distance between route centre lines (S in Figure A-7) for distances between VORs of 278 km (150 NM) or less should normally be a minimum of:

a) 33.3 km (18 NM) for parallel routes where the aircraft on the routes fly in opposite direction; and

b) 30.6 km (16.5 NM) for parallel routes where the aircraft on the two routes fly in the same direction.

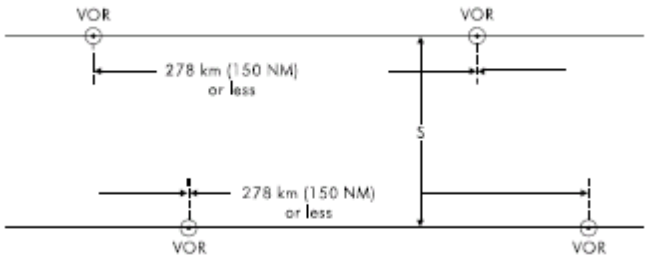

Figure A-7

Note – Two route segments are considered parallel when:

- *they have about the same orientation, i.e. the angular difference does not exceed 10 degrees;*
- *they are not intersecting, i.e. another form of separation must exist at a defined distance from the intersection;*
- *traffic on each route is independent of traffic on the other route, i.e. it does not lead to restrictions on the other route.*

4.2 This spacing of parallel routes assumes:

a) aircraft may either during climb or descent or during level flight be at the same flight levels on the two routes;
b) traffic densities of 25 000 to 50 000 flights per busy two-month period;
c) VOR transmissions which are regularly flight checked in accordance with Doc 8071 - *Manual on Testing of Radio Navigation Aids,* Volume I, and have been found to be satisfactory in accordance with the procedures in that document for navigational purposes on the defined routes; and
d) no real-time radar or ADS-B monitoring or control of the lateral deviations is exercised.

4.3 Preliminary work indicates that, in the circumstances described in a) to c) below, it may be possible to reduce the minimum distance between routes. However, the figures given have not been precisely calculated and in each case a detailed study of the particular circumstances is essential:

a) if the aircraft on adjacent routes are not assigned the same flight levels, the distance between the routes may be reduced; the magnitude of the reduction will depend on the vertical separation between aircraft on the adjacent tracks and on the percentage of climbing and descending traffic, but is not likely to be more than 5.6 km (3 NM);
b) if the traffic characteristics differ significantly from those contained in Circular 120, the minima contained in 4.1 may require adjustment. For example, for traffic densities of about 10 000 flights per busy two-month period a reduction of 900 to 1 850 m (0.5 to 1.0 NM) may be possible;
c) the relative locations of the VORs defining the two tracks and the distance between the VORs will have an effect on the spacing, but this has not been quantified.

4.4 Application of radar or ADS-B monitoring and control of the lateral deviations of the aircraft may have a large effect on the minimum allowable distance between routes. Studies on the effect of radar monitoring indicate that:

- further work is necessary before a fully satisfactory mathematical model can be developed;
- any reduction of separation is closely related to:
- traffic (volume, characteristics);
- coverage and data processing, availability of an automatic alarm;
- monitoring continuity;
- sector workload; and
- radiotelephony quality.

According to these studies and taking into account the experience some States have accumulated over many years with parallel route systems under continuous radar control, it can be expected that a reduction to the order of 15 to 18.5 km (8 to 10 NM), but most probably not less than 13 km (7 NM), may be possible as long as radar monitoring workload is not increased substantially by that reduction. Actual operations of such systems using reduced lateral spacing have shown that:

- it is very important to define and publish change-over points (see also 6);
- large turns should be avoided when possible; and
- where large turns cannot be avoided, required turn profiles should be defined for turns larger than 20 degrees.

Even where the probability of total radar or ADS-B failure is very small, procedures to cover that case should be considered.

5. Spacing of Adjacent VOR-Defined Routes that are not Parallel

Note 1 – The material of this section is intended to provide guidance for situations where non-intersecting VOR-defined routes are adjacent and have an angular difference exceeding 10 degrees.

Note 2 – The material of this section has not been derived by means of the collision-risk/target level of safety method.

5.1 For adjacent non-intersecting VOR-defined routes that are not parallel, the collision-risk/target level of safety method is not, at its present state of development, fully appropriate. For this reason use should be made of the material in 3.

5.2 The protected airspace between such routes should not be less than that which will provide, without overlap, the 99.5 per cent containment values given in the table in 3.4 (see example in Figure A-8).

5.3 Where there is an angular difference of more than 25 degrees between route segments, additional protected airspace, as indicated in 3.5 to 3.10, should be provided.

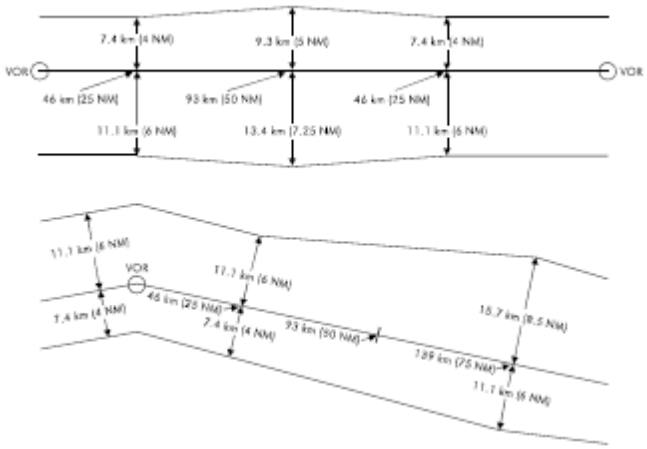

Figure A-8

6. Change-Over Points for VORS

6.1 When considering the establishment of points for changeover from one VOR to another for primary navigational guidance on VOR-defined ATS routes, States should bear in mind that:

a) the establishment of change-over points should be made on the basis of performance of the VOR stations concerned, including an evaluation of the interference protection criteria. The process should be verified by flight checking (see Doc 8071, Volume I, Part II);
b) where frequency protection is critical, flight inspection should be undertaken at the highest altitudes to which the facility is protected.

6.2 Nothing in 6.1 should be interpreted as placing a restriction on the service ranges of VOR installations meeting the specifications in ICAO Annex 10, Volume I, 3.3.

7. Calculation of Radius of Turn

7.1 The method used to calculate turn radii and the turn radii indicated below are applicable to aircraft performing a constant radius turn. The material has been derived from the turn performance criteria developed for RNP 1 ATS routes and can be used in the construction of the required additional protected airspace on the inside of turns also for ATS routes other than those defined by VOR.

7.2 Turn performance is dependent on two parameters – ground speed and bank angle. Due to the effect of the wind component changing with the change of heading, the ground speed and hence bank angle will change during a constant radius turn. However, for turns not greater than approximately 90 degrees and for the speed values considered below, the following formula can be used to calculate the achievable constant radius of turn, where the ground speed is the sum of the true airspeed and the wind speed:

$$\text{Radius of turn} = \frac{(\text{Ground speed})^2}{\text{Constant 'G'} \times \text{Tan (bank angle)}}$$

7.3 The greater the ground speed, the greater will be the required bank angle. To ensure that the turn radius is representative for all foreseeable conditions, it is necessary to consider extreme parameters. A true airspeed of 1 020 km/h (550 kt) is considered probably the greatest to be encountered in the upper levels. Combined with maximum anticipated wind speeds in the medium and upper flight levels of 370 km/h (200 kt) [99.5 per cent values based on meteorological data], a maximum ground speed of 1 400 km/h (750 kt) should be considered. Maximum bank angle is very much a function of individual aircraft. Aircraft with high wing loadings flying at or near their maximum flight level are highly intolerant of extreme angles. Most transport aircraft are certified to fly no slower than 1.3 times their stall speed for any given configuration. Because the stall speed rises with TAN (bank angle), many operators try not to cruise below 1.4 times the stall speed to protect against gusts or turbulence. For the same reason, many transport aircraft fly at reduced maximum angles of bank in cruise conditions. Hence, it can be assumed that the highest bank angle which can be tolerated by all aircraft types is in the order of 20 degrees.

7.4 By calculation, the radius of turn of an aircraft flying at 1 400 km/h (750 kt) ground speed, with a bank angle of 20 degrees, is 22.51 NM (41.69 km). For purposes of expediency, this has been reduced to 22.5 NM (41.6 km). Following the same logic for the lower airspace, it is considered that up to FL 200 (6 100 m) the maximum figures to be

encountered are a true airspeed of 740 km/h (400 kt), with a tailwind of 370 km/h (200 kt). Keeping the maximum bank angle of 20 degrees, and following the same formula, the turn would be defined along a radius of 14.45 NM (26.76 km). For expediency, this figure may be rounded up to 15 NM (27.8 km).

7.5 Given the above, the most logical break point between the two ground speed conditions is between FL 190 (5 800 m) and FL 200 (6 100 m). In order to encompass the range of turn anticipation algorithms used in current flight management systems (FMS) under all foreseeable conditions, the turn radius at FL 200 and above should be defined as 22.5 NM (41.6 km) and at FL 190 and below as 15 NM (27.8 km)

ATTACHMENT B – Traffic Information Broadcasts by Aircraft (TIBA) and Related Operating Procedures

(See Chapter 4, 4.2.2, Note 2)

1. Introduction and Applicability of Broadcasts

1.1 Traffic information broadcasts by aircraft are intended to permit reports and relevant supplementary information of an advisory nature to be transmitted by pilots on a designated VHF radiotelephone (RTF) frequency for the information of pilots of other aircraft in the vicinity.

1.2 TIBAs should be introduced only when necessary and as a temporary measure.

1.3 The broadcast procedures should be applied in designated airspace where:

a) there is a need to supplement collision hazard information provided by air traffic services outside controlled airspace; or
b) there is a temporary disruption of normal air traffic services.

1.4 Such airspaces should be identified by the CAA for provision of air traffic services within these airspaces, if necessary with the assistance of the appropriate ICAO Regional Office(s), and duly promulgated in aeronautical information publications or NOTAM, together with the VHF RTF frequency, the message formats and the procedures to be used. Where, in the case of 1.3 a), more than one State is involved, the airspace should be designated on the basis of regional air navigation agreements and promulgated in Doc 7030.

1.5 Reviewing of the applicability in a designated airspace by the ANSP (s), should be carried out with intervals not exceeding 12 months.

2. Details of Broadcasts

2.1 VHF RTF FREQUENCY TO BE USED

2.1.1 The VHF RTF frequency to be used should be determined and promulgated on a regional basis. However, in the case of temporary disruption occurring in controlled airspace, the States responsible may promulgate, as the VHF RTF frequency to be used within the limits of that airspace, a frequency used normally for the provision of air traffic control service within that airspace.

2.1.2 Where VHF is used for air-ground communications with ATS and an aircraft has only two serviceable VHF sets, one should be tuned to the appropriate ATS frequency and the other to the TIBA frequency.

2.2 LISTENING WATCH

A listening watch should be maintained on the TIBA frequency 10 minutes before entering the designated airspace until leaving this airspace. For an aircraft taking off from

an aerodrome located within the lateral limits of the designated airspace listening watch should start as soon as appropriate after take-off and be maintained until leaving the airspace.

2.3 TIME OF BROADCASTS

A broadcast should be made:

a) 10 minutes before entering the designated airspace or, for a pilot taking off from an aerodrome located within the lateral limits of the designated airspace, as soon as appropriate after take-off;
b) 10 minutes prior to crossing a reporting point;
c) 10 minutes prior to crossing or joining an ATS route;
d) at 20-minute intervals between distant reporting points;
e) 2 to 5 minutes, where possible, before a change in flight level;
f) at the time of a change in flight level; and
g) at any other time considered necessary by the pilot.

2.4 FORMS OF BROADCAST

2.4.1 The broadcasts other than those indicating changes in flight level, i.e. the broadcasts referred to in 2.3 a), b), c), d) and g), should be in the following form:

ALL STATIONS (necessary to identify a traffic information broadcast)

(call sign)

FLIGHT LEVEL (number) (or CLIMBING* TO FLIGHT LEVEL (number))

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

POSITION (position**) AT (time)

ESTIMATING (next reporting point, or the point of crossing or joining a designated ATS route) AT (time)

(call sign)

FLIGHT LEVEL (number)

(direction)

Fictitious example:

"ALL STATIONS WINDAR 671 FLIGHT LEVEL 350 NORTHWEST BOUND DIRECT FROM PUNTA SAGA TO PAMPA POSITION 5040 SOUTH 2010 EAST AT 2358

ESTIMATING CROSSING ROUTE LIMA THREE ONE AT 4930 SOUTH 1920 EAST AT 0012 WINDAR 671 FLIGHT LEVEL 350 NORTHWEST BOUND OUT"

2.4.2 Before a change in flight level, the broadcast (referred to in 2.3 e)) should be in the following form:

ALL STATIONS

(call sign)

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

LEAVING FLIGHT LEVEL (number) FOR FLIGHT LEVEL (number) AT (position and time)

2.4.3 Except as provided in 2.4.4, the broadcast at the time of a change in flight level (referred to in 2.3 f)) should be in the following form:

ALL STATIONS

(call sign)

(direction)

(ATS route) (or DIRECT FROM (position) TO (position))

LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number) followed by:

ALL STATIONS

(call sign)

MAINTAINING FLIGHT LEVEL (number)

2.4.3 Broadcasts reporting a temporary flight level change to avoid an imminent collision risk should be in the following form:

ALL STATIONS

(call sign)

LEAVING FLIGHT LEVEL (number) NOW FOR FLIGHT LEVEL (number) followed as soon as practicable by:

ALL STATIONS

(call sign)

RETURNING TO FLIGHT LEVEL (number) NOW

2.5 ACKNOWLEDGEMENT OF BROADCASTS

The broadcasts should not be acknowledged unless a potential collision risk is perceived.

3. Related Operating Procedures

3.1 CHANGES OF CRUISING LEVEL

3.1.1 Cruising level changes should not be made within the designated airspace, unless considered necessary by pilots to avoid traffic conflicts, for weather avoidance or for other valid operational reasons.

* For the broadcast referred to in 2.3 a) in the case of an aircraft taking off from an aerodrome located within the lateral limits of the designated airspace.

** For broadcasts made when the aircraft is not near an ATS significant point, the position should be given as accurately as possible and in any case to the nearest 30 minutes of latitude and longitude.

3.1.2 When cruising level changes are unavoidable, all available aircraft lighting which would improve the visual detection of the aircraft should be displayed while changing levels.

3.2 COLLISION AVOIDANCE

If, on receipt of traffic information broadcast from another aircraft, a pilot decides that immediate action is necessary to avoid an imminent collision risk, and this cannot be achieved in accordance with the right-of-way provisions of MCAR-2, the pilot should:

a) unless an alternative manoeuvre appears more appropriate, immediately descend 150 m (500 ft), or 300 m (1 000 ft) if above FL 290 in an area where a vertical separation minimum of 600 m (2 000 ft) is applied;
b) display all available aircraft lighting which would improve the visual detection of the aircraft;
c) as soon as possible, reply to the broadcast advising action being taken;
d) notify the action taken on the appropriate ATS frequency; and
e) as soon as practicable, resume normal flight level, notifying the action on the appropriate ATS frequency.

3.3 NORMAL POSITION REPORTING PROCEDURES

Normal position reporting procedures should be continued at all times, regardless of any action taken to initiate or acknowledge a traffic information broadcast.

ATTACHMENT C – Material Relating to Contingency Planning

(see 2.30)

1. Introduction

Contingency plans are intended to provide alternative facilities and services to those provided for in the regional air navigation plan when those facilities and services are temporarily not available. Contingency arrangements are therefore temporary in nature, remain in effect only until the services and facilities of the regional air navigation plan are reactivated and, accordingly, do not constitute amendments to the regional plan requiring processing in accordance with the "Procedure for the Amendment of Approved Regional Plans". Instead, in cases where the contingency plan would temporarily deviate from the approved regional air navigation plan, such deviations are approved, as necessary, by the President of the ICAO Council on behalf of the Council

2. Responsibility for Developing, Promulgating and Implementing Contingency Plans

2.1 For disruption or potential disruption of air traffic services and related supporting services instituting measures to ensure the safety of international civil aviation operations and, where possible, for making provisions for alternative facilities and services should be in place. To that end the ANSP should develop, promulgate and implement appropriate contingency plans. Such plans should be developed in consultation with other States and airspace users concerned and with ICAO, as appropriate, whenever the effects of the service disruption(s) are likely to affect the services in adjacent airspace.

2.2 The responsibility for appropriate contingency action in respect of airspace over the high seas continues to rest with the Male' ACC unless, that responsibility is temporarily reassigned by ICAO to (an) other State(s).

3. Preparatory Action

3.1 Time is essential in contingency planning if hazards to air navigation are to be reasonably prevented. Timely introduction of contingency arrangements requires decisive initiative and action, which again presupposes that contingency plans have, as far as practicable, been completed and agreed among the parties concerned before the occurrence of the event requiring contingency action, including the manner and timing of promulgating such arrangements.

3.2 For the reasons given in 4.1, following preparatory actions should be taken for facilitating timely introduction of contingency arrangements;

a) preparation of general contingency plans for introduction in respect of generally foreseeable events affecting the provision of air traffic services and/or supporting services
b) assessment of risk to civil air traffic due to military conflict or acts of unlawful interference with civil aviation as well as a review of the likelihood and possible consequences of natural disasters. Preparatory action should include initial

development of special contingency plans in respect of natural disasters, military conflicts or acts of unlawful interference with civil aviation that are likely to affect the availability of airspace for civil aircraft operations and/or the provision of air traffic services and supporting services. It should be recognized that avoidance of particular portions of airspace on short notice will require special efforts by States responsible for adjacent portions of airspace and by international aircraft operators with regard to planning of alternative routings and services, and the air traffic services authorities should therefore, as far as practicable, endeavour to anticipate the need for such alternative actions;

c) monitoring of any developments that might lead to events requiring contingency arrangements to be developed and applied. States should consider designating persons/ administrative units to undertake such monitoring and, when necessary, to initiate effective follow-up action; and

d) designation/establishment of a central agency which, in the event of disruption of air traffic services and introduction of contingency arrangements, would be able to provide, 24 hours a day, up-to-date information on the situation and associated contingency measures until the system has returned to normal. A coordinating team should be designated within, or in association with, such a central agency for the purpose of coordinating activities during the disruption.

3.3 ICAO will be available for monitoring developments that might lead to events requiring contingency arrangements to be developed and applied and will, as necessary, assist in the development and application of such arrangements. During the emergence of a potential crisis, a coordinating team will be established in the Regional Office(s) concerned and at ICAO Headquarters in Montreal, and arrangements will be made for competent staff to be available or reachable 24 hours a day. The tasks of these teams will be to monitor continuously information from all relevant sources, to arrange for the constant supply of relevant information received by the State aeronautical information service at the location of the Regional Office and Headquarters, to liaise with international organizations concerned and their regional organizations, as appropriate, and to exchange up-to-date information with States directly concerned and States which are potential participants in contingency arrangements. Upon analysis of all available data, authority for initiating the action considered necessary in the circumstances will be obtained from the State(s) concerned.

4. Coordination

4.1 A contingency plan should be acceptable to providers and users of contingency services alike, i.e. in terms of the ability of the providers to discharge the functions assigned to them and in terms of safety of operations and traffic handling capacity provided by the plan in the circumstances.

4.2 Accordingly, when anticipating or experiencing disruption of air traffic services and/or related supporting services, the CAA should advise, as early as practicable, the ICAO APAC Regional Office, and other States whose services might be affected. Such advice should include information on associated contingency measures or a request for assistance in formulating contingency plans.

4.3 In the case of contingency arrangements not appreciably affecting airspace users or service provided outside the airspace of the (single) State involved, coordination requirements are naturally few or non-existent. Such cases are believed to be few.

4.4 In the case of multi-State ventures, detailed coordination leading to formal agreement of the emerging contingency plan should be undertaken with each State which is to participate. Such detailed coordination should also be undertaken with those States whose services will be significantly affected, for example by re-routing of traffic, and with international organizations concerned who provide invaluable operational insight and experience.

4.5 Whenever necessary to ensure orderly transition to contingency arrangements, the coordination referred to in this section should include agreement on a detailed, common NOTAM text to be promulgated at a commonly agreed effective date.

5. Development, Promulgation and Application of Contingency Plans

5.1 Development of a sound contingency plan is dependent upon circumstances, including the availability, or not, of the airspace affected by the disruptive circumstances for use by international civil aviation operations.

5.2 Development of a contingency plan presupposes as much information as possible on:

a) current and alternative routes;
b) navigational capability of aircraft;
c) availability or partial availability of navigational guidance from ground-based aids;
d) surveillance and communications capability of adjacent air traffic services units;
e) volume and types of aircraft to be accommodated;
f) the actual status of the air traffic services, communications, meteorological and aeronautical information services.

5.3 Following are the main elements to be considered for contingency planning depending upon circumstances:

a) re-routing of traffic to avoid the whole or part of the airspace concerned, normally involving establishment of additional routes or route segments with associated conditions for their use;
b) establishment of a simplified route network through the airspace concerned, if it is available, together with a flight level allocation scheme to ensure lateral and vertical separation, and a procedure for adjacent area control centres to establish longitudinal separation at the entry point and to maintain such separation through the airspace;
c) reassignment of responsibility for providing air traffic services in airspace over the high seas or in delegated airspace;
d) provision and operation of adequate air-ground communications, AFTN and ATS direct speech links, including reassignment, to adjacent States, of the responsibility for providing meteorological information and information on status of navigation aids;
e) special arrangements for collecting and disseminating in-flight and post-flight reports from aircraft;

f) a requirement for aircraft to maintain continuous listening watch on a specified pilot-pilot VHF frequency in specified areas where air-ground communications are uncertain or non-existent and to broadcast on that frequency, preferably in English, position information and estimates, including start and completion of climb and descent;
g) a requirement for all aircraft in specified areas to display navigation and anti-collision lights at all times;
h) a requirement and procedures for aircraft to maintain an increased longitudinal separation that may be established between aircraft at the same cruising level;
i) a requirement for climbing and descending well to the right of the centre line of specifically identified routes;
j) establishment of arrangements for controlled access to the contingency area to prevent overloading of the contingency system; and
k) a requirement for all operations in the contingency area to be conducted in accordance with IFR, including allocation of IFR flight levels, from the relevant Table of Cruising Levels in Appendix 3 of MCAR-2, to ATS routes in the area.

5.4 Notification, by NOTAM, of anticipated or actual disruption of air traffic services and/or related supporting services should be dispatched to users of air navigation services as early as practicable. The NOTAM should include the associated contingency arrangements. In the case of foreseeable disruption, the advance notice should in any case not be less than 48 hours.

5.5 Notification by NOTAM of discontinuance of contingency measures and reactivation of the services set forth in the regional air navigation plan should be dispatched as early as practicable to ensure an orderly transfer from contingency conditions to normal conditions.