



Maldives Civil Aviation Authority
Republic of Maldives

Maldivian Civil Aviation Regulations

MCAR- I I Air Traffic Services

Issue 3.00, 15 Feb 2023

Foreword

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

This Regulation shall be cited as MCAR-11 Air Traffic Services and shall come into force on **15th February 2023**. Existing aviation requirements as listed in "MCAR-11 Air Traffic Services" dated 16 November 2015 will be repealed as from **15th February 2023**.

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

[illegible]

List of Effective Pages

Chapter	Part	Page	Amendment	Date
	Foreword	ii	Issue: 3.00	15 Feb 2023
	List of Amendments	iii	Issue: 3.00	15 Feb 2023
	List of Effective Pages	iv-v	Issue: 3.00	15 Feb 2023
	Table of Contents	vi-x	Issue: 3.00	15 Feb 2023
1	Definition	11	Issue: 3.00	15 Feb 2023
2	General	12-29	Issue: 3.00	15 Feb 2023
3	Air Traffic Control Service	30-39	Issue: 3.00	15 Feb 2023
4	Flight Information Service	40-49	Issue: 3.00	15 Feb 2023
5	Alerting Service	50-53	Issue: 3.00	15 Feb 2023
6	Air traffic services requirements for communications	54-58	Issue: 3.00	15 Feb 2023
7	Air traffic services requirements for information	59-62	Issue: 3.00	15 Feb 2023
Appendix 1	Principles governing the identification of navigation specifications and the identification of ats routes other than standard departure and arrival routes	63-65	Issue: 3.00	15 Feb 2023
Appendix 2	Principles governing the establishment and identification of significant points	66-69	Issue: 3.00	15 Feb 2023

Chapter	Part	Page	Amendment	Date
Appendix 3	Principles governing the identification of standard departure and arrival routes and associated procedures	70-74	Issue: 3.00	15 Feb 2023
Appendix 4	ATS Airspace Classes — Services Provided and Flight Requirements	75	Issue: 3.00	15 Feb 2023
Appendix 5	Prescriptive Fatigue Management Regulation	76-78	Issue: 3.00	15 Feb 2023
Appendix 6	Fatigue Risk Management System (FRMS) Requirement	79-82	Issue: 3.00	15 Feb 2023
Appendix 7	State Responsibilities Concerning an Instrument Flight Procedure Design service	83	Issue: 3.00	15 Feb 2023
Attachment A	Material relating to a method of establishing ATS routes defined by VOR	84-93	Issue: 3.00	15 Feb 2023
Attachment B	Traffic information broadcasts by aircraft (TIBA) and related operating procedures	94-97	Issue: 3.00	15 Feb 2023
Attachment C	Material relating to contingency planning	98-100	Issue: 3.00	15 Feb 2023

Table of Contents

Foreword	ii
List of Amendments	iii
List of Effective Pages	iv
Table of Contents	vi

CHAPTER 1 - DEFINITIONS -----11

CHAPTER 2 - GENERAL -----12

2.1	THE AUTHORITY TO PROVIDE AIR TRAFFIC SERVICES -----	12
2.2	OBJECTIVES OF THE AIR TRAFFIC SERVICES -----	12
2.3	DIVISIONS OF THE AIR TRAFFIC SERVICES -----	12
2.4	DETERMINATION OF THE NEED FOR AIR TRAFFIC SERVICES -----	13
2.5	DESIGNATION OF THE PORTIONS OF THE AIRSPACE AND CONTROLLED AERODROMES WHERE AIR TRAFFIC SERVICES WILL BE PROVIDED -----	13
2.6	CLASSIFICATION OF AIRSPACES -----	14
2.7	PERFORMANCE-BASED NAVIGATION (PBN) OPERATIONS -----	14
2.8	PERFORMANCE-BASED COMMUNICATION (PBC) OPERATIONS -----	15
2.9	PERFORMANCE-BASED SURVEILLANCE (PBS) OPERATIONS -----	15
2.10	ESTABLISHMENT AND DESIGNATION OF THE UNITS PROVIDING AIR TRAFFIC SERVICES -----	15
2.11	SPECIFICATIONS FOR FLIGHT INFORMATION REGIONS, CONTROL AREAS AND CONTROL ZONES -----	16
2.12	IDENTIFICATION OF AIR TRAFFIC SERVICES UNITS AND AIRSPACES -----	17
2.13	ESTABLISHMENT AND IDENTIFICATION OF ATS ROUTES -----	17
2.14	ESTABLISHMENT OF CHANGE-OVER POINTS -----	18
2.15	ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS -----	18
2.16	ESTABLISHMENT AND IDENTIFICATION OF STANDARD ROUTES FOR TAXIING AIRCRAFT -----	18
2.17	COORDINATION BETWEEN THE OPERATOR AND AIR TRAFFIC SERVICES -----	18
2.18	COORDINATION BETWEEN MILITARY AUTHORITIES AND AIR TRAFFIC SERVICES	19
2.19	COORDINATION OF ACTIVITIES POTENTIALLY HAZARDOUS TO CIVIL AIRCRAFT -	19
2.20	AERONAUTICAL DATA -----	20
2.21	COORDINATION BETWEEN METEOROLOGICAL AND AIR TRAFFIC SERVICES AUTHORITIES -----	21
2.22	COORDINATION BETWEEN AERONAUTICAL INFORMATION SERVICES AND AIR TRAFFIC SERVICES AUTHORITIES -----	21
2.23	MINIMUM FLIGHT ALTITUDES -----	22
2.24	SERVICE TO AIRCRAFT IN THE EVENT OF AN EMERGENCY -----	22
2.25	IN-FLIGHT CONTINGENCIES -----	23

2.26	TIME IN AIR TRAFFIC SERVICES-----	25
2.27	REQUIREMENTS FOR CARRIAGE AND OPERATION OF PRESSURE-ALTITUDE REPORTING TRANSPONDERS -----	25
2.28	FATIGUE MANAGEMENT -----	26
2.29	SAFETY MANAGEMENT -----	27
2.30	COMMON REFERENCE SYSTEMS -----	27
2.31	LANGUAGE PROFICIENCY-----	28
2.32	CONTINGENCY ARRANGEMENTS -----	28
2.33	IDENTIFICATION AND DELINEATION OF PROHIBITED, RESTRICTED AND DANGER AREAS-----	28
2.34	INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE -----	29
CHAPTER 3 -	AIR TRAFFIC CONTROL SERVICE -----	30
3.1	APPLICATION -----	30
3.2	PROVISION OF AIR TRAFFIC CONTROL SERVICE -----	30
3.3	OPERATION OF AIR TRAFFIC CONTROL SERVICE -----	30
3.4	SEPARATION MINIMA -----	32
3.5	RESPONSIBILITY FOR CONTROL -----	33
3.6	TRANSFER OF RESPONSIBILITY FOR CONTROL -----	33
3.7	AIR TRAFFIC CONTROL CLEARANCES -----	35
3.8	CONTROL OF PERSONS AND VEHICLES AT AERODROMES-----	38
3.9	PROVISION OF RADAR AND ADS-B-----	38
3.10	USE OF SURFACE MOVEMENT RADAR (SMR)-----	39
CHAPTER 4 -	FLIGHT INFORMATION SERVICE -----	40
4.1	APPLICATION -----	40
4.2	SCOPE OF FLIGHT INFORMATION SERVICE -----	40
4.3	OPERATIONAL FLIGHT INFORMATION SERVICE BROADCASTS -----	41
4.4	VOLMET BROADCASTS AND D-VOLMET SERVICE-----	49
CHAPTER 5 -	ALERTING SERVICE -----	50
5.1	APPLICATION -----	50
5.2	NOTIFICATION OF RESCUE COORDINATION CENTRES -----	50
5.3	USE OF COMMUNICATION FACILITIES -----	52
5.4	PLOTTING AIRCRAFT IN A STATE OF EMERGENCY -----	52
5.5	INFORMATION TO THE OPERATOR-----	52
5.6	INFORMATION TO AIRCRAFT OPERATING IN THE VICINITY OF AN AIRCRAFT IN A STATE OF EMERGENCY -----	52
CHAPTER 6 -	AIR TRAFFIC SERVICES REQUIREMENTS FOR COMMUNICATIONS-----	54

6.1	AERONAUTICAL MOBILE SERVICE (AIR-GROUND COMMUNICATIONS)-----	54
6.2	AERONAUTICAL FIXED SERVICE (GROUND-GROUND COMMUNICATIONS) -----	55
6.3	SURFACE MOVEMENT CONTROL SERVICE -----	58
6.4	AERONAUTICAL RADIO NAVIGATION SERVICE -----	58
CHAPTER 7 -	AIR TRAFFIC SERVICES REQUIREMENTS FOR INFORMATION-----	59
7.1	METEOROLOGICAL INFORMATION-----	59
7.2	INFORMATION ON AERODROME CONDITIONS AND THE OPERATIONAL STATUS OF ASSOCIATED FACILITIES -----	61
7.3	INFORMATION ON THE OPERATIONAL STATUS OF NAVIGATION AIDS-----	61
7.4	INFORMATION ON UNMANNED FREE BALLOONS-----	61
7.5	INFORMATION CONCERNING VOLCANIC ACTIVITY-----	62
7.6	INFORMATION CONCERNING RADIOACTIVE MATERIALS AND TOXIC CHEMICAL "CLOUDS"-----	62
Appendix 1	PRINCIPLES GOVERNING THE IDENTIFICATION OF NAVIGATION SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES	63
1.	DESIGNATORS FOR ATS ROUTES AND NAVIGATION SPECIFICATIONS-----	63
2.	COMPOSITION OF DESIGNATOR-----	63
3.	ASSIGNMENT OF BASIC DESIGNATORS-----	64
4.	USE OF DESIGNATORS IN COMMUNICATIONS-----	65
Appendix 2	PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS	66
1.	ESTABLISHMENT OF SIGNIFICANT POINTS -----	66
2.	DESIGNATORS FOR SIGNIFICANT POINTS MARKED BY THE SITE OF A RADIO NAVIGATION AID -----	66
3.	DESIGNATORS FOR SIGNIFICANT POINTS NOT MARKED BY THE SITE OF A RADIO NAVIGATION AID -----	67
4.	USE OF DESIGNATORS IN COMMUNICATIONS-----	68
5.	SIGNIFICANT POINTS USED FOR REPORTING PURPOSES -----	68
Appendix 3	PRINCIPLES GOVERNING THE IDENTIFICATION OF STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES	70
1.	DESIGNATORS FOR STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES -----	70
2.	COMPOSITION OF DESIGNATORS -----	70
3.	ASSIGNMENT OF DESIGNATORS -----	71
4.	ASSIGNMENT OF VALIDITY INDICATORS -----	71

5.	EXAMPLES OF PLAIN LANGUAGE AND CODED DESIGNATORS -----	71
6.	COMPOSITION OF DESIGNATORS FOR MLS/RNAV APPROACH PROCEDURES ----	72
7.	USE OF DESIGNATORS IN COMMUNICATIONS-----	73
8.	DISPLAY OF ROUTES AND PROCEDURES TO AIR TRAFFIC CONTROL -----	74
Appendix 4	ATS AIRSPACE CLASSES — SERVICES PROVIDED AND FLIGHT REQUIREMENTS	75
Appendix 5	PRESCRIPTIVE FATIGUE MANAGEMENT REGULATIONS	76
1.	DEFINITIONS -----	76
2.	THE AIR TRAFFIC SERVICES PROVIDER'S RESPONSIBILITY -----	76
3.	AIR TRAFFIC CONTROLLERS' RESPONSIBILITIES-----	77
4.	PRESCRIPTIVE LIMITATION PARAMETERS FOR AIR TRAFFIC CONTROLLERS -----	77
Appendix 6	FATIGUE RISK MANAGEMENT SYSTEM (FRMS) REQUIREMENTS	79
1.	FRMS POLICY AND DOCUMENTATION-----	79
2.	FATIGUE RISK MANAGEMENT PROCESSES-----	80
3.	FRMS SAFETY ASSURANCE PROCESSES-----	81
4.	FRMS PROMOTION PROCESSES-----	82
Appendix 7	STATE RESPONSIBILITIES CONCERNING AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE	83
ATTACHMENT A - MATERIAL RELATING TO A METHOD OF ESTABLISHING ATS ROUTES DEFINED BY VOR	-----	84
1.	INTRODUCTION -----	84
2.	DETERMINATION OF VOR SYSTEM PERFORMANCE VALUES-----	84
3.	DETERMINATION OF PROTECTED AIRSPACE ALONG VOR-DEFINED ROUTES ----	84
4.	SPACING OF PARALLEL ROUTES DEFINED BY VORS -----	89
5.	SPACING OF ADJACENT VOR-DEFINED ROUTES THAT ARE NOT PARALLEL -----	91
6.	CHANGE-OVER POINTS FOR VORS -----	92
7.	CALCULATION OF RADIUS OF TURN -----	92
ATTACHMENT B - TRAFFIC INFORMATION BROADCASTS BY AIRCRAFT (TIBA) AND RELATED OPERATING PROCEDURES	-----	94
1.	INTRODUCTION AND APPLICABILITY OF BROADCASTS-----	94
2.	DETAILS OF BROADCASTS-----	94
3.	RELATED OPERATING PROCEDURES-----	96
ATTACHMENT C - MATERIAL RELATING TO CONTINGENCY PLANNING	-----	98
1.	STATUS OF CONTINGENCY PLANS -----	98

2.	RESPONSIBILITY FOR DEVELOPING, PROMULGATING, AND IMPLEMENTING CONTINGENCY PLANS -----	98
3.	PREPARATORY ACTION -----	98
4.	COORDINATION -----	99
5.	DEVELOPMENT, PROMULGATION AND APPLICATION OF CONTINGENCY PLANS 100	

CHAPTER 1 - DEFINITIONS

(RESERVED)

CHAPTER 2 - GENERAL

2.1 THE AUTHORITY TO PROVIDE AIR TRAFFIC SERVICES

- 2.1.1 The entity/entities stated in 2.1.3 shall provide Air Traffic Services in the defined airspace that has been allocated to the Maldives by ICAO under the Chicago Convention and for which Maldives has accepted responsibilities, including all the aerodromes, 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 Maldives Civil Aviation Authority.
- 2.1.2 Those portions of the airspace over the high seas or in airspace of undetermined sovereignty where air traffic services will be provided shall be determined on the basis of regional air navigation agreements.
- 2.1.3
- a) Maldives Airports Company Limited is the designated responsible entity for provision of Air Traffic Services in Maldives.
 - b) No other agency shall provide an air traffic service unless approved by the CAA.
- 2.1.4 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 requirement for aircraft to carry Airborne Collision Avoidance Systems (ACAS) whilst flying in a given area shall not be considered as a factor in determining the need for air traffic services in that area.

2.5 DESIGNATION OF THE PORTIONS OF THE AIRSPACE AND CONTROLLED AERODROMES WHERE AIR TRAFFIC SERVICES WILL BE PROVIDED

2.5.1 When it has been determined that air traffic services will be provided in particular portions of the airspace or at particular aerodromes, those portions of the airspace or those aerodromes shall be designated in relation to the air traffic services that are to be provided.

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

2.5.2.1 *Flight information regions.* Those portions of the airspace where it is determined that flight information service and alerting service will be provided shall be designated as flight information regions.

2.5.2.2 *Control areas and control zones*

- (i) 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.

Note. — The distinction between control areas and control zones is made in 2.11.

- (ii) 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.
- (iii) Where designated within a flight information region, control areas and control zones shall form part of that flight information region.

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

2.6 CLASSIFICATION OF AIRSPACES

- 2.6.1 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 the PANS-ATM (Doc 4444), Chapter 9.)

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

- 2.6.2 Air Traffic Service provider shall select those airspace classes 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) OPERATIONS

- 2.7.1 Performance-based navigation, wherever applicable shall be applied for designated areas, tracks or ATS routes in accordance with the navigation specifications prescribed

in the Performance-based Navigation (PBN) Manual (Doc 9613) as amended on the basis of regional air navigation agreements.

2.7.2 Performance-based navigation shall be implemented.

2.7.3 The prescribed navigation specification shall be appropriate to the level of communications, navigation and air traffic services provided in the Male' Flight Information Region.

2.8 PERFORMANCE-BASED COMMUNICATION (PBC) OPERATIONS

2.8.1 When applying performance-based communication (PBC), Required Communications Performance (RCP) specifications shall be in accordance with Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869) as amended on the basis of regional air navigation agreements.

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

2.9 PERFORMANCE-BASED SURVEILLANCE (PBS) OPERATIONS

2.9.1 When applying performance-based surveillance (PBS), Required Surveillance Performance (RSP) specifications shall be as in accordance with the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869) as amended on the basis of regional air navigation agreements.

2.9.2 The prescribed RSP specification shall be appropriate to the air traffic services provided.

2.9.3 Where an RSP specification has been prescribed for performance-based surveillance, ATS units shall be provided with equipment capable of performance consistent with the prescribed RSP specification(s).

2.10 ESTABLISHMENT AND DESIGNATION OF THE UNITS PROVIDING AIR TRAFFIC SERVICES

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

2.10.1 Flight information centers shall be established to provide flight information service and alerting service within flight information regions, unless the responsibility of providing such services within a flight information region is assigned to an air traffic control unit having adequate facilities for the discharge of such responsibility.

2.10.2 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.

2.11 SPECIFICATIONS FOR FLIGHT INFORMATION REGIONS, CONTROL AREAS AND CONTROL ZONES

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

2.11.2 FLIGHT INFORMATION REGIONS

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

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

2.11.2.3 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 of the tables in Appendix 3 to MCAR 2.

2.11.3 CONTROL AREAS

2.11.3.1 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.

2.11.3.2 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).

2.11.3.2.1 The lower limit of a control area should, when practicable and desirable in order to allow freedom of action for VFR flights below the control area, be established at a greater height than the minimum specified in 2.11.3.2.

2.11.3.2.2 When the lower limit of a control area is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 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.

2.11.3.3 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.

2.11.4 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, shall be delineated to include the upper airspace within the lateral limits of a number of lower flight information regions or control areas.

2.11.5 CONTROL ZONES

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

2.11.5.2 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.

2.11.5.3 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.

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

2.11.5.5 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 shall be established at a level which can easily be identified by pilots. When this limit is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 to MCAR 2.

2.12 IDENTIFICATION OF AIR TRAFFIC SERVICES UNITS AND AIRSPACES

2.12.1 An area control centre or flight information centre shall be identified by the name of a nearby town or city or geographic feature.

2.12.2 An aerodrome control tower or approach control unit shall be identified by the name of the aerodrome at which it is located.

2.12.3 A control zone, control area or flight information region shall be identified by the name of the unit having jurisdiction over such airspace.

2.13 ESTABLISHMENT AND IDENTIFICATION OF ATS ROUTES

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

2.13.2 When warranted by density, complexity or nature of the traffic, 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.

2.13.3 ATS routes shall be identified by designators.

- 2.13.4 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.
- 2.13.5 Standard departure and arrival routes and associated procedures shall be identified in accordance with the principles set forth in Appendix 3 of this MCAR.

2.14 ESTABLISHMENT OF CHANGE-OVER POINTS

- 2.14.1 Change-over points shall 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.
 - 2.14.1.1 The establishment of change-over points shall be limited to route segments of 110 km (60 NM) or more, except where the complexity of ATS routes, the density of navigation aids or other technical and operational reasons warrant the establishment of change-over points on shorter route segments.
- 2.14.2 Unless otherwise established in relation to the performance of the navigation aids or frequency protection criteria, the change-over point on a route segment shall be the mid-point between the facilities in the case of a straight route segment or the intersection of radials in the case of a route segment which changes direction between the facilities.

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

2.15 ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

- 2.15.1 Significant points shall be established for the purpose of defining an ATS route or instrument approach procedure and/or in relation to the requirements of air traffic services for information regarding the progress of aircraft in flight.
- 2.15.2 Significant points shall be identified by designators.
- 2.15.3 Significant points shall be established and identified in accordance with the principles set forth in Appendix 2 of this MCAR.

2.16 ESTABLISHMENT AND IDENTIFICATION OF STANDARD ROUTES FOR TAXIING AIRCRAFT

- 2.16.1 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.
- 2.16.2 Standard routes for taxiing aircraft should be identified by designators distinctively different from those of the runways and ATS routes.

2.17 COORDINATION BETWEEN THE OPERATOR AND AIR TRAFFIC SERVICES

- 2.17.1 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-Air Operations, 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.

- 2.17.2 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.

2.18 COORDINATION BETWEEN MILITARY AUTHORITIES AND AIR TRAFFIC SERVICES

- 2.18.1 Air traffic services providers shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft.
- 2.18.2 Coordination of activities potentially hazardous to civil aircraft shall be effected in accordance with 2.19.
- 2.18.3 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.
- 2.18.3.1 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.
- 2.18.3.2 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.

2.19 COORDINATION OF ACTIVITIES POTENTIALLY HAZARDOUS TO CIVIL AIRCRAFT

- 2.19.1 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 Air Traffic Services Providers.
- 2.19.1.1 The coordination shall be affected to permit timely promulgation of information regarding the activities in accordance with MCAR 15.
- 2.19.2 The objective of the coordination shall be to achieve the best arrangements which will avoid hazards to civil aircraft and minimize interference with the normal operations of such aircraft.
- 2.19.2.1 In determining arrangements in 2.19.2, the following shall 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 ATS provider 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.

2.19.3 The Air Traffic service provider shall ensure that a safety risk assessment is conducted, as soon as practicable, for activities potentially hazardous to civil aircraft and that appropriate risk mitigation measures are implemented.

2.19.3.1 The Air Traffic service provider shall ensure that the organization or unit conducting or identifying activities potentially hazardous to civil aircraft contributes to the safety risk assessment by providing reports in order to facilitate consideration of all relevant safety significant factors.

2.19.4 The Air Traffic service provider shall be responsible for initiating the promulgation of information regarding the activities.

2.19.5 If activities potentially hazardous to civil aircraft take place on a regular or continuing basis, special committees shall be established as required to ensure that the requirements of all parties concerned are adequately coordinated.

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

2.19.7 The Air Navigation Service Provider together with the military authorities, through the civil/military coordination arrangements, shall establish procedures providing for a flexible use of airspace reserved for military or other special activities in order to provide added airspace capacity and to improve efficiency and flexibility of aircraft operations.

2.20 AERONAUTICAL DATA

2.20.1 Determination and reporting of air traffic services-related aeronautical data shall be in accordance with the accuracy and integrity classification as specified and are contained in PANS-AIM (Doc 10066), Appendix 1, which required to meet the needs of the end-user of aeronautical data.

2.20.2 Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

2.21 COORDINATION BETWEEN METEOROLOGICAL AND AIR TRAFFIC SERVICES AUTHORITIES

- 2.21.1 Meteorological and air traffic services providers shall make arrangements to ensure that aircraft receive the most up-to-date meteorological information for aircraft operations.
- 2.21.1.1 Meteorological and air traffic services authorities shall make arrangements where necessary for air traffic personnel to—:
- a) report, if observed by air traffic services personnel or communicated by aircraft, such other meteorological elements as may be agreed upon, in addition to using indicating instruments;
 - b) report as soon as possible to the associated meteorological office meteorological phenomena of operational significance, if observed by air traffic services personnel or communicated by aircraft, which have not been included in the aerodrome meteorological report;
 - c) 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).
- 2.21.2 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.

2.22 COORDINATION BETWEEN AERONAUTICAL INFORMATION SERVICES AND AIR TRAFFIC SERVICES AUTHORITIES

- 2.22.1 Aeronautical information services and air traffic services responsible for air traffic services shall make arrangements to ensure 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 responsible for air traffic services to report to the responsible aeronautical information services unit, with minimum 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.
- 2.22.2 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.

- 2.22.3 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, shall be in accordance with MCAR 15, Chapter 6.
- 2.22.3.1 The predetermined, internationally agreed AIRAC effective dates shall be observed by the responsible air traffic services when submitting the raw information/data to aeronautical information services.
- 2.22.4 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 necessary to meet the needs of the end-user of aeronautical data.

2.23 MINIMUM FLIGHT ALTITUDES

- 2.23.1 The Air Traffic service provider shall determine and promulgate minimum flight altitudes for each ATS route and control area.
- 2.23.2 The minimum flight altitudes determined shall provide a minimum clearance above the controlling obstacle located within the areas concerned.

2.24 SERVICE TO AIRCRAFT IN THE EVENT OF AN EMERGENCY

- 2.24.1 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.
- 2.24.1.1 An aircraft equipped with an appropriate data link capability and/or an SSR transponder to indicate that the aircraft is in a state of emergency, shall 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; and/or
 - c) activate the appropriate emergency and/or urgency capability of ADS or ADS-C; and/or
 - d) transmit the appropriate emergency message via CPDLC.
- 2.24.1.2 Human Factors principles shall be observed in communications between ATS units and aircraft in the event of an emergency.
- 2.24.2 ATS units shall attend promptly to requests by the aircraft when an occurrence of unlawful interference with an aircraft takes place or is suspected. Information pertinent to the safe conduct of the flight shall 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.

- 2.24.3 ATS units shall, in accordance with locally agreed procedures, immediately inform the appropriate designated authorities and exchange necessary information with the operator or its designated representative when an occurrence of unlawful interference with an aircraft takes place or is suspected,

2.25 IN-FLIGHT CONTINGENCIES

2.25.1 STRAYED OR UNIDENTIFIED AIRCRAFT

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

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

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

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

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

- 2.25.1.1 An air traffic services unit shall take all necessary steps as outlined in sub regulations 2.25.1.1.1 and 2.25.1.1.2 to assist strayed aircraft and to safeguard its flight as soon as the unit becomes aware of a strayed aircraft.

- 2.25.1.1.1 Where 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, with 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.

- 2.25.1.1.2 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.

2.25.1.2 When an air traffic services unit becomes aware of an unidentified aircraft in its area, it shall endeavor to establish the identity of the aircraft in accordance with locally agreed procedures. To this end, the air traffic services unit shall take the following steps:

- 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.

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

2.25.1.3 The appropriate designated authority shall immediately be informed, in accordance with locally agreed procedures, when the ATS unit considers that a strayed or unidentified aircraft may be the subject of unlawful interference.

2.25.2 INTERCEPTION OF CIVIL AIRCRAFT

2.25.2.1 When an air traffic services unit learns that an aircraft is being intercepted in its area of responsibility, the air traffic service unit 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.

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

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

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

2.26 TIME IN AIR TRAFFIC SERVICES

- 2.26.1 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.
- 2.26.2 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.
- 2.26.3 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.
- 2.26.4 Wherever data link communications are utilized by an air traffic services unit, clocks and other time-recording devices shall be checked as necessary to ensure correct time to within 1 second of UTC.
- 2.26.5 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.
- 2.26.6 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.

2.27 REQUIREMENTS FOR CARRIAGE AND OPERATION OF PRESSURE-ALTITUDE REPORTING TRANSPONDERS

- 2.27.1 The requirements for carriage and operation of pressure-altitude reporting transponders shall be as follows.
 - 2.27.1.1 Pilots shall operate transponders and select modes and codes in accordance with ATC instructions. In particular, when entering Male' FIR, pilots who have already received specific instructions from ATC concerning the setting of the transponder shall maintain that setting until otherwise instructed.
 - 2.27.1.2 Pilots of aircraft about to enter Male' FIRs who have not received specific instructions from ATC concerning the setting of the transponder shall operate the transponder on Mode A/3, Code 2000 before entry and maintain that code setting until otherwise instructed.
 - 2.27.1.3 If the pilot of an aircraft encountering a state of emergency has previously been directed by ATC to operate the transponder on a specific code, that code setting shall be maintained unless, in special circumstances, the pilot has decided or has been advised otherwise. Where ATC has not requested a code to be set, the pilot will set the transponder to Mode A Code 7700. Continuous monitoring of responses on Mode A/3, Code 7700 shall be maintained.

2.27.1.4 If the pilot of an aircraft experiences radio communication failure, he shall select Mode A/3, Code 7600 and follow established procedures. Subsequent control of the aircraft shall be based on those procedures.

2.27.1.5 Pilots of aircraft in flight subjected to unlawful interference shall endeavor to set the transponder to Mode A, Code 7500 to make the situation known, unless circumstances warrant the use of Mode A/3, Code 7700.

2.27.2 MANDATORY CARRIAGE OF SSR TRANSPONDER:

2.27.2.1 Except as otherwise authorised, no aircraft shall be operated:

- a) within controlled airspace above FL 150 unless the aircraft is equipped with a functioning transponder including Mode C automatic altitude reporting; or
- b) within the Male' Control Area and Control Zone, unless the aircraft is equipped with a functioning transponder.

2.27.2.2 No transponder shall be operated on Mode A or Mode C unless it is operated in accordance with ATC instructions. Where the transponder or automatic altitude reporting equipment required fails during flight, the aircraft may proceed to the next aerodrome of intended landing and thereafter in accordance with an ATC clearance to complete a planned itinerary or to proceed to a repair base.

2.27.2.3 An ATC unit may, on application in writing, issue authorization to an aircraft not equipped according to paragraph 2.27.2.1 above to be operated within the airspace where the unit provides air traffic services if such operation does not compromise the safety of air traffic.

2.28 FATIGUE MANAGEMENT

2.28.1 An Air Traffic Services provider shall establish procedures for the purpose of managing fatigue in the provision of air traffic services in accordance with these regulations, procedures shall be based upon scientific principles, knowledge, and operational experience, with the aim of ensuring that air traffic controllers perform at an adequate level of alertness. To this aim:

- a) The air traffic service provider shall, prescribe scheduling limits in accordance with Appendix 5; or
- b) The air traffic service provider shall use a fatigue risk management system (FRMS) to manage fatigue in accordance with Appendix 6.

2.28.2 For the purposes of managing fatigue-related safety risks, the air traffic services provider shall—

- a) establish air traffic controller schedules commensurate with the service(s) provided and in compliance with the prescriptive limitation regulations in accordance with 2.28.1 a); or
- b) establish an FRMS in compliance with the regulations in accordance with 2.28.1 b).

2.28.3 Where the air traffic services provider complies with prescriptive limitation regulations, an air traffic service provider shall:

- a) provide evidence that the limitations are not exceeded and that non-duty period requirements are met;
- b) ensure that its personnel are familiarized with the principles of fatigue management and its policies with regard to fatigue management;
- c) establish a process to allow variations from the applicable scheduling limits to address any additional risks associated with sudden, unforeseen operational circumstances;
- d) demonstrates that any associated risk is managed to a level of safety equivalent to, or better than, that achieved through the applicable scheduling limits, the CAA may approve variations to these limits in order to address strategic operational needs in exceptional circumstances.

2.28.4 Where an air traffic services provider implements an FRMS to manage fatigue-related safety risks, the air traffic service provider shall:

- a) have processes to integrate FRMS functions with its other safety management functions;
- b) implement an FRMS that provides a level of safety acceptable to the CAA;
- c) obtain approval of CAA in accordance with prescribed procedures.

2.28.5 Deviation to the scheduling limitations established by the CAA shall be approved at the discretion of CAA.

2.28.6 The air traffic services provider shall subject to 2.28.5 be required to provide the following for approval of deviations to scheduling limits—

- a) the reason for the need to deviate;
- b) the extent of the deviation;
- c) the date and time of enactment of the deviation; and
- d) a safety case, outlining mitigations, to support the deviation.

2.28.7 A person holding an air traffic controller licence shall not act as an air traffic controller nor shall an employer allow a licensed controller, if the controller or the employer knows or suspects that the controller is suffering from or, having regard to the circumstances of the period of duty to be undertaken, is likely to suffer from, such fatigue as may endanger the safety of any aircraft to which an air traffic control service may be provided.

2.29 SAFETY MANAGEMENT

Refer MCAR-172, Chapter 2.37.

2.30 COMMON REFERENCE SYSTEMS

2.30.1 HORIZONTAL REFERENCE SYSTEM

2.30.1.1 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.

2.30.2 VERTICAL REFERENCE SYTEM

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

2.30.3 TEMPORAL REFERENCE SYSTEM:

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

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

2.31 LANGUAGE PROFICIENCY

2.31.1 An air traffic services provider shall ensure that air traffic controllers speak and understand the English language sufficient for radiotelephony communications as per ATC licensing requirements.

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

2.32 CONTINGENCY ARRANGEMENTS

2.32.1 The air traffic services provider 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.

2.32.2 The contingency plans shall be developed with the assistance of International Civil Aviation Organization in coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

2.33 IDENTIFICATION AND DELINEATION OF PROHIBITED, RESTRICTED AND DANGER AREAS

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

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

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

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

- 2.33.4 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.
- 2.33.5 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.

2.34 INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE

- 2.34.1 The air traffic service provider shall ensure that an instrument flight procedure design service is in place in accordance with Appendix 7.

CHAPTER 3 - AIR TRAFFIC CONTROL SERVICE

3.1 APPLICATION

3.1.1 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

3.1.2 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:
 - (i) by an area control centre; or
 - (ii) by the unit providing approach control service in a control zone or in a control area of limited extent which is designated primarily for the provision of approach control service and where no area control centre is established.
- b) Approach control service:
 - (i) by an aerodrome control tower or area control centre when it is necessary or desirable to 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;
 - (ii) 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.

3.3 OPERATION OF AIR TRAFFIC CONTROL SERVICE

3.3.1 An air traffic control unit, in order to provide air traffic control service 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 Air traffic control units shall be equipped with devices that record background communication and the aural environment at air traffic controller workstations, capable of retaining the information recorded during at least the last twenty-four hours of operation.

3.3.4 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,

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

3.3.5 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, or
 - 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.

- 3.3.5.1 Where a reduced vertical separation minimum of 300 m (1 000 ft.) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the continued application of this vertical separation minimum meets the safety objectives. The scope of regional monitoring programmes shall be adequate to conduct analyses of aircraft group performance and evaluate the stability of altimetry system error.
- 3.3.5.2 Where RCP/RSP specifications are applied, programmes shall be instituted for monitoring the performance of the infrastructure and the participating aircraft against the appropriate RCP and/or RSP specifications, to ensure that operations in the applicable airspace continue to meet safety objectives.
- 3.3.5.2.1 The scope of monitoring programmes shall be adequate to evaluate communication and/or surveillance performance, as applicable.
- 3.3.5.3 Air Traffic Service Providers are required to submit Large Height Deviation (LHD) reports to the Monitoring Agency for Asia Region (MAAR) regularly on prescribed intervals.

Note: MAAR is the designated agency for RVSM monitoring program of Maldivian Airspace.

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 those prescribed by the provisions of the PANS-ATM (Doc 4444) and the Regional Supplementary Procedures as applicable under the prevailing circumstances except that, where types of aids are used or circumstances prevail which are not covered by these Regulations, other separation minima shall be established as necessary by:
 - 1) the Air Traffic service provider following consultation with operators, for routes or portions of routes contained within the sovereign airspace of Maldives;
 - 2) regional air navigation agreements for routes or portions of routes contained within airspace over the high seas.
 - b) The selection of separation minima shall be made in consultation between the appropriate ATS authorities responsible for the provision of air traffic services in neighbouring airspaces when:
 - 1) Traffic will pass from one into the other of the neighbouring airspaces;

- 2) routes are closer to the common boundary of the neighbouring airspaces than the separation minima applicable in the circumstances.

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

3.5.1.1 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

3.5.2.1 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.

3.6.1.3.2 Departing aircraft.

The responsibility for control of a departing aircraft shall be transferred from the aerodrome control tower to the unit providing approach control service:

- a) when visual meteorological conditions prevail in the vicinity of the aerodrome:
 - 1) prior to the time the aircraft leaves the vicinity of the aerodrome, or
 - 2) prior to the aircraft entering instrument meteorological conditions, or
 - 3) at a prescribed point or level,as specified in letters of agreement or ATS unit instructions;
- b) when instrument meteorological conditions prevail at the aerodrome:
 - 1) immediately after the aircraft is airborne, or
 - 2) at a prescribed point or level,as specified in letters of agreement or ATS unit instructions.

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

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

3.6.2 COORDINATION OF TRANSFER

3.6.2.1 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 or ADS-B immediately prior to the transfer.

3.6.2.2.2 Where transfer of control is to be effected using ADS-C data, the 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;
- e) any necessary instructions or information on other matters such as approach or departure manoeuvres, communications, and the time of expiry of the clearance.

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.

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 Unless otherwise specified, voice read-back of CPDLC messages shall not be required.

- 3.7.3.3 Vehicle drivers operating or intending to operate on the manoeuvring area shall read back to the air traffic controller safety-related parts of instructions which are transmitted by voice, e.g., instructions to enter, hold short of, cross and operate on any operational runway or taxiway.

- 3.7.3.4 The controller shall listen to the read-back to ascertain that the instruction has been correctly acknowledged by the vehicle driver and shall take immediate action to correct any discrepancies revealed by the read-back.

3.7.4 COORDINATION 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 Air Traffic service provider, aircraft shall contact a downstream air traffic control unit, for the purpose of receiving a downstream clearance prior to the transfer of control point.
- a) Aircraft shall maintain the necessary two-way communication with the current air traffic control unit whilst obtaining a downstream clearance.
 - b) A clearance issued as a downstream clearance shall be clearly identifiable as such to the pilot.
 - c) 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.
 - d) 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 Air traffic flow management shall be implemented on the basis of regional air navigation agreements or, if appropriate, through multilateral agreements.
- 3.7.5.2.1 Such agreements shall 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.

- 3.7.5.3.1 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.

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 Air Traffic service provider 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 shall provide for the display of safety-related alerts and warnings, including conflict alert, conflict prediction, minimum safe altitude warning and unintentionally duplicated SSR codes.

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, where available, shall be utilized to:

- a) monitor the movement 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.

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.

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 (TIBA) by aircraft may be applied in designated airspace. Guidance on traffic information broadcasts by aircraft and related operating procedures is contained in Attachment B.

- 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:
- the information should be in accordance with 4.3.2.5, as applicable, subject to regional air navigation agreements;
 - the aerodromes for which reports and forecasts are to be included should be as determined by regional air navigation agreements;
 - 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;
- 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 if/when 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.

4.3.2.3 HF OFIS broadcasts concerning aerodromes designated for use by international air services shall be available in the English language.

4.3.2.4 (Reserved)

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: Information on significant en-route weather phenomena should be in the form of available SIGMET as prescribed in MCAR 3.
- b) Aerodrome information including:
 - (i) name of aerodrome;
 - (ii) time of observation;
 - (iii) essential operational information;
 - (iv) surface wind direction and speed; if appropriate, maximum wind speed;
 - (v) * visibility and, when applicable, runway visual range (RVR);
 - (vi) * present weather;
 - (vii) * cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available; and
 - (viii) * aerodrome forecast.

**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 shall be provided as determined by regional air navigation agreements.

4.3.3.2 Whenever such broadcasts are provided:

- a) the aerodromes for which reports, and forecasts are to be included shall be as determined by regional air navigation agreements;
- b) each aerodrome message shall be identified by the name of the aerodrome to which the information applies;
- c) the latest available information shall be included together with the time of that observation when information has not been received in time for a broadcast;
- d) the broadcasts shall be continuous and repetitive;
- e) The VHF OFIS broadcast message shall take into consideration human performance. The broadcast message shall, whenever practicable, not exceed five minutes, care being taken that the readability is not impaired by the speed of the transmission;
- f) the broadcast message shall be updated on a scheduled basis as determined by regional air navigation agreements. In addition, it should be expeditiously updated immediately if/when a significant change occurs; and
- g) the VHF OFIS message shall be prepared and disseminated by the most appropriate unit(s) as designated by the CAA.

4.3.3.3 VHF OFIS broadcasts concerning aerodromes designated for use by international air services should be available in the English language.

4.3.3.4 (Reserved)

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 (Reserved)

4.3.4.8 The Voice-ATIS broadcast message should, whenever practicable, not exceed 30 seconds, care being taken that the readability of the ATIS message is not impaired by

the speed of the transmission or by the identification signal of a navigation aid used for transmission of ATIS. The ATIS broadcast message should take into consideration human performance.

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.

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.

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 appropriate 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 Air Traffic service provider, provide the aircraft with the current altimeter setting; and
- g) the meteorological information shall be extracted from the local meteorological routine or special report.

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 appropriate 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

4.3.7.1 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; and, if visibility/RVR 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;
- n) present weather;
- o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- p) air temperature;
- q) dew point temperature;
- 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.

4.3.8 ATIS FOR ARRIVING AIRCRAFT.

4.3.8.1 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 (in degrees magnetic) 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; and, if visibility/RVR 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;
- n) present weather;
- o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- p) air temperature;
- q) dew point temperature;
- 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

4.3.8.2 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 (in degrees magnetic) 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; and, if visibility/RVR 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) present weather;
- n) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- o) air temperature;
- p) dew point temperature;
- 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.

4.4 VOLMET BROADCASTS AND D-VOLMET SERVICE

- 4.4.1 HF and/or VHF VOLMET broadcasts and/or D-VOLMET service shall 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 shall use standard radiotelephony phraseologies.

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.

5.1.3.1 The responsible FIC or ACC shall in turn notify the rescue coordination centre.

5.1.3.2 The 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.

5.1.3.3 Where 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, or where the likelihood of a forced landing has not been determined, except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants, or when
- 4) an aircraft is known or believed to be the subject of unlawful interference.

c) **Distress phase** when:

- 1) following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the 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 Such part of the information specified in 5.2.2, which is not available at the time notification is made to a rescue coordination centre, shall be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

5.2.3 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

5.3.1 Air traffic services units shall, as necessary, use all available communication facilities to establish and maintain communication with an aircraft in a state of emergency, and to request news of the aircraft.

5.4 PLOTTING AIRCRAFT IN A STATE OF EMERGENCY

5.4.1 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.

5.4.2 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 centre or 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 centre 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.
- 6.1.1.2 When an RCP specification has been prescribed by the CAA for performance-based communication, 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 specification(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 shall 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.

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 a) 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 control using radar or ADS-B 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 should 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 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 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 6.2.2.1 and 6.2.2.2 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 INFORMATION REGIONS

- 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 should include provisions for communications by direct speech alone, or in combination with data link communications, with automatic recording, whereby for the purpose of transfer of control using radar, ADS-B or ADS-C data, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen 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

- 6.2.4.1 Appropriate procedures for direct-speech communications should 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 other systems (e.g., ADS-B, ADS-C), 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 Air traffic services units shall be supplied with available detailed information on the location, vertical extent, direction and rate of movement of meteorological phenomena in the vicinity of the aerodrome, and particularly in the climb-out and approach areas, which could be hazardous to aircraft operations.
- 7.1.1.3 When computer-processed upper air data are made available to air traffic services units in digital form for use by air traffic services computers, the contents, format, and transmission arrangements shall be as agreed between the Meteorological Authority and the Air Traffic service provider.

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.
 - 7.1.2.1.1 The reports and forecasts referred in 7.1.2.1 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.
- 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.
 - 7.1.3.1.1 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.
 - 7.1.3.1.2 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.
- 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.
- 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 shall be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays shall be related to the same location(s) of observations and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.
- 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

- 7.1.5.1 Current meteorological reports and forecasts shall be supplied to communication stations for flight information purposes,
- 7.1.5.2 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

- 7.2.1 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 appropriate ATS unit(s) on a timely basis consistent with the use of the service(s) and aid(s) involved.

7.4 INFORMATION ON UNMANNED FREE BALLOONS

- 7.4.1 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 02 – Rules of the Air.

7.5 INFORMATION CONCERNING VOLCANIC ACTIVITY

- 7.5.1 ATS units shall be informed, in accordance with local agreement, of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud which could affect airspace used by flights within their area of responsibility.
- 7.5.2 Area control centres and flight information centres shall be provided with volcanic ash advisory information issued by the associated VAAC.

7.6 INFORMATION CONCERNING RADIOACTIVE MATERIALS AND TOXIC CHEMICAL "CLOUDS"

- 7.6.1 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 SPECIFICATIONS AND THE IDENTIFICATION OF ATS ROUTES OTHER THAN STANDARD DEPARTURE AND ARRIVAL ROUTES

(Chapter 2, 2.7 and 2.13 refer)

1. DESIGNATORS FOR ATS ROUTES AND NAVIGATION SPECIFICATIONS

1.1 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.

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

1.2 In order to meet this purpose, the designation system shall:

- a) permit the identification of any ATS route in a simple and unique manner;
- b) avoid redundancy;
- c) be usable by both ground and airborne automation systems;
- d) permit utmost brevity in operational use; and
- e) provide sufficient possibility of extension to cater for any future requirements without the 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 When prescribed by the Air Traffic service provider or on the basis of regional air navigation agreements, a supplementary letter may be added after the basic designator of the ATS route in 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 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 Requirements for designators shall be notified to the Regional Offices of ICAO for coordination.

4. USE OF DESIGNATORS IN COMMUNICATIONS

- 4.1 In printed communications, the designator shall be expressed at all times by not less than two and not more than six characters.
- 4.2 In voice communications, the basic letter of a designator shall be spoken in accordance with the ICAO spelling alphabet.
- 4.3 Where the prefixes K, U or S specified in 2.3 are used, they shall, in voice communications, be spoken as follows:

K — KOPTER, U — UPPER, S — SUPERSONIC

The word “kopter” shall be pronounced as in the word “helicopter” and the words “upper” and “supersonic” as in the English language.
- 4.4 Where the letters “F” or “G”, specified in 2.4 are used, the flight crew should not be required to use them in voice communications.

Appendix 2 PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

(Chapter 2, Section 2.15 refers)

1. ESTABLISHMENT OF SIGNIFICANT POINTS

- 1.1 Significant points should, whenever possible, be established with reference to ground-based radio or space-based navigation aids, preferably VHF or higher frequency aids.
- 1.2 Where such ground-based or space-based radio navigation aids do not exist, significant points shall be established at locations which can be determined by self-contained airborne navigation aids, or, where navigation by visual reference to the ground is to be effected, by visual observation. Specific points may be designated as “transfer of control” points by agreement between adjacent air traffic control units or control positions concerned.

2. DESIGNATORS FOR SIGNIFICANT POINTS MARKED BY THE SITE OF A RADIO NAVIGATION AID

- 2.1 Plain language name for significant points marked by the site of a radio navigation aid
 - 2.1.1 Whenever practicable, significant points shall be named with reference to an identifiable and preferably prominent geographical location.
 - 2.1.2 In selecting a name for the significant point, care shall be taken to ensure that the following conditions are met:
 - a) the name shall not create difficulties in pronunciation for pilots or ATS personnel when 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 Requirements for coded designators shall be notified to the Regional Offices of ICAO for coordination.

3. DESIGNATORS FOR SIGNIFICANT POINTS NOT MARKED BY THE SITE OF A RADIO NAVIGATION AID

3.1 Where a significant point is required at a position not marked by the site of a radio navigation aid, and is used for ATC purposes, it shall be designated by a unique five letter pronounce-able "name-code". This name-code designator then serves as the name as well as the coded designator of the significant point.

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

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

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

3.6 In areas where no system of fixed routes is established or where the routes followed by aircraft vary depending on operational considerations, significant points shall be determined and reported in terms of World Geodetic System — 1984 (WGS-84) geographical coordinates, except that permanently established significant points serving as exit and/or entry points into such areas shall be designated in accordance with the applicable provisions in paragraph 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.

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

(Chapter 2, 2.13 refers)

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

1. DESIGNATORS FOR STANDARD DEPARTURE AND ARRIVAL ROUTES AND ASSOCIATED PROCEDURES

Note: 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

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

- a) the coded designator or name-code of the significant point described in 2.1.1 a); followed by
- b) the validity indicator in 2.1.1 b); followed by
- c) the route indicator in 2.1.1 c), where required.

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

3. ASSIGNMENT OF DESIGNATORS

3.1 Each route shall be assigned a separate designator.

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

4. ASSIGNMENT OF VALIDITY INDICATORS

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

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

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

5. EXAMPLES OF PLAIN LANGUAGE AND CODED DESIGNATORS

5.1 Example 1: Standard departure route — instrument:

- a) Plain language designator: BRECON ONE DEPARTURE
- b) Coded designator: BCN 1

5.1.1 Meaning: The designator identifies a standard instrument departure route which terminates at the significant point BRECON (basic indicator). BRECON is a radio navigation facility with the identification BCN (basic indicator of the coded designator). The validity indicator ONE (1 in the 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 designator: KODAP TWO ALPHA ARRIVAL
- b) Coded designator: KODAP 2 A

5.2.1 Meaning: This designator identifies a standard instrument arrival route which begins at the significant point KODAP (basic indicator). KODAP is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-letter name-code in accordance with Appendix 2. The validity indicator TWO (2) signifies that a change has been made from the previous version ONE (1) to the now effective version TWO (2). The route indicator ALPHA (A) identifies one of 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 designator: ADOLA FIVE BRAVO DEPARTURE VISUAL
- b) Coded designator: ADOLA 5 B

5.3.1 Meaning: This designator identifies a standard departure route for controlled VFR flights which terminates at ADOLA, a significant point not marked by the site of a radio navigation facility. The validity indicator FIVE (5) signifies that a change has been made from the previous version FOUR (4) to the now effective version FIVE (5). The route indicator BRAVO (B) identifies one of several routes established with reference to ADOLA.

6. COMPOSITION OF DESIGNATORS FOR MLS/RNAV APPROACH PROCEDURES

6.1 PLAIN LANGUAGE DESIGNATOR

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

- a) "MLS"; followed by
- b) a basic indicator; followed by
- c) a validity indicator; followed by
- d) a route indicator; followed by
- e) the word "approach"; followed by
- f) the designator of the runway for which the procedure is designed.

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

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

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

- 6.1.5 The designator of the runway shall be in accordance with ASC 139-5, 5.4.
- 6.2 CODED DESIGNATOR
- 6.2.1 The coded designator of an MLS/RNAV approach procedure shall consist of:
- a) “MLS”; followed by
 - b) the coded designator or name-code of the significant point described in 6.1.1 b); followed by
 - c) the validity indicator in 6.1.1 c); followed by
 - d) the route indicator in 6.1.1 d); followed by
 - e) the runway designator in 6.1.1 f).
- 6.3 ASSIGNMENT OF DESIGNATORS
- 6.3.1 The assignment of designators for MLS/RNAV approach procedures shall be in accordance with paragraph 3. Procedures having identical tracks, but different flight profiles shall be assigned separate route indicators.
- 6.3.2 The route indicator letter for MLS/RNAV approach procedures shall be assigned uniquely to all approaches at an airport until all the letters have been used. Only then shall the route indicator letter be repeated. The use of the same route indicator for two routes using the same MLS ground facility shall not be permitted.
- 6.3.3 The assignment of validity indicator for approach procedures shall be in accordance with paragraph 4.
- 6.4 EXAMPLE OF PLAIN LANGUAGE AND CODED DESIGNATORS
- 6.4.1 Example:
- a) Plain language designator: MLS HAPPY ONE ALPHA APPROACH RUNWAY ONE EIGHT LEFT
 - b) Coded designator: MLS HAPPY 1 A 18L
- 6.4.2 Meaning: The designator identifies an MLS/RNAV approach procedure which begins at the significant point HAPPY (basic indicator). HAPPY is a significant point not marked by the site of a radio navigation facility and therefore assigned a five-letter name-code in accordance with Appendix 2. The validity indicator ONE (1) signifies that either the original version of the route is still in effect, or a change has been made from the previous version NINE (9) to the now effective version ONE (1). The route indicator ALPHA (A) identifies one of several routes established with reference to HAPPY and is a specific character assigned to this route.

7. USE OF DESIGNATORS IN COMMUNICATIONS

- 7.1 In voice communications, only the plain language designator shall be used.
- Note: For the purpose of identification of routes, the words “departure”, “arrival” and “visual” described in 2.1.1 d) and 2.1.1 e) are considered to be an integral element of the plain language designator.*
- 7.2 In printed or coded communications, only the coded designator shall be used.

8. DISPLAY OF ROUTES AND PROCEDURES TO AIR TRAFFIC CONTROL

- 8.1 A detailed description of each currently effective standard departure and/or arrival route/approach procedure, including the plain language designator and the coded designator, shall be displayed at the working positions at which the routes/procedures are assigned to aircraft as part of an ATC clearance, 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**

<i>Class</i>	<i>Type of flight</i>	<i>Separation provided</i>	<i>Service provided</i>	<i>Speed limitation*</i>	<i>Radio communication requirement</i>	<i>Subject to an ATC clearance</i>
A	IFR only	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
B	IFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes
C	IFR	IFR from IFR IFR from VFR	Air traffic control service	Not applicable	Continuous two-way	Yes
	VFR	VFR from IFR	1) Air traffic control service for separation from IFR; 2) VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
D	IFR	IFR from IFR	Air traffic control service, traffic information about VFR flights (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	IFR/VFR and VFR/VFR traffic information (and traffic avoidance advice on request)	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
E	IFR	IFR from IFR	Air traffic control service and, as far as practical, traffic information about VFR flights	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	Yes
	VFR	Nil	Traffic information as far as practical	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
F	IFR	IFR from IFR as far as practical	Air traffic advisory service; flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
G	IFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	Continuous two-way	No
	VFR	Nil	Flight information service	250 kt IAS below 3 050 m (10 000 ft) AMSL	No	No
* When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000 ft.						

Appendix 5 PRESCRIPTIVE FATIGUE MANAGEMENT REGULATIONS

Chapter 2, 2.28.1 (a) refer

1. DEFINITIONS

- 1.1 **“Duty period”** means a period which starts when an air traffic controller is required by an air traffic services provider to report for or to commence a duty and ends when that person is free from all duties.
- 1.2 **“Fatigue”** means a physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person’s alertness and ability to perform safety-related operational duties.
- 1.3 **“Rest period”** means a continuous and defined period of time, subsequent to and/or prior to duty, during which an air traffic controller is free of all duties.
- 1.4 **“Operational Duty”** the period during which an air traffic controller is exercising the privileges of the license at an operational position.
- 1.5 **“Night Duty”** means a period of duty defined as starting at 0030 (LT) and ending at 0530 (LT).

2. THE AIR TRAFFIC SERVICES PROVIDER’S RESPONSIBILITY

- 2.1 The Air Traffic service provider shall ensure that duty rosters are prepared and published sufficiently in advance to provide ATCOs the opportunity to plan adequate rest. Consideration should be given to the cumulative effects of undertaking long duty hours interspersed with minimum non-work periods, and of avoiding rosters that result in the serious disruption of an established pattern of working and sleeping. Rosters should cover a period of at least 30 days.
- 2.2 Minimum non-work periods, need to provide adequate rest such that the ATCO can achieve a suitable sleep period.
- 2.3 In order to avoid any detriment to an ATCO’s performance, opportunities to consume a meal must be arranged when the duty period exceeds 6 hours.
- 2.4 The service provider should not require an ATCO to undertake any safety related task if it is known or suspected that the ATCO is fatigued to the extent that safety may be adversely affected.
- 2.5 To provide evidence of compliance with prescriptive limits, records will be kept for 6 months of the duties performed and non-duty periods achieved so as to facilitate inspection by the air traffic service provider’s authorized personnel and audit by the CAA.

3. AIR TRAFFIC CONTROLLERS' RESPONSIBILITIES

- 3.1 An air traffic controller shall not perform any safety relevant tasks when he or she knows that he or she is fatigued or feels unfit to the extent that safety may be adversely affected.
- 3.2 ATCOs should make best use of the facilities and opportunities that are provided for rest and for the consumption of meals. They should plan and use rest periods to ensure that they are fully rested.

4. PRESCRIPTIVE LIMITATION PARAMETERS FOR AIR TRAFFIC CONTROLLERS

4.1 Maximum Period of Duty

- 4.1.1 Except in an emergency, an air traffic controller shall not serve or be required to serve for more than 12 consecutive hours.
- 4.1.2 The aggregate of duty period hours may not exceed 200 hours within a defined period of 720 consecutive hours or 30 consecutive days.

4.2 Limit on and Interval following Consecutive Periods of Duty

- 4.2.1 If the maximum number of consecutive days of duty is rostered, there shall be a minimum interval of 48 hours between the end of one consecutive period of duty days and the next.
- 4.2.2 Within 720 consecutive hours (30 days) there shall be not fewer than three intervals between the conclusion of one period of duty and the commencement of the next period of duty. These intervals shall total not less than 180 hours with the minimum interval being not less than 48 hours.

4.3 Intervals between Periods of Duty

- 4.3.1 There shall be an interval of not less than 12 hours between the conclusion of one period of duty and the commencement of the next period of duty. This interval may only be reduced with the approval of the CAA by providing a safety case.

4.4 Breaks in Operational Duty

- 4.4.1 No operational duty shall exceed a period of two hours without there being taken during, or at the end of, that period a break or breaks totaling not less than 30 minutes during which period a controller does not exercise the privileges of their licence.
- 4.4.2 Where workload for any part of the day or night is judged to be low and the activity is spasmodic rather than continuous, periods of operational duty, at these times, may be extended to a maximum of three hours, provided that the following break is taken pro-rata (e.g. 45 minutes after 3 hours or 60 minutes after 4 hours).

Note: Breaks shall include all measures necessary to ensure that controllers will not be suffering, to any extent as a consequence of their duties, mental or physical fatigue whilst exercising the privileges of their licence. Such measures are expected to include a certain detachment from the operation, e.g. rest areas.

4.5 Limits on Night Duties

- 4.5.1 Not more than two night duties may be worked in immediate succession. In all cases the maximum night duty period shall not exceed 9.5 hours and the night duty must conclude no later than 0830 hours.

4.6 Interval After Night Duties

- 4.6.1 Upon the conclusion of two night duties in immediate succession, there shall be an interval of a minimum of 54 hours before the commencement of the next period of duty.

4.7 Limits for On Call Duties

- 4.7.1 The maximum On Call period of duty, where the controller does not attend the place of work, shall be 20 hours. For the purpose of this particular limitation, all On Call Duty time spent in attendance at the place of work shall count double. For example, if a controller attends the place of work ten hours after commencing an On Call Duty the 20-hour maximum On Call period of duty will be reached when the controller completes five hours at the place of work. [10 hours + (5 hours x 2 = 10 hours) = 20 hours.]
- 4.7.2 No more than two On Call duties shall be worked in a period of 144 hours (6 days).
- 4.7.3 Prior to commencing an On Call duty controllers are to be rested in accordance with the regulations and, if called in, will be subject to the minimum interval between duty periods as specified in 4.3. An On Call duty controller who is not called in during an overnight On Call duty shall not be utilized before midday next following.
- 4.7.4 Units needing to operate in exceptional circumstances outside these limitations may seek modification from the CAA.

Appendix 6 FATIGUE RISK MANAGEMENT SYSTEM (FRMS) REQUIREMENTS

(Chapter 2, 2.28.1 (b) refer)

Air traffic services providers may use a fatigue risk management system (FRMS) to manage fatigue, which shall contain at a minimum:

1. FRMS POLICY AND DOCUMENTATION

1.1 FRMS policy

- 1.1.1 The air traffic services provider shall define its FRMS policy, with all elements of the FRMS clearly identified.
- 1.1.2 The policy shall:
 - a) define the scope of FRMS operations;
 - b) reflect the shared responsibility of management, air traffic controllers, and other involved personnel;
 - c) clearly state the safety objectives of the FRMS;
 - d) be signed by the accountable executive of the organization;
 - e) be communicated, with visible endorsement, to all the relevant areas and levels of the organization;
 - f) declare management commitment to effective safety reporting;
 - g) declare management commitment to the provision of adequate resources for the FRMS;
 - h) declare management commitment to continuous improvement of the FRMS;
 - i) require that clear lines of accountability for management, air traffic controllers, and all other involved personnel are identified; and
 - j) require periodic reviews to ensure it remains relevant and appropriate.

1.2 FRMS documentation

- 1.2.1 An air traffic services provider shall develop and keep current FRMS documentation that describes and records:
 - a) FRMS policy and objectives;
 - b) FRMS processes and procedures;
 - c) accountabilities, responsibilities and authorities for these processes and procedures;
 - d) mechanisms for ongoing involvement of management, air traffic controllers, and all other involved personnel;
 - e) FRMS training programmes, training requirements and attendance records;

- f) scheduled and actual duty and non-duty periods and break periods between periods of time-in-position in a duty period with significant deviations and reasons for deviations noted; and

Note. — Significant deviations are described in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

- g) FRMS outputs including findings from collected data, recommendations, and actions taken.

2. FATIGUE RISK MANAGEMENT PROCESSES

2.1 Identification of fatigue-related hazards

Note. — Provisions on the protection of safety information are contained in Annex 19.

An air traffic services provider shall develop and maintain three fundamental and documented processes for fatigue hazard identification:

- 2.1.1 Predictive. The predictive process shall identify fatigue hazards by examining air traffic controller scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include, but are not limited to:
 - a) air traffic services or industry operational experience and data collected on similar types of operations or from other industries with shift work or 24-hour operations;
 - b) evidence-based scheduling practices; and
 - c) bio-mathematical models.
- 2.1.2 Proactive. The proactive process shall identify fatigue hazards within current air traffic services operations. Methods of examination may include, but are not limited to:
 - a) self-reporting of fatigue risks;
 - b) fatigue surveys;
 - c) relevant air traffic controller performance data;
 - d) available safety databases and scientific studies;
 - e) tracking and analysis of differences in planned and actual worked times; and
 - f) observations during normal operations or special evaluations.
- 2.1.3 Reactive. The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:
 - a) fatigue reports;
 - b) confidential reports;
 - c) audit reports; and
 - d) incidents.

2.2 Fatigue-related risk assessment

- 2.2.1 An air traffic services provider shall develop and implement risk assessment procedures that determine when the associated risks require mitigation.
- 2.2.2 The risk assessment procedures shall review identified fatigue hazards and link them to:
- a) operational processes;
 - b) their probability;
 - c) possible consequences; and
 - d) the effectiveness of existing preventive controls and recovery measures.

2.3 Risk mitigation

- 2.3.1 An air traffic services provider shall develop and implement fatigue risk mitigation procedures that:
- a) select the appropriate mitigation strategies;
 - b) implement the mitigation strategies; and
 - c) monitor the strategies' implementation and effectiveness.

3. FRMS SAFETY ASSURANCE PROCESSES

The air traffic services provider shall develop and maintain FRMS safety assurance processes to:

- 3.1 provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:
- a) hazard reporting and investigations;
 - b) audits and surveys; and
 - c) reviews and fatigue studies (both internal and external);
- 3.2 provide a formal process for the management of change. This shall include, but is not limited to:
- a) identification of changes in the operational environment that may affect the FRMS;
 - b) identification of changes within the organization that may affect the FRMS; and
 - c) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and
- 3.3 provide for the continuous improvement of the FRMS. This shall include, but is not limited to:
- a) the elimination and/or modification of preventive controls and recovery measures that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;

- b) routine evaluations of facilities, equipment, documentation and procedures; and
- c) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

4. FRMS PROMOTION PROCESSES

FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the air traffic service provider as part of its FRMS:

- 4.1 training programmes to ensure competency commensurate with the roles and responsibilities of management, air traffic controllers, and all other involved personnel under the planned FRMS; and
- 4.2 an effective FRMS communication plan that:
 - a) explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and
 - b) describes communication channels used to gather and disseminate FRMS-related information.

Appendix 7 STATE RESPONSIBILITIES CONCERNING AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE

(Chapter 2, 2.34 refers)

1. Maldives Airports Company Limited is the designated responsible entity for provision of Instrument Flight Procedure Design in Maldives. No other agency shall provide an IFPDS unless approved by the CAA.
2. The designated entity is responsible to design all instrument flight procedures for aerodromes and airspace.
3. Instrument flight procedures shall be designed in accordance with design criteria approved by the CAA
4. The designated instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace shall meet the requirements established in MCAR 173.
5. The designated instrument flight procedure design service provider utilizes a quality management system at each stage of the instrument flight procedure design process.
6. The designated instrument flight procedure design service provider shall maintain and periodically review instrument flight procedures for aerodromes and airspace.
7. The designated service provider shall establish an interval for periodic review of instrument flight procedures not exceeding five years.

ATTACHMENT A - MATERIAL RELATING TO A METHOD OF ESTABLISHING ATS ROUTES DEFINED BY VOR

(Chapter 2, 2.7.1 and 2.13 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.

- 1.2 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 passing or information available regarding the actual track-keeping performance of aircraft within a given portion of airspace should be taken into account.
- 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.
- 1.4 ICAO shall be fully informed of the results of the application of this guidance material.

2. DETERMINATION OF VOR SYSTEM PERFORMANCE VALUES

- 2.1 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 Annex 10, Volume I, 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.

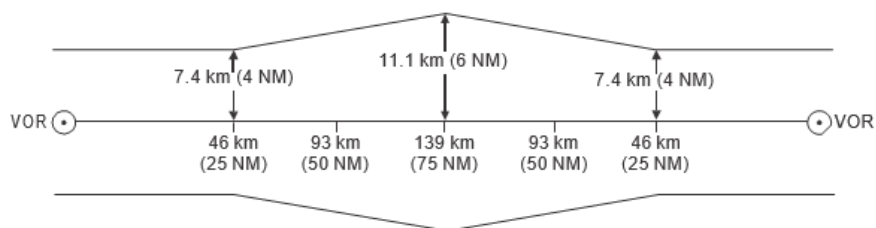


Figure A-1

- 3.4 If the Air Traffic service provider considers that a better protection is required, e.g. because of the proximity of prohibited, restricted or danger areas, climb or descent paths of military aircraft, etc., it may decide that a higher level of containment should be provided. For delineating the protected airspace, the following values should then 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.

	<i>Percentage containment</i>					
	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:

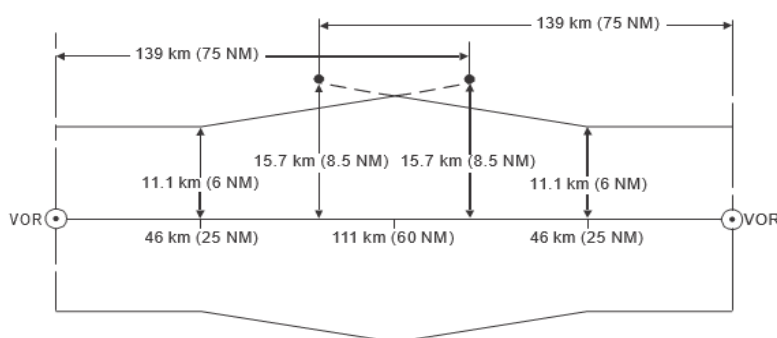


Figure A-2

- 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

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

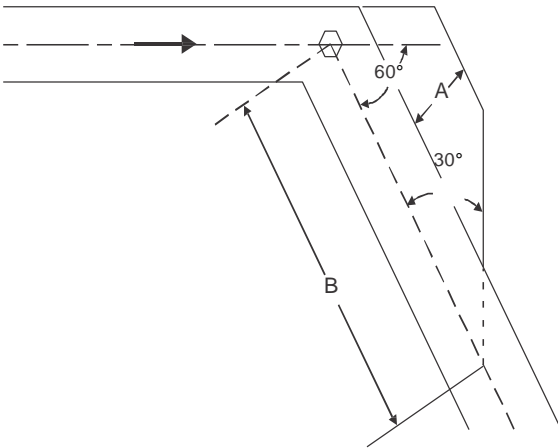


Figure A-3

3.9

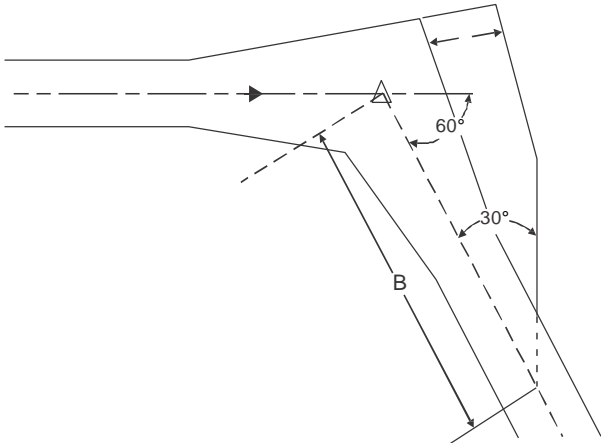
3.9 Figure A-4 illustrates the application for two segments meeting at a VOR intersection at an angle of 60 degrees beyond the point where boundary splay is required in order to comply with 3.3 and Figure A-1.

Figure A-4

3.10

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 kilometre/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,

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

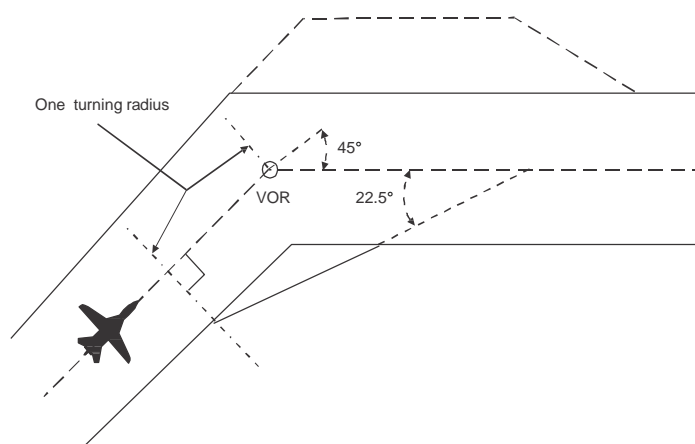


Figure A-5

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.

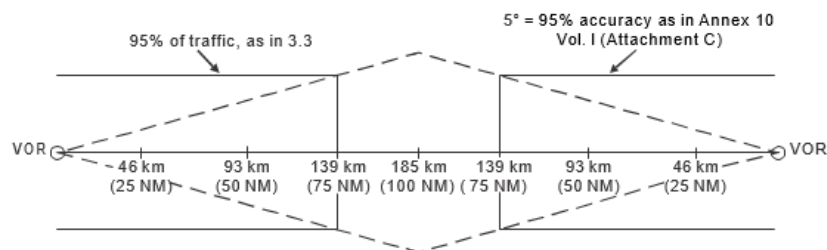


Figure A-6

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:
- 33.3 km (18 NM) for parallel routes where the aircraft on the routes fly in opposite direction; and
 - 30.6 km (16.5 NM) for parallel routes where the aircraft on the two routes fly in the same direction.

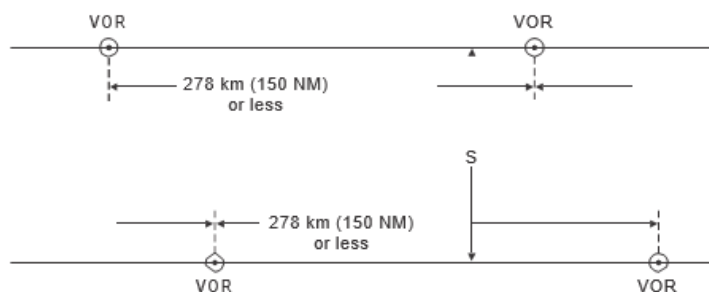


Figure A-7

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.

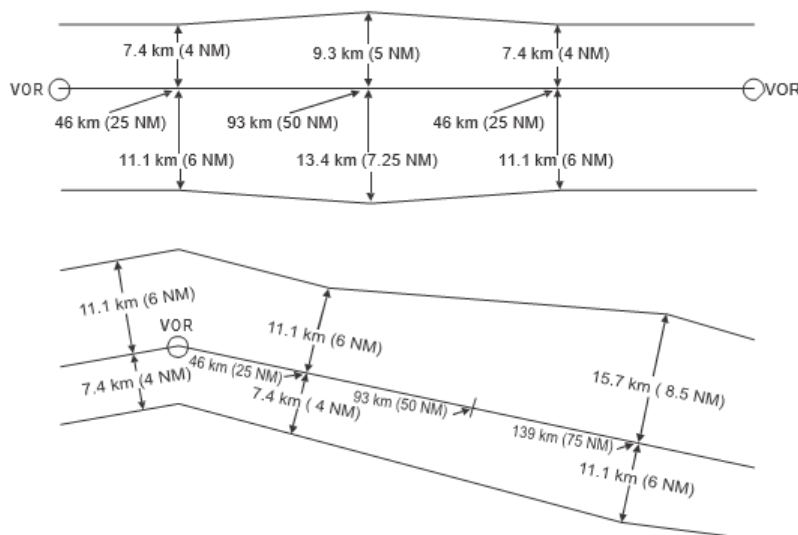


Figure A-8

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:

- 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 the Manual on Testing of Radio Navigation Aids (Doc 8071), Volume I);
- 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 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:

$$\text{Radius of turn} = (\text{Ground speed})^2$$

Constant 'G' x 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

(Chapter 4, 4.2.2, Note 2 refers)

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 The details on designated airspaces and the VHF RTF frequencies together with, the message formats and the procedures to be used shall be promulgated in AIP Maldives and/or through NOTAMs.

2. DETAILS OF BROADCASTS

2.1 VHF RTF FREQUENCY TO BE USED

- 2.1.1 In the case of temporary disruption occurring in controlled airspace, the designated VHF RTF frequency used normally for the provision of air traffic control service within that airspace may be used for TIBA.
- 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)

- 2.4.4 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 THE BROADCASTS

- 2.5.1 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.

- 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 a 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

1. STATUS OF CONTINGENCY PLANS

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 Air traffic services and related supporting services in particular portions of airspace is (are) also responsible, in the event of disruption or potential disruption of these services, for instituting measures to ensure the safety of international civil aviation operations and, where possible, for making provisions for alternative facilities and services. To that end the State(s) 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 plan 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 3.1, 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, States which anticipate or experience disruption of air traffic services and/or related supporting services should advise, as early as practicable, the ICAO Regional Office accredited to them, 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 Detailed coordination requirements should be determined as appropriate, In the case of contingency arrangements not appreciably affecting airspace users or service provided outside the airspace, coordination requirements are naturally few or non-existent.
- 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.