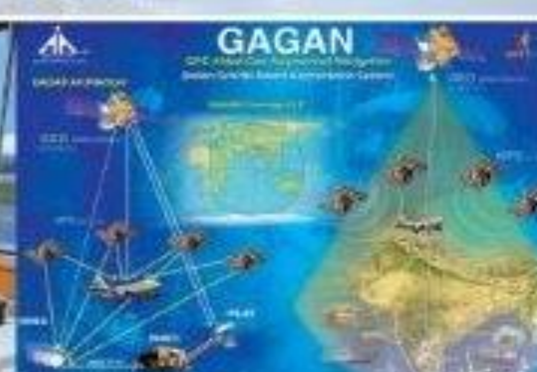
भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

MANUAL OF AIR TRAFFIC SERVICES
PART 1

Air Navigation Services

Fourth Edition- July 31,2015
ED/ATM/2015/V4.0-MATS-PRT1





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FOREWORD

Airports Authority of India provides air traffic services as per AAI Act 1995. These services comprise air traffic control service, advisory service, flight information service, and alerting service. In order to achieve the objectives of air traffic services, there is a need to standardise procedures necessary for the safety of air navigation which can be uniformly applied throughout India.

Maintaining the acceptable levels of safety calls for standardization and quality assurance in every sub system of Air Traffic System at one end and maintaining harmony with the ICAO standards and recommended practices at the other. This Manual of Air Traffic Services-Part I has been developed by ATM Directorate of Airports Authority of India to achieve this objective.

The purpose of this document is to establish procedures, provide information and instructions which are essential for the provision of safe and efficient air traffic services in the Indian administered airspace and at airports where air traffic services are provided by Airports Authority of India. It is published for use and guidance of its ATS personnel.

The ATS in-Charge of an ATC center will ensure that the provision of air traffic services are in accordance with the processes, procedures and instructions contained in this manual.

This manual fulfills the need for best practices in provision of Air Traffic Services according to international & national standards and recommended practices.

I, therefore, call upon all the AAI personnel engaged in the provisions of Air Traffic Services to comply with the standards, recommended practices and procedures given in this manual for providing safe and efficient air traffic services in the airspace under their jurisdiction.

(R K SRIVASTAVA)
July 21, 2015

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PREFACE

1) This Manual of Air Traffic Services (MATS) - Part 1 is prepared for the use and guidance of executives and staff of AAI. The Manual provides processes, procedures and instructions that are essential for the provision of safe and efficient air services within the airspaces under the jurisdiction of AAI and at airports where air traffic services are provided by Airports Authority of India.

2) This Manual has been developed as a part of comprehensive documentation of the ATS procedures, processes and facilities supporting conformance to organizational requirements and compliance with National Regulations and Standards & Recommended Practices of ICAO ANNEX 11, PANS - ATM DOC 4444 and other ICAO documents relevant to the provision of Air Traffic Services that are uniformly applicable to all the airports.

3) In addition to MATS - Part 1, airport specific Manuals of Air Traffic Services (MATS) - Part 2 have been developed by ATS-in-Charges of various airports, as part of the above mentioned documentation process. MATS - Part 2 contain information, guidance, procedures and instructions applicable to the ATS units of those particular airports and are maintained by ATS-in-Charges of the concerned airport.

4) Differences from ICAO Standards and Recommended Practices of ICAO Annex 11 are published in AIP India.

5) Where ever there is a difference between a Standard prescribed by ICAO and one in this Manual, the standard prescribed in this manual shall prevail.

6) This Manual should be read in conjunction with the following:

   (a) ICAO Annex 11 – Air Traffic Services

   (b) ICAO Annex 2 – Rules of the Air

(c) PANS-ATM Doc 4444 – Procedures for Air Navigation Services - Air Traffic Management

(d) Doc 7030 – Regional Supplementary Procedures

(e) Doc 9426 – Air Traffic Services Planning Manual

(f) Doc 9613 – Performance Based Navigation Manual

(g) Doc 9683 - Human Factor Training Manual

(h) Doc 9694 – Manual of Air Traffic Services Data Link Applications

(i) Manual on the Prevention of Runway Incursions (Doc 9870).

(j) Aeronautical Information Publication (AIP)-India

(k) Relevant DGCA CARs and Circulars

(l) Current Air Traffic Management Circulars (ATMCs)

(m) Manual of Air Traffic Services - Part 2 (Airport specific)

7) It is to be recognized that in the changing aviation safety environment, the need to amend the Manual may be necessitated by a number of causes, such as:

(a) Changes / amendments to ICAO Annexes / Documents.

(b) Changes / introduction of DGCA CARS and Circulars

(c) Introduction of new technology

(d) Requirements from ATS, Airlines or any other concerned agency

8) Fourth edition of the Manual is issued after updating it and incorporating amendments to PANS ATM DOC 4444/other ICAO documents, DGCA CARS/Circulars and relevant contents of some of the Air Traffic management Circulars (ATMCs) and is based on the basis of experience gained and comments/ suggestions received from the users of this Manual. Views, comments & suggestions for improvement of this edition, may be sent to the Executive Director (Air Traffic Management), Airports Authority of India, CHQ, New Delhi.

(V. SOMASUNDARAM)
MEMBER (Air Navigation Services)
14th July 2015.

AMEMDMENTS

RECORDS OF AMENDMENTS AND CORRIGENDA

AMENDMENTS/CORRIGENDA			
No.	Date Applicable	Date Entered	Entered by
Corr-1	20-October 2016	19-October 2016	SQMS Section, CHQ
Amd-1	20-October 2016	19-October 2016	SQMS Section, CHQ
Amd-2	10- November 2016	19-October 2016	SQMS Section, CHQ
Corr-2	15-August 2017	15-August 2017	SQMS Section, CHQ
Amd-3	15-August 2017	15-August 2017	SQMS Section, CHQ
Corr-3	05-October 2018	16-October 2018	SQMS Section, CHQ
Amd-4	06-October 2018	16-October 2018	SQMS Section, CHQ
Amd-5	06-October 2018	08-November 2018	SQMS Section, CHQ

CHAPTER 1

DOCUMENT IDENTIFICATION AND CONTROL

1.1 Title of the document:

1.1.1 This document is identified as Manual of Air Traffic Services- Part 1 (MATS-Part 1)

1.2 Purpose of this chapter:

1.2.1 This chapter details the procedures for writing, approving, controlling and amending documentation in MATS- Part 1

1.3 Purpose of the document:

1.3.1 The purpose of this document is to establish procedures, provide information and instructions which are essential for the provision of safe and efficient air traffic services at airports where air traffic services are provided by Airports Authority of India. It is published for use and guidance of its ATS personnel.

1.3.2 The ATS in-charge of an ATC center will ensure that the provision of air traffic services under his jurisdiction are provided in compliance with the processes, procedures and instructions contained in this manual.

1.4 Responsibility for documentation and publication:

1.4.1 This Manual of Air Traffic Services- Part 1 has been prepared by Executive Director (Air Traffic Management), endorsed by Member (ANS) and finally approved by the Chairman, AAI. The ED (ATM) is responsible to publish and maintain this Manual on behalf of the Chairman.

1.4.2 The Executive Director (Air Traffic Management), AAI will ensure that the provisions of air traffic services as detailed in this manual are in conformance with the regulatory provisions on air traffic services contained in the Annexes to the Convention on International Civil Aviation, & various ICAO Documents relevant to the provision of Air Traffic Services and also to the National Regulations as applicable in India.

1.5 Authority/responsibility for Changes

1.5.1 The Executive Director (Air Traffic Management), AAI is responsible for incorporating amendments to the MATS - Part 1.

1.5.2 Holders of hard-copies of MATS - Part 1 are responsible for ensuring that the Manual is kept up to date. This includes inserting new chapters or chapter amendments in a timely manner and complying with any instructions on amendment advice.

1.5.3 The user of MATS- Part 1 will be responsible for verifying the currency of documentation in the Manual.

1.6 Review

1.6.1 The General Manager (Standards, Quality management & Safety) will conduct a yearly review of this Manual to ensure accuracy and updating of all its contents and reference data. The results of such audit and action taken thereupon will be documented and presented to Executive Director (ATM) for his approval.

1.6.2 Incorporating Changes: The General Manager (SQMS) on behalf of the Executive Director (ATM) will ensure that the:

- changes being incorporated are duly approved by the competent authority,
- relevant pages in the Manual are revised
- amendments are posted on AAI's web site
- Amendment / advice is issued in time to all concerned in respect of new chapter(s) and the same is inserted in the Manual.
- master- copy of the Manual is updated

1.7 Interpretation of Words:

1.7.1 To avoid any misunderstanding within the MATS - Part 1, certain words in this document are to be interpreted as having specific meanings as given in Table 1-1, when they are the operative words in an instruction.

Words	*Meanings*
'shall', 'is to', 'are to' and 'must'	The instruction is mandatory
'will'	It is only used for informative or descriptive writing, e.g. 'pilots will file . . . . . ' is not an instruction to the controller
'may'	It means that the instruction is permissive, optional or alternative, e.g. 'a controller may seek assistance . . . . . ' but would not if he did not need it.
'should'	It means that it is strongly advisable that an instruction is carried out; it is recommended or discretionary. It is applied where the more positive 'shall' is unreasonable but nevertheless a controller would have to have a good reason for not doing so.
'miles'	It always refers to nautical miles

Table 1-1: Interpreted Meaning of certain words used in the document

1.7.2 In the interests of simplicity, any reference to the masculine gender can be taken to mean either male or female.

1.8 Effective Date:

1.8.1 Effective date of an instruction is indicated at the foot of the page.

1.8.2 New edition will be indicated by date at the foot of the page.

1.9 Change History:

1.9.1 This is fourth edition of the MATS - Part 1. Subsequent changes will be indicated on 'Record of Amendments and Corrigenda' page.

1.10 Format

1.10.1 Amendment-documentation being inserted in the manual must contain headers and footers that are consistent with those residing in this document.

1.11 Controlling the Manual

1.11.1 Directorate of Air Traffic Management will control this Manual electronically through AAI web site www.aaians.org and www.aai.aero

1.12 Distribution of the Manual

1.12.1 Directorate of Air Traffic Management, CHQ will not provide hard copies of the document. All ATS in-charge shall print, control and distribute hard copies of the document, as deemed appropriate.

1.13 Master Copy

1.13.1 An electronic and a paper format Master Copy of the Manual will be held and maintained by the ATM Directorate at CHQ.

1.14 Checking Currency of the Manual

1.14.1 A current copy of the Manual will be published on Airports Authority of India web site: www.aaians.org and www.aai.aero.

1.15 Enquiries

1.15.1 Enquiries / clarifications / suggestions, if any, should be addressed to:

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CHAPTER 2

DEFINITIONS

When the following terms are used in context of instructions and application of MATS Part1, they have the following meanings:

A

Accepting unit/controller. Air Traffic Control Unit/ Air Traffic Controller next to take control of an aircraft.

Accident. An occurrence associated with the operation of an aircraft which,

i. in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or

ii. in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

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

— being in the aircraft, or

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

— direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) The aircraft sustains damage or structural failure which:

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

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

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

c) The aircraft is missing or is completely inaccessible.

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

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

Note 3 — For the purpose of this clause, the guidance for the determination of aircraft damage is at Schedule B of Rule 2 (a) of Aircraft (Investigation of Accidents and Incidents) Rules, 2012

Note 4 — For the purpose of this clause, only unmanned aircraft which have design or operational approval given by a State to be considered.

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

Note. — For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

Acknowledgement. Notification that a given communication has been correctly received and understood.

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

Note. — The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

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

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

Note.— Air traffic control service provides a much more complete service than air traffic advisory service; advisory areas and routes are therefore not established within controlled airspace, but air traffic advisory service may be provided below and above control areas.

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

Note. — The term "aerodrome" where used in the provisions relating to flight plans and ATS messages is intended to cover also sites other than aerodromes which may be used by certain types of aircraft, e.g. helicopters or balloons.

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

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

Aerodrome elevation. The elevation of the highest point of the landing area.

Aerodrome operating minima. The limits of usability of an aerodrome for:

a) take-off, expressed in terms of runway visual range and / or visibility and, if necessary, cloud conditions;

b) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range; minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and

c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) appropriate to the type and/or category of the operation.

d) Aerodrome operating minima for Airports shall be established by the Airline/Aircraft operators on the OCA/OCH or DA/DH and ALS facility published by AAI.

e) The adherence to the minima is the responsibility of pilot in command. However, ATC is responsible to pass the latest meteorological information and status of aeronautical ground lights and other related facilities at the airport to the pilot in command, including any significant changes.

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

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

Aerodrome traffic circuit. The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

Aerodrome traffic zone. An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.

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

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

Aeronautical ground light. Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

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

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

Aeronautical station. A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

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

AFIL. An alpha character group used to designate an air-filed flight plan.

Airborne Collision Avoidance System (ACAS). An aircraft system based on secondary surveillance radar (SSR) transponder signals which operate independently of ground based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircraft address. A unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

Aircraft identification. A group of letters, figures or a combination thereof which is either identical to, or the coded equivalent of, the aircraft call sign to be used in air ground communications, and which is used to identify the aircraft in ground-ground air traffic services communications.

Aircraft observation. The evaluation of one or more meteorological elements made from an aircraft in flight.

Aircraft proximity. A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. An aircraft proximity is classified as follows:

Risk of collision. The risk classification of an aircraft proximity in which serious risk of collision has existed.

Safety not assured. The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised.

No risk of collision. The risk classification of an aircraft proximity in which no risk of collision has existed.

Risk not determined. The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

Air-filed flight plan (AFIL). A flight plan provided to an air traffic services unit by an aircraft during its flight.

Air-ground communication. Two-way communication between aircraft and stations or locations on the surface of the earth.

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

AIRPROX. The code word used in an air traffic incident report to designate aircraft proximity.

Air-report. A report from an aircraft in flight prepared in conformity with requirements for position and operational and/or meteorological reporting.

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

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

Air-to-ground communication. One-way communication from aircraft to stations or locations on the surface of the earth.

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

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

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

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

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

Air traffic control instruction. Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action.

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

a) preventing collisions:

  i) between aircraft, and

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

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

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

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

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

Air traffic management system. A system that provides ATM through the collaborative integration of humans, information, technology, facilities and services, supported by air and ground- and/or space-based communications, navigation and surveillance.

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

Air traffic services airspaces. Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified. *Note.— ATS airspaces are classified as Class A to G*

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

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

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

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

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

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

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

Allocation, allocate. Distribution of frequencies, SSR Codes, etc. to a State, unit or service. Distribution of 24-bit aircraft addresses to a State or common mark registering authority.

Alphanumeric characters (alphanumerics). A collective term for letters and figures (digits)

Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

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

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

ETOPS en-route alternate. A suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shut-down or other abnormal or emergency condition while en route in an ETOPS operation.

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

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

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

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

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

Approach sequence. The order in which two or more aircraft are cleared to approach to land at the aerodrome.

Appropriate ATS authority. The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Appropriate authority.

a) Regarding flight over the high seas: The relevant authority of the State of Registry.
b) Regarding flight other than over the high seas: The relevant authority of the State having sovereignty over the territory being over flown.

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

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

Area Control Centre (ACC). A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

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

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

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

Assignment, assign. Distribution of frequencies to stations. Distribution of SSR Codes or 24-bit aircraft addresses to aircraft.

ATIS. The symbol used to designate automatic terminal information service.

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

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

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

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

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

Note.- A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

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

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

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

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

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

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

B

Base turn. A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

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

Blind transmission. A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

Broadcast. A transmission of information relating to air navigation that is not addressed to a specific station or stations.

C

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

Ceiling. The height above the ground or water of the base of the lowest layer of cloud below 20 000 ft covering more than half the sky.

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

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

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

Clearance void time. A time specified by an air traffic control unit at which a clearance ceases to be valid unless the aircraft concerned has already taken action to comply therewith.

Code (SSR). The number assigned to a particular multiple pulse reply signal transmitted by a transponder in Mode A or Mode C.

Common Point. A point on the surface of the earth common to the tracks of two aircraft, used as a basis for the application of separation (e.g., significant point, waypoint, navigation aid, fix).

Note.— Common point is not used for operational purposes or in pilot/controller communications.

Computer. A device which performs sequences of arithmetical and logical steps upon data without human intervention.

Note.— When the word "computer" is used in this document it may denote a computer complex, which includes one or more computers and peripheral equipment.

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

Contact point. A specified position, time or level at which an aircraft is required to establish radio communication with an air traffic control unit.

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

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

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

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

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

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

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

Control sector. A subdivision of a designated control area within which responsibility is assigned to one controller or to a small group of controllers.

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

Converted Meteorological Visibility(CVM): A value equivalent to an RVR which is derived from the reported meteorological visibility, as converted in accordance with the specified requirement in the CAR.

a. The privilege of CMV as stipulated in the AWO CAR can be availed by the plot in command when:
   i) RVR is not available
   ii) Or RVR is not reported

iii) Reported visibility is 800M or above
iv) Minimum length of approach lighting system is 420M or more

Co-ordination. The process of obtaining agreement on clearances, transfer of control, advice or information to be issued to aircraft, by means of information exchanged between air traffic services units or between controller positions within such units.

CPDLC message. Information exchanged between an airborne system and its ground counterpart. A CPDLC message consists of a single message element or a combination of message elements conveyed in a single transmission by the initiator.

CPDLC message set. A list of standard message element and free text message elements.

Cruise climb. An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

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

Current data authority. The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place.

Current flight plan (CPL). The flight plan, including changes, if any, brought about by subsequent clearances.

Note.— When the word "message" is used as a suffix to this term, it denotes the content and format of the current flight plan data sent from one unit to another.

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

D

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

Data convention. An agreed set of rules governing the manner or sequence in which a set of data may be combined into a meaningful communication.

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

Data link initiation capability (DLIC). A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications.

Data processing. A systematic sequence of operations performed on data.

Note.— Examples of operations are the merging, sorting, computing or any other transformation or rearrangement with the object of extracting or revising information, or of altering the representation of information.

Data quality. A degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution and integrity.

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

Decision altitude (DA) or decision height (DH). A specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1.— Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

Note 3.— For convenience where both expressions are used they may be written in the form "decision altitude/ height" and abbreviated "DA/H".

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

Dependent parallel approaches. Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.

DETRESFA. The code word used to designate a distress phase.

Discrete code. A four-digit SSR Code with the last two digits not being "00".

Distress phase. A situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

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

E

Elevation. The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

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

Estimated elapsed time. The estimated time required to proceed from one significant point to another.

Estimated off-block time. The estimated time at which the aircraft will commence movement associated with departure.

Estimated time of arrival. For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

Expected approach time. The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing.

Note.— The actual time of leaving the holding fix will depend upon the approach clearance.

F

Filed flight plan (FPL). The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes.

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

Final approach. That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or

b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:

1) a landing can be made; or

2) a missed approach procedure is initiated.

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

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

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

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

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

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

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

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

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

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

Flight path monitoring. The use of ATS surveillance system for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from the terms of their air traffic control clearances.

Note.- Some applications may require a specific technology e.g. radar, to support the function of flight path monitoring.

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.
Note.— Specifications for flight plans are contained in Annex 2. A Model Flight Plan Form is contained in Appendix 2 to PANS-ATM.

Flight progress board. A board designed and used for the tabular display of flight data.

Flight progress display. A display of data from which the actual and intended progress of flights may be readily determined.

Flight progress strip. Strip used for the display of flight data on a flight progress board.

Flight visibility. The visibility forward from the cockpit of an aircraft in flight.

Flow control. Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome, so as to ensure the most effective utilization of the airspace.

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

Free text message element. Part of a message that does not conform to any standard message element in the PANS-ATM (Doc 4444).

G

Garbling. The degradation of code information due to the simultaneous presence in a decoder of overlapping reply pulse trains.

Geodetic datum. A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame. ***Glide path.*** A descent profile determined for vertical guidance during a final approach.

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO19108).

Ground effect. A condition of improved performance (lift) due to the interference of the surface with the airflow pattern of the rotor system when a helicopter or other VTOL aircraft is operating near the ground.

Note.— Rotor efficiency is increased by ground effect to a height of about one rotor diameter for most helicopters.

Ground visibility. The visibility at an aerodrome, as reported by an accredited observer or by automatic systems.

H

Heading. The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

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

Holding fix. A geographical location that serves as a reference for a holding procedure.

Holding procedure. A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.

Hot spot. A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

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

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

I

Identification. The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified.

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

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

IMC. The symbol used to designate instrument meteorological conditions.

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

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

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

Independent parallel approaches. Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

Independent parallel departures. Simultaneous departures from parallel or near-parallel instrument runways.

Initial approach segment. That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

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

Instrument approach operations. An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note.— Lateral and vertical navigation guidance refers to the guidance provided either by:

a) a ground-based radio navigation aid; or

b) computer-generated navigation data from ground-based, space-based, selfcontained navigation aids or a combination of these.

Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

Note.— Non-precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory VNAV guidance calculated by on-board equipment (see PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.8.1) are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraphs 1.7 and 1.8.

Approach procedure with vertical guidance (APV). A Performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

Precision approach (PA) procedure. An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS cat I) designed for 3D instrument approach operations Type A or B.

Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and

b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:

1) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

2) Category II (CAT II): a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m;

3) Category IIIA (CAT IIIA): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range not less than 175 m;

4) Category IIIB (CAT IIIB): a decision height lower than 15 m (50 ft) or no decision height and a runway visual range less than 175 m but not less than 50 m; and

5) Category IIIC (CAT IIIC): no decision height and no runway visual range limitations.

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

Note 1.— The specified minima for visual meteorological conditions are contained in Chapter 3 of Annex 2.

Note 2.— In a control zone, a VFR flight may proceed under instrument meteorological conditions if and as authorized by air traffic control.

Integrity (aeronautical data). A degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

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

L

Landing area. That part of a movement area intended for the landing or take-off of aircraft.

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

Location indicator. A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

Logon address. A specified code used for data link logon to an ATS unit.

Low Visibility Take off operations(LVTO). A term used in relation to flight operations referring to a take-off on runway where the RVR is less than 400M.

a. As per AWO CAR, An operator shall not conduct take off with RVR/visibility less than standard Category I conditions of 550M RVR /800m visibility unless low visibility procedures are enforced. This provision requires promulgation of Low Visibility Procedures by Airport operators for permitting departures in visibility/RVR less than 800M/550M at such airports where there are NO CAT II and CAT III operations.

M

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

Meteorological information. Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

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

Meteorological report. A statement of observed meteorological conditions related to a specified time and location.

Minimum fuel. The term used to describe a situation in which an aircraft's fuel supply has reached a state where the flight is committed to land at a specific aerodrome and no additional delay can be accepted.

Note.— This is not an emergency situation but merely indicates that an emergency situation is possible, should any undue delay occur.

Missed approach procedure. The procedure to be followed if the approach cannot be continued.

Mode (SSR). The conventional identifier related to specific functions of the interrogation signals transmitted by an SSR interrogator. There are four modes specified in Annex 10: A, C, S and intermode.

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

Multilateration (MLAT) system. A group of equipment configured to provide position derived from the secondary surveillance radar (SSR) transponder signals (replies or squitters) primarily using time difference of arrival (TDOA) techniques. Additional information, including identification, can be extracted from the received signals.

N

Near-parallel runways. Non-intersecting runways whose extended centre lines have an angle of convergence/ divergence of 15 degrees or less.

Next data authority. The ground system so designated by the current data authority through which an onward transfer of communications and control can take place.

Normal operating zone (NOZ). Airspace of defined dimensions extending to either side of an ILS localizer course and/or MLS final approach track. Only the inner half of the normal operating zone is taken into account in independent parallel approaches.

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

No transgression zone (NTZ). In the context of independent parallel approaches, a corridor of airspace of defined dimensions located centrally between the two extended runway centre lines, where a penetration by an aircraft requires a controller intervention to manoeuvre any threatened aircraft on the adjacent approach.

O

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

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

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH). The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1.— Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

Note 2.— For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

Operational control. *The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.*

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

Note.- In the context of remotely piloted aircraft, an aircraft operation includes the remotely piloted aircraft system

P

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

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

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

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

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

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

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

Position indication. The visual indication, in non-symbolic and/or symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle or other object.

Position symbol. The visual indication in symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle or other object, obtained after automatic processing of positional data, derived from any source.

Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.* ***Primary radar.*** A radar system which uses reflected radio signals.

Primary surveillance radar (PSR). A surveillance radar system which uses reflected radio signals.

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

Procedural control. Term used to indicate that information derived from an ATS surveillance system is not required for the provision of air traffic control service.

Procedural separation. The separation used when providing procedural control.

Procedure turn. A manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

Note 1.— Procedure turns are designated "left" or "right" according to the direction of the initial turn.

Note 2.— Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.

Profile. The orthogonal projection of a flight path or portion thereof on the vertical surface containing the nominal track.

PSR blip. The visual indication, in non-symbolic form, on a situation display of the position of an aircraft obtained by primary radar.

R

Radar. A radio detection device which provides information on range, azimuth and/or elevation of objects.

Radar approach. An approach in which the final approach phase is executed under the direction of a controller using radar.

Radar clutter. The visual indication on a situation display of unwanted signals.

Radar contact. The situation which exists when the radar position of a particular aircraft is seen and identified on a situation display.

Radar echo. The visual indication on a radar display of a radar signal reflected from an object.

Radar separation. The separation used when aircraft position information is derived from radar sources.

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

Receiving unit/controller. Air traffic services unit/air traffic controller to which a message is sent.

Release time. Time prior to which an aircraft should be given further clearance or prior to which it should not proceed in case of radio failure.

Repetitive flight plan (RPL). A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.

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

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

Required navigation performance (RNP). A statement of the navigation performance necessary for operation within a defined airspace.

Note.— Navigation performance and requirements are defined for a particular RNP type and/or application.

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

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

Rescue unit. A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue.

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

RNP type. A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 per cent of the total flying time.

Example.— RNP 4 represents a navigation accuracy of plus or minus 7.4 km (4 NM) on a 95 per cent containment basis.

Route description. The unambiguous delineation of a route in terms of an ordered sequence of ATS route designators and/or significant points.

Route segment. A portion of a route to be flown, as defined by two consecutive significant points specified in a flight plan.

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

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

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

Runway incursion. Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designed for the landing and take-off of aircraft.

Runway visual range (RVR). The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

S

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

Secondary radar. A radar system wherein a radio signal transmitted from the radar station initiates the transmission of a radio signal from another station.

Secondary surveillance radar (SSR). A surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

Segregated parallel operations. Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.

Sending unit/controller. Air traffic services unit/air traffic controller transmitting a message.

Serious incident. Serious incident means an incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, –

(i) in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or

(ii) in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at

the end of the flight and the primary propulsion system is shut down;

Note.— The examples of serious incident are as specified in 3.18.1.6 of Chapter 3 of this manual.

Shoreline. A line following the general contour of the shore, except that in cases of inlets or bays less than 30 nautical miles in width, the line shall pass directly across the inlet or bay to intersect the general contour on the opposite side.

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

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

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

Situation display. An electronic display depicting the position and movement of aircraft and other information as required.

Slush. Water-saturated snow which with a heel-and-toe slapdown motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

Note.— Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.

Snow (on the ground)

a) Dry snow. Snow which can be blown if loose or, if compacted by hand, will fall apart upon release; specific gravity: up to but not including 0.35.

b) Wet snow. Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.

c) Compacted snow. Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.

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

SSR response. The visual indication, in non-symbolic form, on a situation display, of a response from an SSR transponder in reply to an interrogation.

Standard instrument arrival (STAR). A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

Standard instrument departure (SID). A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.

Standard message element. Part of a message defined in the PANS-ATM (Doc 4444) in terms of display format, intended use and attributes.

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

Stopway. A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

Surveillance radar. Radar equipment used to determine the position of an aircraft in range and azimuth.

Synthetic display. A display of computer-generated information, normally comprising aircraft positions and associated data presented in alphanumeric or symbolic form.

T

Tabular display. A display of information in the form of a table.

Target. In radar,

1) generally, any discrete object which reflects or retransmits energy back to the radar equipment;
2) specifically, an object of radar search or surveillance.

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

Taxiway. A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

a) *Aircraft stand taxilane*. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

b) *Apron taxiway*. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.

c) *Rapid exit taxiway*. A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

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

Threshold. The beginning of that portion of the runway usable for landing.

Time difference of arrival (TDOA). The difference in relative time that a transponder signal from the same aircraft (or ground vehicle) is received at different receivers.

Total estimated elapsed time. For IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome.

Touchdown. The point where the nominal glide path intercepts the runway.

Note.— "Touchdown" as defined above is only a datum and is not necessarily the actual point at which the aircraft will touch the runway.

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

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

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

Transfer of control point. A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.

Transferring unit/controller. Air traffic control unit/air traffic controller in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit/air traffic controller along the route of flight.

Transition altitude. The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

Transition layer. The airspace between the transition altitude and the transition level.

Transition level. The lowest flight level available for use above the transition altitude.

U

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

Unlimited route concept. A concept of controlled airspace organization which allows an operator complete freedom to choose the route to be taken by a flight from one point to another provided that the route is adequately defined in the flight plan and adhered to as accurately as circumstances permit.

Unmanned free balloon. A non-power-driven, unmanned, lighter-than-air aircraft in free flight.

Note.— Unmanned free balloons are classified as heavy, medium or light in accordance with specifications contained in Annex 2, Appendix 4.

V

Vectoring. Provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.

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

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

Visibility. Visibility for aeronautical purposes is the greater of:

a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;

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

Note1.— The two distances have different values in air of a given extinction coefficient, and the latter b) varies with the background illumination. The former a) is represented by the meteorological optical range (MOR).

Note 2.— The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.

Visual approach. An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

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

Note.— The specified minima are contained in Annex 2, Chapter 4.

VMC. The symbol used to designate visual meteorological conditions.

W

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

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

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

CHAPTER 3

GENERAL

3.1 ORGANIZATIONAL STRUCTURE AND FUNCTIONS

3.1.1 Airports Authority of India

3.1.1.1 Airports Authority of India (AAI) was constituted by an Act of Parliament and came into being on 1st April 1995 by merging erstwhile National Airports Authority and International Airports Authority of India. The merger brought into existence a single Organization entrusted with the responsibility of creating, upgrading, maintaining and managing civil aviation infrastructure both on the ground and air space in the country. It is governed by a Board of Directors, consisting of whole time members, as well as part-time members, appointed by the Government of India.

3.1.1.2 AAI website **www.airportsindia.org.in** and **www.aai.aero** provide details of the organizational structure of AAI

3.1.1.3 Postal and telegraphic address

Airports Authority of India,

Rajiv Gandhi Bhawan,

Safdarjung airport,

New Delhi – 110003

Telephone: 011- 24632950

Fax: 011- 24641088

AFS VIDDYXAC

3.1.2 Functions of Airports Authority of India and ATM Directorate

3.1.2.1 Various functions of Airports Authority of India are listed in Chapter III of the AAI ACT, 1994

3.1.2.2 Provision of air traffic management services is one of the essential functions of AAI. This function is carried out under the direction and control of Member (ANS), who is a whole time Board Member of AAI. The Executive Director (ATM), reporting to Member (ANS), is the head of ATM Directorate. The ATS in-charges are responsible to supervise the provision of ATS at their respective stations and report to the Regional Executive Directors of the region concerned.

3.2 ROLES AND RESPONSIBILITIES OF AIR TRAFFIC MANAGEMENT DIRECTORATE

3.2.1 ATM Directorate is responsible for the dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

3.2.2 The ATM directorate at AAI Corporate Headquarters oversees corporate strategy, development of processes and procedures for safety and uniformity in the provision of air traffic services, strategic supervision of the provision of air traffic services, training and rating of air traffic controllers, including refresher training, coordination with other concerned organizations in and outside India. The ATM directorate has also been assigned the responsibilities related to the provision of Aeronautical Information Services, Cartography Services and Search & Rescue Services.

3.3 OPERATIONAL SUPERVISION

3.3.1 The dynamic application of supervision of air traffic services rests with the ATS In-charges at their respective stations where ATC centres are established for the provision of air traffic services. The ATS In-Charges also receive technical and administrative support and guidance from the regional units in each FIRs as published in Aeronautical Information Publications (AIP).

3.4 ATM STAFFING

3.4.1 The ATM Directorate is responsible to determine the operational (ATM) staffing requirements for the country as a whole for staff planning purposes. The staff requirements are worked out taking into account:

a) ATS requirements based on assessment of traffic levels and airspace complexities;

b) Number of operational shifts to be operated;

c) Fatigue management;

d) Training including refresher training needs;

e) Leave requirements.

3.5 STRESS/FATIGUE MITIGATION OF ATCOS – REST & RELIEF

3.5.1 Fatigue is defined as a mental weariness resulting from exertion. Fatigue can be mental or physical and can manifest as either somnolence (decreased wakefulness) or as a general decrease in attention. Fatigue can cause problems for individuals who perform tasks that require constant concentration, such as air traffic control. Additionally, the nature of air traffic control requires shift work, which can exacerbate fatigue because it often requires individuals to work at times when they would normally be sleeping or sleep at times when they would normally be awake.

3.5.1 **Rest and relief**

3.5.1.1 Each station should ensure provision of adequate rest and relief mechanisms which need to be standardized including size of the rest room, number of beds to be made available, facilities such as television, water dispensers with provision of both hot and cold water, refrigerators, microwave ovens, massage chairs, reclining chairs, Library facilities with both aviation subject and general materials, a well-equipped gym, individual storage locker facility etc.

3.5.1.2 The period on operational position (ATC Channel) should be adjusted to avoid the performance degradation considering the volume and complexity. WSO/ Supervisors of units shall ensure proper relief of the controllers who are working on channel.

3.5.1.3 No operational duty shall exceed a period of two hours without there being taken at the end of that period a break/relief of 30 minutes except for supervisory positions and non ATC positions viz., EEP, DEP, ARO, FIC, AIS etc. However, this period can be extended at airports with lean air traffic.

3.5.1.4 Periods of operational duty between 2300 hrs IST to 0600 hrs IST during night shift may be extended to a maximum of four hours before relief is provided. This relief period may be of longer duration.

3.5.1.5 The duty period along with relief period of ATCOs shall be mentioned in the roster by ATS in-charge.

3.5.2 Position Rotation

3.5.2.1 All airports/ATC centres to establish procedures to rotate controllers through challenging and less demanding positions during each shift to mitigate the potential for fatigue to occur.

3.5.3 Interval between Period of Duty

3.5.3.1 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.

3.5.4 Other Stress/Fatigue relieving measures

3.5.4.1 Arrangement may be made for controllers to be trained in stress relieving mechanisms such as Yoga, Meditation etc at regular interval by station in-charge

3.6 PROVISION OF AIR TRAFFIC SERVICES

3.6.1 With the exception of certain military areas, state, military and private aerodromes, the Air Traffic Services are provided for the entire airspace over Indian Territory including territorial waters as well as high seas encompassed by Kolkata, Chennai and Mumbai Flight Information Regions. This airspace covers approximately 2.8 million sq. NM.

3.6.2 The need for the provision of air traffic services has been determined by consideration of the following:

a) the types of air traffic involved;

b) the density of air traffic;

c) the meteorological conditions.

3.6.3 Flight Information Centres (FICs) have been established at Delhi, Mumbai, Kolkata, Chennai and Guwahati as per specifications given in para 2.10 of DGCA CAR Section 9 Series 'E' Part 1 to provide flight information service and alerting service within airspace jurisdiction of the FIRs designated as Delhi FIR, Mumbai FIR, Kolkata FIR, Chennai FIR, and Guwahati Sub-FIR respectively.

3.6.4 Those portions of the airspace where it has been determined that air traffic control service will be provided to IFR flights have been designated as control areas or control zones as detailed in AIP India.

3.6.5 Those portions of the airspace where it has been determined that air traffic control service will be provided to VFR flights also; are published in AIP India. Such portions of the airspace may be class B, C or D airspace.

3.6.6 The control areas and control zones within a Flight Information Region form part of that Flight Information Region. These control areas and control zones have been designed as per specifications given in paras 2.10.3, 2.10.4 and 2.10.5 of DGCA CAR Section 9 Series 'E' Part I.

3.6.7 Air traffic control units have been established to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

3.6.8 Air traffic control service is provided to aerodrome traffic at the aerodromes as notified in AIP India and accordingly these have been designated as controlled aerodromes.

3.6.9 The hours of operations of air traffic services or ATC units are published in the AIP India. Any changes or amendments are notified by NOTAM and subsequently, through AIP amendment.

3.6.10 Aerodrome control service provided by AAI at the controlled aerodromes is limited to airspace in the vicinity of the aerodrome & the manoeuvring area of the aerodrome, which consist of all operational runways and taxiways but does not include apron.

3.6.11 The movement of persons or vehicles including towed aircraft on the manoeuvring area of an aerodrome is controlled by the aerodrome control tower as necessary to avoid hazard to them or to aircraft landing, taxiing or taking off.

3.6.12 Apron management service at some of the aerodromes is provided by a separate Apron Control unit.

3.6.13 Flight information centers and area control centres have been identified by the names of nearby towns / cities. Aerodrome control towers and approach control units have also been identified by the names of the nearby towns / cities except that where more than one aerodromes are located near a city, the aerodrome control tower at the smaller aerodrome in the city, has been identified by the name of its location..

3.6.14 The control zones, control areas and flight information regions have been identified by the names of the units having jurisdiction over such airspaces.

3.6.15 ATS routes have been published in AIP. These routes have been identified, established and designated as per provisions under para 2.12 of DGCA CAR Section 9 Series 'E' Part I.

3.6. 16 The summary of the Air Traffic Services provided by each ATC unit, including airspace classification, airspace designation, airspace jurisdiction, hours of operation and the type of service, is published in the AIP India. The relevant maps and charts are published in the AIP.

3.7 SEARCH AND RESCUE

3.7.1 Responsible Authority

3.7.1.1 Ministry of Civil Aviation is responsible for SAR policy in India for Civil Aviation.

3.7.1.2 SAR services are provided

i. over land areas by the National Aeronautical Search and Rescue Co-ordination Committee (NASARCC) with Secretary, Ministry of Civil Aviation as its Chairman, and

ii. over oceanic areas by the National Maritime SAR Board (NMSARB) with Director General, Indian Coast Guard as its Chairman.

3.7.1.3 Airports Authority of India is responsible for establishment and provision of search and rescue services in coordination with Ministry of Defence and other agencies to ensure that assistance is rendered to persons in distress. Such services are provided on a 24-hour basis.

3.7.2 Area of Responsibility

3.7.2.1 The Indian Search and Rescue Region (SRR)

3.7.2.1.1 The boundary of Indian Aeronautical SRR coincides with Indian FIR boundary, excluding the portion of FIR over the sovereign territory of Kingdom of

Bhutan. The Indian SRR comprises Delhi, Mumbai, Kolkata and Chennai FIRs. FIR boundary coordinates are published in ENR 2.1 of eAIP India. A Map showing Indian FIR boundaries and Indian SRR boundaries are shown in figure 3-1.

3.7.2.2 Type of Service

3.7.2.2.1 Search and rescue services are provided within the entire Indian Search and Rescue Regions. There are four Rescue Coordination Centres (RCC) at Delhi, Mumbai, Kolkata, Chennai and one Rescue Sub Centre at Guwahati established in India.

3.7.2.2.2 There are three Maritime Rescue coordination Centres (MRCCs) in India at Mumbai, Chennai and Port Blair and thirteen Maritime Rescue Sub Centres at Goa, Kochi, New Mangalore, Okha, Porbandar and Vadinar in Mumbai MRCC; Haldia, Mandapam, Paradip, Tuticorin and Vishakahapatnam in Chennai MRCC; Campbell Bay and Diglipur in Port Blair MRCC. A Map showing Indian RCC boundaries and Indian MRCC boundaries are shown in figure 3-2

3.7.2.2.3 The Aeronautical and Maritime SAR services over the high seas in Indian SRR are provided by Indian Coast Guard.

3.7.2.3 In addition, various other departments of the Central and State Governments such as Railways, Post & Telegraph, All India Radio, Police and District Collectors/Magistrates, Municipal and Local bodies, Airline operators, Flying Clubs, Professional Pilots, Mercantile Marine, Port Trust and Armed Forces are available for search and rescue missions when required.

3.7.3 Satellite aided Search and Rescue

3.7.3.1 India is a participating member in the SARSAT-COSPAS programme which is a satellite-based search and rescue (SAR) distress alert detection and information distribution system. It operates on 406 MHz. Location accuracy is normally within 5 Km. The system will detect transmissions on this frequency throughout the Indian Search and Rescue Region (SRR) and also SRR of Bangladesh, Myanmar, Bhutan, Indonesia, Kenya, Malaysia, Maldives, Mauritius, Nepal, Seychelles, Singapore, Somalia, Sri Lanka, Thailand and Tanzania.

3.7.3.2 Under this programme Local User Terminals (LUT) have been established at Bengaluru and Lucknow. Indian Mission Control Centre (INMCC) at Bengaluru is responsible for coordinating with Rescue Coordination Centres and other International Mission Control Centres.

3.7.3.3 INMCC at Bengaluru is connected with RCCs at Chennai, Delhi, Kolkata and Mumbai through Aeronautical Fixed Service (AFS) network and any distress alert received for the areas covered is automatically transmitted to the concerned RCC.

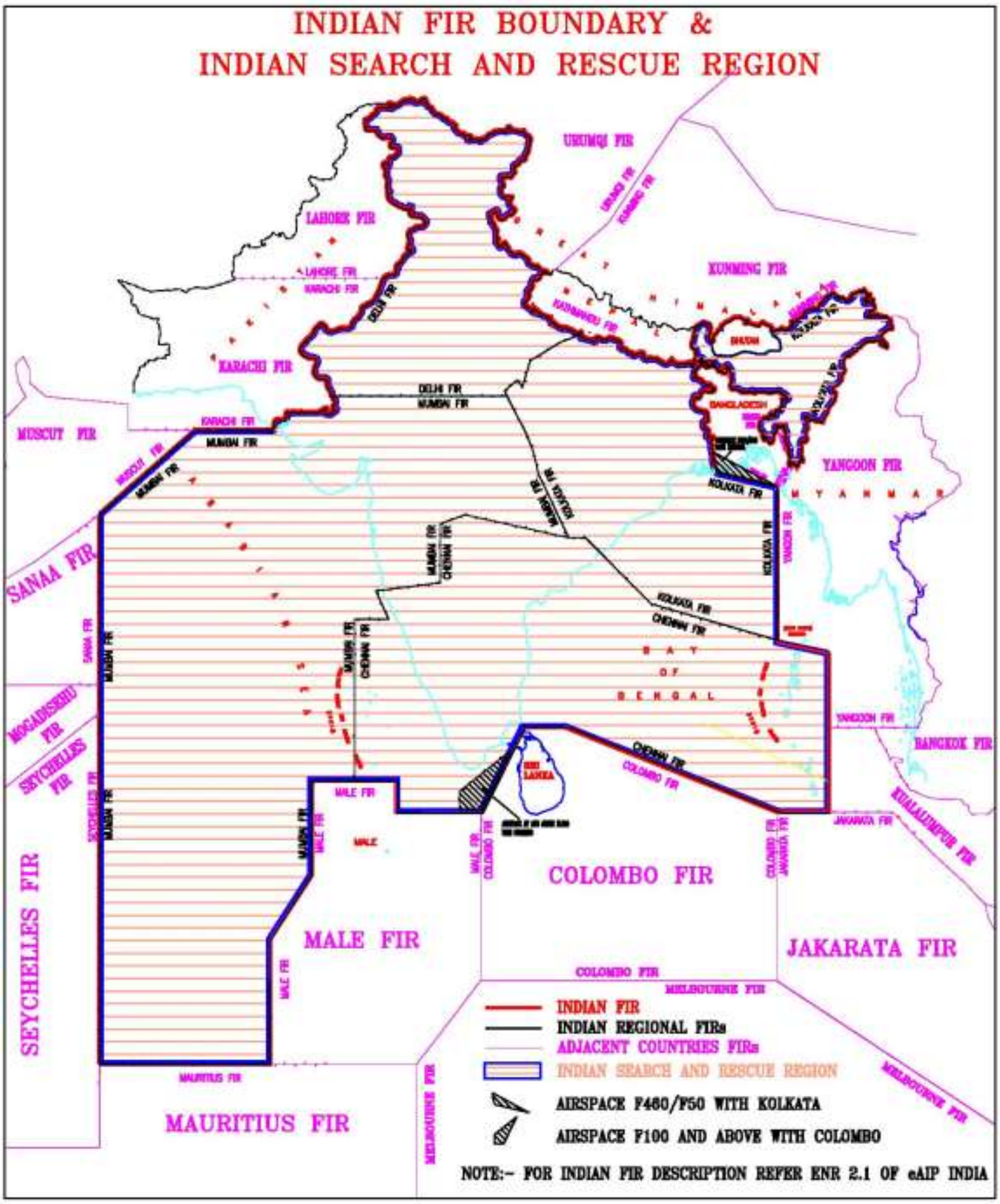


Figure 3-1: Indian FIR Boundaries and Search and Rescue Regions (SRRs)

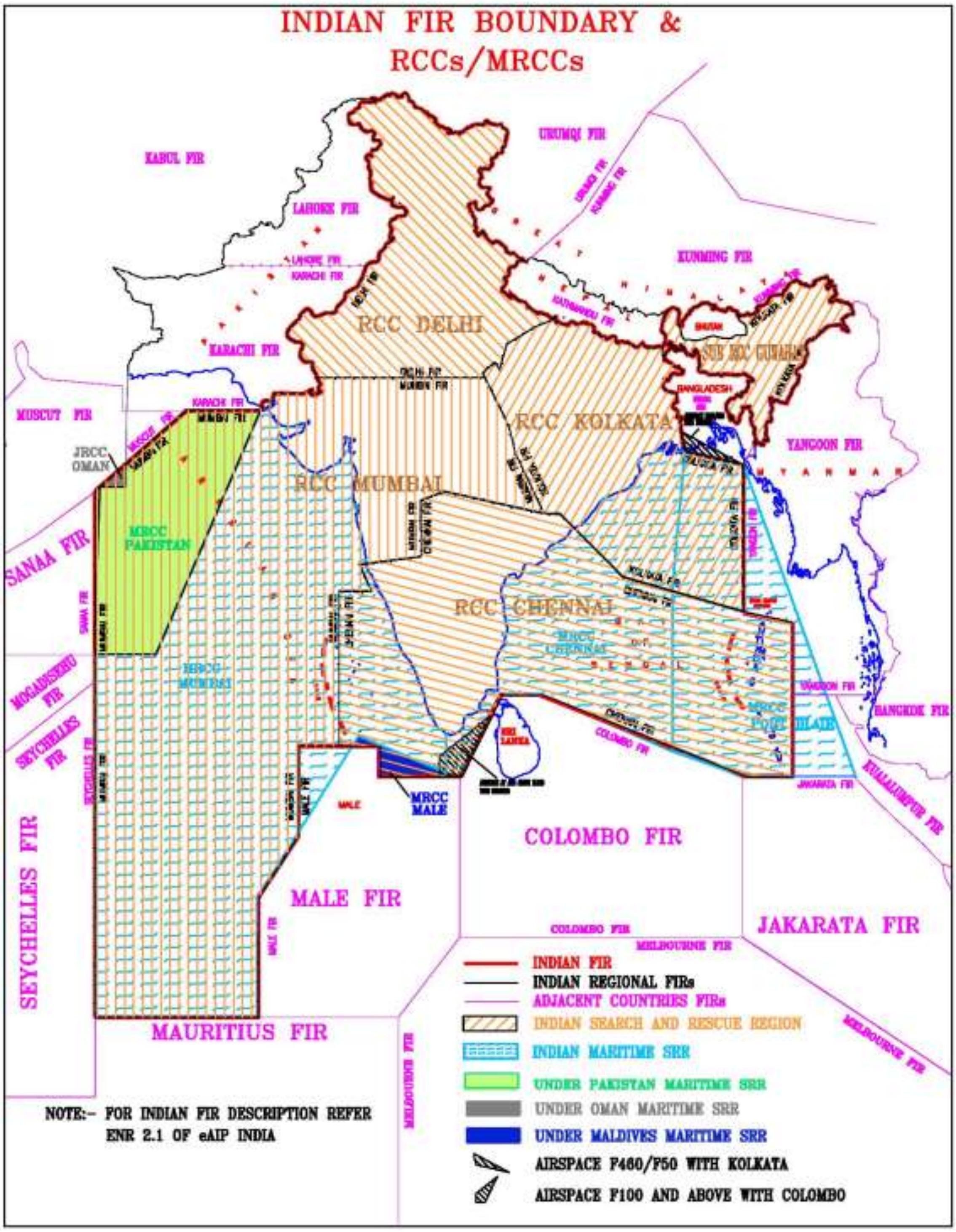


Figure 3-2: Indian FIR boundaries and RCCs and MRCCs

3.7.4 SAR Agreements

3.7.4.1 The Government of India has SAR Arrangement with The Royal Government of Bhutan for the Co-Operation on Search and Rescue Services.

3.7.4.2 India can seek SAR assistance from adjoining RCCs of other nations in accordance with the bi-lateral agreement.

3.7.4.3 For the purpose of SAR, the authorities of other State who wish their SAR units to enter the territory of India shall transmit a request, giving full details of the projected missions and the need for it to The Director General of Civil Aviation.

Note: The postal and telegraphic address of Director General of Civil Aviation is given in GEN 1.1 of e-AIP India.

3.7.5 Conditions of Availability:

3.7.5.1 The SAR services are provided on H24 basis irrespective of State of registry of aircraft or nationality of occupants. SAR operations are coordinated by Airports Authority of India with Ministry of Defence and other resource agencies through trained SAR personnel.

3.7.6 Procedures and signals used:

3.7.6.1 **Procedures and signals used by aircraft:**

3.7.6.1.1 Procedures for pilot-in-command observing an accident intercepting a distress message are outlined in ICAO Annex 12, Chapter 5.

3.7.6.1.2 Ditching report requested by aircraft about to ditch, are given in accordance with the provision in ICAO DOC 7605 MET/526 (the procedures for Air Navigation Services and Meteorology).

3.7.6.2 Communications:

3.7.6.2.1 Transmission and reception of distress messages within Indian search and rescue region are handled in accordance with ICAO Annex 10, Volume II, Chapter 5.

3.7.6.2.2 For communications during SAR operations, the codes and abbreviations published in ICAO Code and Abbreviations (Doc 8400) are used.

3.7.6.2.3 Information concerning position, call sign, frequencies and hours of operation of Indian aeronautical station is published in sections ENR 4.1 and AD 2 of respective aerodrome in eAIP India.

3.7.6.2.4 The frequency 121.5 MHz is guarded continuously during their hours of operation at all Area Control Centre (ACC) and Flight Information Centre (FIC). Other aeronautical stations, on request, will guard this frequency. All Coastal Stations guard the international distress frequencies.

3.7.6.2.5 Rescue aircraft belonging to permanent SAR units use the call-sign ZIGZAG. If more than one aircraft are engaged in SAR duties, a serial number is added to the basic callsign ZIGZAG.

3.7.6.3 SAR Signals:

3.7.6.3.1 The SAR signals to be used are those prescribed in Annex 12, Chapter 5.

3.7.7 Forced Landing:

3.7.7.1 In India, the Flight Information Centres act as Rescue Coordination Centres, in addition to their other functions. When an aircraft is reported or when it is known to have forced landed the RCC will immediately take action to notify all those who could usefully assist in the SAR operations and will coordinate their actions.

3.7.7.2 To enable the RCC to act promptly, it would require information as soon as an aircraft is in distress. While there may not be any difficulty in obtaining such information through the Air Traffic Services in respect of aircraft fitted with suitable two-way communication facilities certain difficulties may arise in respect of aircraft not fitted with such facilities. The RCC will then have to depend entirely on the information which it may receive of the forced landing either from the pilot or from other sources such as Army units, Police outpost, Railways or District authorities.

3.8 CONTINUED COMPETENCY OF ATCOs AND STATION LEVEL REFRESHER TRAINING FOR AIR TRAFFIC CONTROLLERS

3.8.1 Competency of Air traffic controllers in an Air Traffic Services Unit shall be maintained or enhanced through continued training consisting of following :

a) refresher training,

b) skill improvement training,

c) emergency handling training,

d) training on degraded mode of operations and

e) linguistic training, where appropriate.

3.8.2 The "Continued Competency Training" shall ensure the continued level of competency of the controllers and therefore shall be designed to review, reinforce or upgrade existing knowledge and skills, including team skills.

3.8.3 The procedures to ensure continued competency of Air Traffic Controllers on new equipment, procedures and updated communication systems shall be applicable when one or more of the following circumstances prevail;

a) Changes in existing facilities and equipment including degraded/failed mode of operations at the operating positions.

b) New equipment that may necessitate complete renewal of operations and new ATS units or centres.

c) Re-organization of the airspace that may involve changes in procedures, number of operating positions and assigned air-ground communication frequencies.

d) Introduction of new procedures or revision of existing procedures.

3.8.4 In developing these procedures, the ATS In-charges shall take into consideration the following provisions:

3.8.4.1 The duration of the “Continued Competency Training” shall be decided in accordance with the functional needs of the air traffic controllers in that particular ATC unit; in the light of changes or planned changes in procedures or equipment, or overall safety management requirements. The duration of the programme shall be so adjusted so as to provide for the necessary Knowledge, Skill and ability to demonstrate competence in the job performance in that ATC unit.

3.8.4.2 In order to be more effective, the “Continued Competency Training” should be a combination of theoretical concepts; where feasible, the practical experiences and the knowledge-based training including case studies. Controller competency in handling of aircraft emergencies and operations under conditions with failed or degraded facilities and systems shall be maintained by adequate refresher training.

3.8.4.3 All the controllers shall be subjected to training on Unusual Situations / Aircraft Emergencies and degraded mode of the operations at least once in a year.

3.8.4.4 Controllers, where the ATC unit/control sector is staffed by teams, shall be provided with relevant and adequate training on human factors / team resource management in order to ensure efficient teamwork.

3.8.4.5 The implementation of new or amended procedures, and new or updated communications, surveillance and other safety significant systems and equipment shall be preceded by appropriate training and instruction.

3.8.5 It is envisaged that the required skills shall be assessed through appropriate Competency Checks.

3.8.6 Records of all the “Continued Competency Training” given to an ATCO shall be maintained and suitable entries to this effect shall be maintained in the individual controller’s training file.

3.8.7 In order to maintain required skill levels and competency for effectively carrying out duties and responsibilities, it is necessary to provide Refresher Training at regular intervals to Air Traffic Controllers. The refresher training courses will help them to overcome any wrong perceptions and practices that might have crept-in, and to update their knowledge. For this purpose, such courses shall be conducted at all International and ACC Stations at least once every year.

3.8.8 The courses shall be conducted every year as per coordinated programme drawn and circulated to all concerned under intimation to ED (ATM)/GM (SQMS) at least fifteen days in advance so that officers from CHQ/RHQ may participate. The duration of the programme shall be so adjusted so as to provide for participation by maximum number of ATCOs which may include ATCOs from nearby field stations as far as operationally possible.

3.8.9 At Delhi, Mumbai, Kolkata and Chennai, the courses shall be conducted by Jt.GM/DGM – (Training) and other DGMs, OJT Instructors nominated by GM (ATM). At ACC stations, the courses shall be conducted by ATS-in charge/ Jt.GM/DGM (Trg) and OJT Instructors in consultation with GM (ATM)/GM (ATM) Region.

3.8.10 The course contents should cover topics specific to station level requirements for day-do-day provision of Air Traffic Services in a safe and efficient manner and may include; but not limited to, the following :-

i. Application of separation standards in scenarios emerging at the station.

ii. Coordination procedures and importance of correct phraseologies during exchange of movement and control data.

iii. Conflict detection and conflict resolution in relation to ATS Routes passing through respective CTA / TMA / FIR / CTR / ATZ as applicable.

iv. Awareness of human factors through discussion on case studies on aircraft incidents/accidents.

v. Contingency plan to deal with bomb threats, hijacking, aircraft emergencies, non-scheduled international flights forced to land, search and rescue etc.

vi. IAL procedures.

vii. ADIZs and procedures for Air Defence Clearances (ADCs)

viii. Degraded mode of operation of Communication, Navigation and Surveillance systems including automation system

ix. Airborne Collision Avoidance system (ACAS)

x. Prevention of Runway incursion

xi. Any other topics recommended by SQMS Section of ATM Directorate at CHQ.

3.8.11 The refresher training course should also include and provide for emerging scenario in CNS/ATM.

3.8.12 At the end of the refresher training course the participants should be divided in suitable groups for holding group discussions. This is to encourage ATC officers to bring out their difficulties in relation to the application of procedures and system deficiencies. The group should be encouraged to discuss the problems and suggest necessary corrective measures/solutions.

3.8.13 The problems / suggestions/ feedback be brought to the notice of CHQ.

3.9 Maintenance of ATS Unit Log Books

3.9.1 The log books maintained by the Air Traffic Services Units form an essential part of evidence required for an investigation. It is, therefore, imperative that such log books are maintained in a proper manner. The log books must be properly bound and pages serially numbered. In the log book no pencil entries should be made and no overwriting resorted to. Should any alteration to the entry already made, becomes necessary, the previous entry should be scored out by drawing a fine line over it and new entry made and duly signed. No entry should be erased once it is made.

3.9.2 Following certificate may be written by the officer opening the log book on first page:

"***Certified that this log book contains (number) pages numbered serially"***

3.9.3 All time periods during watch hours, must be covered by at least one qualified ATC Officer having taken over watch in the log book. No person should take over two active units at the same time unless units are treated as combined and considered as one.

3.10 RETENTION OF OPERATIONAL DOCUMENTS - PERIOD THEREOF - METHOD FOR DESTRUCTION

3.10.1 ATS records, operational documents, surveillance data of Primary and Secondary Radar and ADS/CPDLC data shall be preserved for the period mentioned against each item as indicated below:

a) LOG Books:

A	Air Traffic Control Officers' Log Book	1 Year
B	Aircraft movement logbook maintained in Tower [CA/AAI-17]	1 Year

b) Other Records:

A	Flight Progress Strips	3 months
B	Flight Plan/RPL	3 months
C	ATC Messages issued and received	3 months

D	CA12/AAI12	1 year or till inspection by Audit whichever is later
E	Met report, Met forecast, Met messages	3 months

c) Records relating to Statistics:

A	Non-scheduled Proforma filed by Pilots	6 months
B	Passengers Manifests	6 months

d) Returns:

A	Air Traffic Returns	3 years
B	Free Facilities Returns	3 years
C	Non-scheduled flights by foreign aircraft	3 years

e) Communication and Surveillance Data

A	Surveillance data and ADS/CPDLC data [recorded]	1 month
B	VHF, HF Radio, DSC, Telephone, Intercom-Voice Communication Data and CLD data	1 month

3.10.2 The data pertaining to accident or incident shall be preserved till such time the competent authority issue clearance in writing that the relevant data is no more required for investigation or for any other purposes.

3.10.3 The records mentioned at Para 3.10.1 a), b), c) and d) above, unless specifically required for investigation purposes, should be destroyed on the expiry of stipulated retention period by burning and a certificate in this regard should be recorded clearly listing the records so destroyed and the period to which they pertained to.

3.10.4 The data mentioned at para 3.9.1 e), above should be deleted/erased and the medium used for such recordings can be reused or destroyed as appropriate, on the expiry of stipulated retention period and a certificate in this regard should be recorded clearly listing the data deleted/destroyed and the period to which they pertained to.

3.11 ENTRY INTO AIR TRAFFIC CONTROL UNITS

3.11.1 The nature and type of work being carried out in the Air Traffic Control Units requires that there should be no unnecessary disturbance/distraction. This calls for restrictions to be imposed in the entry of persons to these units. No person other than those who have actual business with ATC units should be allowed admission to the units. Notice board to this effect should be exhibited at the prominent place leading entry to the ATC Unit.

3.12 PROCEDURES TO BE FOLLOWED IN ATC OPERATIONAL AREAS WITH RESPECT TO MOBILE PHONES:

3.12.1 Use of personal mobiles phones in ATC operational areas is not permitted. The Air Traffic Controllers shall keep their personal mobile phones on "switched off" mode when entering ATC operational areas.

3.12.2 Use of official mobile phones for coordination:

3.12.2.1 Use of official mobile phones if any, for coordination with other ATC Centres may be permitted when there is severe degradation of communication system causing coordination difficulties.

3.12.2.2 Such official mobile phones shall be available with WSO and handed over to Unit Supervisor, if all other means of communication for coordination have failed.

3.12.2.3 It may be noted that coordination done on mobile phone is not recorded and therefore, it has inherent disadvantage for purpose of quality control and investigation of an incident.

3.12.2.4 An entry in the unit Log book and WSO logbook shall also be made, clearly indicating the nature of difficulty necessitating the use of official mobile phone for coordination purposes.

3.12.2.5 When SSO office is located inside ATC operational area, use of official mobile by SSO should be done only when there is severe degradation of communication system causing coordination difficulties with remotely located CNS facilities.

3.12.3 Entry points to all ATC units shall have a notice displaying "**SWITCH OFF MOBILE BEFORE ENTRY"**. This shall apply to all visitors including CNS/Engg Maintenance personnel.

3.13 ATC WATCH TAKING OVER PROCEDURES

3.13.1 During the shift change, or whenever an Air Traffic Controller is relieved irrespective of the duration of relief, a mandatory 15 minutes overlap period shall be provided in which the relieved ATCO shall brief the relieving ATCO of complete traffic situation. The relieving officer shall plug-in the Head-set and monitor the progress of the traffic. The relieved officer will brief the relieving officer on all active and pending list of traffic. The relieving ATCO shall make a log entry of having received briefing and understood the traffic situation before assuming charge of Air Traffic Control duties in an ATC Unit.

3.13.2 The relieving officer shall first 'take over watch' in the logbook and sign to that effect followed by the 'handing over watch' by the relieved officer.

3.13.3 All ATC Officers before taking over watch must familiarize themselves with-

i. The current weather report and forecast
ii. Status serviceability of all VHF Channels
iii. Status of serviceability of direct telephones
iv. Status of Special user Airspaces (SUAs)
v. Current NOTAMs and bulletins
vi. Status of serviceability of inter unit and inter-centre facilities
vii. Status of serviceability of Radio Navigational aids / landing aids visuals aids etc.
viii. Status of serviceability of crash and fire alarm siren and bell (wherever applicable)
ix. Details of aircraft parked in the parking area (wherever applicable)

3.13.4 Any un-serviceability of the above facilities shall be recorded in the logbook.

3.13.5 ATS In-charge of ATC Centre/ Airport shall ensure strict compliance with these instructions.

3.14 DUTIES & RESPONSIBILITIES OF ATC WATCH SUPERVISORY OFFICERS (WSO)

3.14.1 Duties and Responsibilities of WSO

3.14.1.1 Watch supervision requires maintaining a constant watch over the traffic activity and operational conditions in order to provide timely assistance to controllers and to ensure that available resources are deployed for optimal efficiency. Watch supervision may be performed by a Jt. General Manager, Dy. General Manager, Asstt. General Manager or Senior Manager level officer depending upon the ATC centre. The objectives and tasks of Watch Supervision shall be more specifically mentioned in the MATS-Part 2 with focus on operational requirements of the station.

3.14.1.2 The duties and responsibilities shall specify, as a minimum, the required tasks for maintaining a safe and efficient operation.

3.14.1.3 WSO shall be overall in-charge of all ATS units during his period of duty and provide a management function to an ATC watch and shall be responsible for the tactical management of an ATC watch. This will, however, not relieve the ATCOs of their responsibilities.

3.14.1.4 In order to ensure efficient discharge of his duties and responsibilities, it is desirable that WSO possesses/acquires all the ATC ratings at the place of duty and maintains his proficiency in ATC.

3.14.1.5 Before taking over watch, WSO shall apprise himself of the present/ forecasted weather conditions in the FIR/ TMA/ airspace and at other adjoining aerodromes to which flights may divert. He shall also acquaint himself with all current NOTAMs and obtain proper briefing from the officer being relieved.

3.14.1.6 WSO shall devote sufficient time in each unit with a view to ensure that the ATS personnel perform their duties efficiently and in accordance with current SOPs and instructions. Shortcomings in the performance of work by ATCOs and other supporting staff should be taken note of and personnel concerned advised to improve the performance.

3.14.1.7 WSO shall ensure that all ATS units are adequately manned and if necessary redeploy ATS personnel to maintain optimum efficiency. At ACCs where the airspace is sectorised, WSO shall ensure that the consolidation/de-consolidation of the sectors is carried out without compromising safety and efficiency.

3.14.1.8 WSO shall ensure that the requirement for relief and training opportunities are adequately met.

3.13.1.9 WSO shall ensure safe and efficient flow of air traffic in accordance with Low Visibility Procedures during bad weather, fog and associated airspace/ airport closure.

3.14.1.10 WSO shall ensure effective supervision for smooth conduct of VVIP movements in accordance with station specific SOPs.

3.14.1.11 WSO shall ensure reporting of accidents, incidents, safety occurrences and any other reportable events as per procedures in vogue.

3.14.1.12 WSO shall ensure that performance and proficiency assessment of the controllers are carried out in his/her shift.

3.14.1.13 WSO shall monitor the serviceability of Navigational aids, Automation System and air/ground communication systems based on the reports received from ATCOs. In the event of malfunctioning of equipment or facilities, WSO shall take appropriate action at his/her level for the restoration of such facilities. For this purpose, he will coordinate with officials of CNS, Met and Airport Operators etc.

3.14.1.14 WSO shall carry out periodical checks to ensure that all relevant documents as specified in Table 3-1 are available for ready reference to ATS personnel on duty.

3.14.1.15 WSO shall also perform all other duties as specified in MATS-Part 2 of the concerned Airport/ATC Centre.

3.14.1.16 WSO shall also perform any other duties to meet the situational objectives in the shift.

3.15 DOCUMENTS TO BE KEPT IN ATS UNITS

3.15.1 It is necessary that the Air Traffic Service Units have a set of updated documents in paper or electronic format, relating to Air Traffic Control and other operational matters for ready reference as per Table 3-1.

3.15.2 ATS-in-Charge should ensure that these documents are kept in a prominent place in the ATS unit for study and reference purpose. The amendments as and when issued, should be incorporated without delay.

3.15.3 ICAO Annexes and Documents related to ATM are available on "infosaarthee website" (http://infosaarthee.aai.aero/Pages/InfoSaarthee.aspx). The documents can be accessed through the steps Home > Board Members > Air navigation services > Air Traffic Management > Aeronautical Services.

S. No.	Document to be kept in ATC unit
1.	AIP India & AIP Supplements
2.	Manual of air Traffic Services Part 1 & 2
3.	DOC 4444
4.	Annex-11
5.	Annex-2
6.	Annex- 14
7.	Coordination procedures/LOAs
8.	Set of relevant AICs
9.	Set of NOTAMs
10.	Relevant DGCA Circulars/Civil Aviation Requirement (CAR)
11.	ATMCs
12.	Station Standing Instructions/ Circulars
13.	Aerodrome Manual along with all the relevant SOPs
14.	Station Level SOP for handling of VVIP Flights
15.	Search & Rescue Manual
16.	AIS Manual
17.	Document Management Manual
18.	All Airport Emergency/ Contingency Plans
19.	Station Safety Management Manual
20.	Updated status on Aviation Safety Audit Report & DGCA inspection Report
21.	Any other relevant Document

Table- 3-1: Document to be kept in ATC unit

3.16 PROCEDURE FOR OPENING, CLOSING AND EXTENSION OF ATC WATCH

3.16.1 ATC Watch Hour

3.16.1.1 ATC Watch hours is the duration during which air traffic services are provided at an aerodrome and notified.

3.16.2 Fixation & Notification of ATC Watch hour

3.16.2.1 ATC watch hours are decided taking into consideration scheduled flight movements and operational requirements.

3.16.2.2 The ATC watch shall be opened at least thirty minutes prior to the first scheduled movement from the concerned airport or on operational requirement as decided by GM (ATM) Region.

3.16.2.3 ATC watch shall be closed 15 minutes after the last scheduled arrival or 30 minutes after the last scheduled departure or as decided by GM (ATM) region.

3.16.2.4 ATC watch hours of airports are notified through NOTAM with the approval of GM (ATM) Region.

3.16.3 Opening & Closing of ATC watch

3.16.3.1 Opening and closing of ATC watch hours shall be in accordance with the promulgated NOTAM for the station concerned.

3.16.4 Actions to be completed prior to opening of ATC watch

3.16.4.1 The Tower Controller shall take his position in such a manner that the following actions are completed at least 30 minutes prior to the opening of ATC watch:

a) Inspection of operational area;

b) Familiarization with:

i) Current weather report and forecast (wherever applicable);

ii) Status of serviceability of VHF Channels, intercom, radio navigational/ landing aids, visual aids etc.;

iii) Status of serviceability of direct telephones and hotline with fire station and adjacent ATS units;

iv) Status of restricted/danger areas;

v) Current NOTAMs and bulletin;

vi) Status of work in the operational area during/ beyond ATC watch hours;

vii) Status of serviceability of Crash and Fire alarm siren and bell;

viii) Category of Fire and Rescue Safety Services;

ix) Status of Aerodrome beacon;

x) Details of aircraft parked;

xi) VVIP movement if any;

xii) Operationally significant information recorded in the log book;

xiii) Any other pertinent information.

3.16.5 Extension of ATC watch beyond notified watch hours

3.16.5.1 Watch hours may be extended beyond notified watch hours:

a) To meet exigencies and natural calamities like floods etc. for the purpose of rescue/flood dropping missions.

b) To cater for delays to scheduled and duly authorized non-scheduled services, VVIP flights,

c) To cater to flights under-taken by Chief Minister/Governor of the state and military flights on emergency mission.

d) To cover the flight of an aircraft in emergency.

e) When directed by the concerned GM (ATM) Region/APD/WSO of the ACC/flight information centre of the Region.

3.16.5.2 In all the cases of extension of ATC watch proper coordination with the concerned Flight Information Centre/Area Control Centre shall be affected by Duty officer, control tower.

3.16.6 Station level Circular on ATC Watch hours

3.16.6.1 Every station shall prepare a SOP for strict compliance of all controllers where watch hours of Tower/Approach is not round the clock.

3.17 PREVENTION OF SAFETY OCCURRENCES DURING ON-THE-JOB TRAINING (OJT)

3.17.1 On-the-Job Training (OJT) is provided by the OJT-Instructor (OJTI) or an ATCO authorised by the ATS incharge, generally referred as Instructor; to train air traffic controllers in a live traffic environment for providing the necessary skills and knowledge to the trainee ATCO up to an appropriate level of competence. Since a trainee controller is in a learning stage and therefore, he is prone to commit errors/ mistakes inadvertently. Errors which are not checked or corrected on time may get manifested into a safety occurrence. Therefore, the Instructor, shall take over the control in a potentially unsafe situation and timely intervene to ensure adequate safety margin.

3.17.2 Sometimes, the Instructor allows a situation to develop for the purpose of training to develop the trainee's response for a corrective action. However, the interest of safety must prevail over the trainee's ability to learn from errors. Instructors, therefore, must be aware of the level of competence of the trainee they are supervising. A situation should not be allowed to develop to a level where intervention even by the Instructor would not be enough for ensuring safety.

3.17.3 The error committed by the trainee controller may subsequently be recreated in simulation or in a briefing session to explain why the intervention of Instructor was required.

3.17.4 To avoid any safety situation arising out of an error in judgement or in application of a procedure by a trainee, it is required that the Instructor shall have direct supervision on trainee controller while imparting training.

3.17.5 To minimize the ATC incidents during and immediately after taking over watch for the purpose of imparting on-the job-training, the following procedure shall be followed:

3.17.5.1 The ATC channel shall be taken over first by the Instructor and where possible in VCCS, plug in the headset at the position having override facility.

3.17.5.2 The Instructor shall assess the traffic situation and shall have complete control over the traffic situation before allowing the trainee to start the OJT. It is imperative that due consideration shall be given to the level of competency of the trainee vis-a-vis complexity and density of traffic before allowing the trainee to handle R/T.

3.17.5.3 The trainee ATCO shall take briefing regarding the traffic scenario from the Instructor on channel and then begin OJT with the permission of the concerned Instructor.

3.17.5.4 During the training, Instructor who has taken over watch for imparting training, shall be responsible for provisions of Air Traffic Services to all aircraft under his jurisdiction.

3.17.5.5 The Instructor shall give complete briefing of the traffic situation to the relieving officer before handing over watch on completion of OJT.

3.17.5.6 The WSOs/Supervisors shall ensure that the provisions laid down here are strictly followed by all the ATCOs under their supervision.

3.17.5.7 Any unsupervised on-the-job training and also any safety occurrence during on-the- job training shall be investigated by the ATS in-charge concerned and suitable remedial actions shall be taken to prevent any such unsupervised on-the-job training and safety occurrence in future.

3.17.5.8 Due to their age, experience and knowledge, the Instructors unwittingly become role models for trainee controllers who closely observe their professional behaviour, work ethics and adherence to procedures. Trainee controllers get strongly influenced by the behaviour of their Instructor. Any unprofessional behaviour such as lack of supervision, risk taking attitude, poor time keeping, engaging in activities causing distractions at working positionetc. by the Instructor; leaves adverse impression on the trainee controller which influences their personality and behaviour too. Therefore, all the Controllers imparting training are advised to take utmost care in their behaviour and conduct in the workplace and exhibit utmost professionalism when on duty at ATC Centres/Units.

3.18 UNDUE INTERFERENCE/COUNSELLING TO CONTROLLERS ON INTERCOM

3.18.1 General

3.18.1.1 There is a tendency among senior controllers to give unsolicited advice to other controllers on Intercom. This is more prevalent from Approach Surveillance controller to Aerodrome controller. These advices often take the form of command or instructions to handle a situation in a certain manner without being fully aware of the circumstances in which the other controller is working, hence, advice is given solely on assumptions. This leads to unsafe situation where the controller acts in haste on the advice of the senior controller without comprehending the situation correctly. This is more common when the advice giver is the OJTI and the receiver is a former trainee, in such situations the OJTI takes the role of 'more knowledgeable person' in the relationship dynamic, and giving advice puts him/her in a dominating position. This exerts an unnecessary stress on the controller receiving the advice and the controller acts solely on the advice of the senior controller and not on his/her own judgement.

3.18.1.2 When this unwarranted advice is prolonged the controller receiving the advice is neither able to concentrate on traffic situation in hand nor is able to respond to pilot's transmissions. Such unsolicited advice not only causes irritability and chaos but also leads to not so pleasant interpersonal relations between the two controllers which is detrimental to an efficient teamwork.

3.18.1.3 The controller who is being advised is better aware of the situation under his/her jurisdiction and can best handle it. The surveillance controllers may not be aware of the positions of ground traffic and the complications in tower. The spacing between arrivals may seem justified to the surveillance controller, but the position, taxing speed of the departure and other factors is only known to the tower controller.

3.18.2 Following procedures shall be followed to avoid undue interference/counselling to controllers on intercom.

3.18.2.1 A controller is responsible for the air traffic in his area of jurisdiction, therefore, he is accountable for the actions and decisions taken for the provision of safe and efficient air traffic services in respective area of responsibility.

3.18.2.2 A controller, who unnecessarily interferes in the working of the other controller, disturbs the thought process and affects the decision making ability of that controller. This leads to confusion, indecisiveness and inefficiency. Therefore, unless a situation warrants so, no controller shall interfere in the traffic planning of the other controller.

3.18.2.3 If in the opinion of any controller a traffic situation warrants effective inter-unit coordination and planning for the purpose of safe and efficient handling of air traffic; then the same may be brought to the notice of the concerned unit supervisor or the watch supervisory officer (WSO).

3.18.2.4 An Approach Surveillance controller with his experience and better surveillance tools and skills can provide valuable input to newly rated Aerodrome controllers. But, in no case such input or advice be given in a manner which may appear as binding on the Aerodrome controller. The final decision shall lie with the Aerodrome controller as he is in better position to judge the traffic situation under his/her jurisdiction.

3.18.2.5 If a safety critical situation warrants an immediate intervention from an Approach Surveillance controller, then the advice/instructions to the Aerodrome controller shall be precise, brief and in a calm voice so as not to create stress and panic.

3.18.2.6 A senior Approach Surveillance controller shall not behave in a manner on intercom which may intimidate the Aerodrome controller and force him to commit a mistake which could otherwise have been avoided.

3.18.2.7 If in the opinion of the Approach Surveillance controller, an Aerodrome controller needs to be counselled, then, the counselling shall be done in person and preferably in confidence, after the Aerodrome controller has been relieved from the controlling position.

3.19 REPORTING AND INVESTIGATION OF AIR TRAFFIC INCIDENTS

3.19.1 Reporting of air traffic incidents.

3.19.1.1 An air traffic incident reported through ATS air-ground communication channel or known to have occurred shall be recorded with any associated information in the log book of the ATC unit in which it had taken place by the concerned ATCO and immediately brought to the notice of Watch Supervisor/ATS In charge, as applicable.

3.19.1.2 ATS in-charge/Watch Supervisory Officer (WSO) shall provide relief to the controller who was involved in ATS incident from the ATS channel as promptly as operational and staffing conditions permit. This action allows controllers the opportunity to prepare statements while the circumstances are still fresh in their minds.

3.19.1.3 It shall be the responsibility of ATS In-charge/WSO to report air traffic incidents to Director/Regional Controller of Air Safety, Civil Aviation Department, Government of India by the fastest means of communication like telephone, FAX, AFTN message etc.

3.19.1.4 Information regarding an air traffic incident shall also be reported immediately to Member (ANS), ED (ATM) / GM (SQMS) telephonically following its occurrence.

3.19.1.5 Air traffic incident report Form as shown in Annexure 1 shall be used by ATS units while initially recording and reporting an air traffic incident. The format may also be used for the text of a message to be transmitted over the AFTN network. As such, copies of the form should be made available in all ATS units. Air traffic incident report form may be faxed and e-mailed to ED (ATM), ED (Aviation Safety) and GM (SQMS) at the earliest.

3.19.1.6 The incidents listed below are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.

a) Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.

b) Controlled flight into terrain only marginally avoided.

c) Aborted take-offs on a closed or engaged runway, on a taxiway (Excluding authorized operations by helicopters) or unassigned runway.

d) Take-offs from a closed or engaged runway, on a taxiway (Excluding authorized operations by helicopters) or unassigned runway.

e) Landings or attempted landing on a closed or engaged runway, on a taxiway or unassigned runway.

f) Gross failures to achieve predicted performance during take-off or initial climb.

g) Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.

h) Events requiring the emergency use of oxygen by flight crew.

i) Aircraft structural failures or engine disintegrations, including; uncontained turbine engine failures, not classified as an accident.

j) Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.

k) Flight crew incapacitation in flight.

l) Fuel quantity requiring the declaration of an emergency by the pilot.

m) Runway incursions classified with severity A. The Manual on the Prevention of Runway Incursions (DOC 9870) contains information on the severity classifications.

3.19.1.7 Air traffic incidents are identified and designated in reports as given in Table 3-2.

Type of air traffic incident	**Designation of incident**
Aircraft proximity	AIRPROX*
Serious difficulty caused by faulty procedures or lack of compliance with applicable procedures	Procedural
Serious difficulty caused by failure or ground facilities	Facility

Table 3-2: Air Traffic Incidents- Designation

3.18.1.8 AIRPROX is the abbreviation used in an air traffic incident report to designate aircraft proximity. Aircraft proximity is a situation in which, in the opinion of a pilot or air traffic service personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. An aircraft proximity is classified as follows:

i. *Risk of collision*: Serious risk of collision has existed.

ii. *Safety not assured*: The safety of the aircraft may have been compromised.

iii. *No risk of collision*: No risk of collision has existed.

iv. *Risk not determined*: Insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

3.19.1.10 Non-recording and non-reporting of an air traffic incident shall be considered, as an attempt to suppress information and the same shall be avoided under all circumstances.

3.19.2 Investigation of Incidents

3.19.2.1 Initial Action

3.19.2.1.1 Immediately following an air traffic incident all documents (viz. log book, flight progress strips, meteorological reports/ forecasts etc.) and recordings (viz. VHF/Radio transmissions, intercom, Radar recording, telephone communications etc.) relating to the incident shall be preserved for investigation purpose.

3.19.2.1.2 An air traffic control officer involved in an air traffic incident shall normally be withdrawn from the ATS unit in which the incident has taken place If the preliminary investigation on the basis of documental evidence suggest no prima facie case against the controller, he/she may be restored to the ATC unit from which he/she was withdrawn by ATS In-charge; in consultation with Director/ Regional controller of air safety, Civil Aviation Department, Government of India and intimated to ED (ATM)/GM (SQMS).

3.19.2.2 Preliminary Investigation

3.19.2.2.1 A preliminary report about the incident shall be prepared by ATS In-charge and forwarded to Director (Air Safety) DGCA HQ, ED (ATM) and ED (Aviation Safety) and Regional Offices of Air Safety Directorate, DGCA within three days of the occurrence of the incident. It shall contain prima facie facts and shall include the following:

a) details of aircraft involved (call sign, type, registration marking, operator and place of departure & destination);

b) names and operating positions of ATS personnel involved;

c) full details of the sequence of events in narrative form;

d) statements by personnel involved;

e) transcript of relevant voice recordings and telephone communication;

f) copies of flight progress strips and other flight data, including graphical presentation of radar data;

g) copies of meteorological reports and forecast relevant to the time of the incident.

3.19.2.2 Investigation of incident by Investigation board

3.19.2.2.1 DGCA will evaluate each ATS Incident report received to decide which occurrence require investigation by the DGCA or by the concerned Airprox Investigation Board (AIB) under the supervision of the DGCA.

3.19.2.2..2 Airprox Investigation Board (AIB) has been established by the DGCA at four regional offices at Delhi, Mumbai, Kolkata, Chennai, and one sub-regional office at Hyderabad. The jurisdiction of these regional/sub-regional offices for the purpose of reporting and investigation of safety occurrences is as appended in Table 3-3:

Region	Regional Office	Jurisdiction
Northern Region	DAS Delhi	Delhi, Haryana, Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Rajasthan, Chandigarh, Uttar Pradesh and Punjab.
Western Region	DAS Mumbai	Maharashtra, Goa, Daman & Diu, Gujarat, Madhya Pradesh and Chhattisgarh.
Eastern Region	DAS Kolkata	Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Sikkim, W. Bengal, Orissa, Bihar, Jharkhand, Assam, Tripura and Manipur.
Southern Region -I	DAS Chennai	Tamil Nadu, Kerala, Pondicherry, A&N Island, Lakshadweep
Southern Region -II	RCAS Hyderabad	Andhra Pradesh, Karnataka, Telangana.

Table 3-3: The jurisdiction of regional/sub-regional offices of DGCA for the purpose of reporting and investigation of safety occurrences

3.19.2.2.3 However, for the purpose of the reporting and investigation of an Airprox incident or any other safety occurrence in the airspace, the AIB having the jurisdiction at the Airport/ATC Centre providing the Air Traffic Services at the time of the incident will be responsible for the investigation of such Airprox Incident/safety occurrence.

3.19.2.2.4 The Airprox Investigating Board (AIB) has the composition as given in Table 3-4.

Sl.	Participants	Designation in the Board
1.	**Director General of Civil Aviation, DGCA :** Director Air Safety/Regional Controller of Air Safety or his representative.	Convener
2.	**ANS service provider:** ATM - Joint General Manager / Deputy General Manager (ATM-SQMS)	Member Secretary
3.	**ANS service provider:** AAI (CNS) Representative of CNS Directorate of AAI at Joint General Manager level for occurrences concerning Communication Incidents as and when required.	Member

Table 3-4: The composition of Airprox Investigating Board (AIB)

3.19.2.2.5 AIB may opt any other member if felt necessary. In case Air Force pilots or Air Force ATCO are involved in an incident matter be referred to DGCA. DGCA (HQ) will affect co-ordination for participation of IAF representative in the investigating team.

3.19.2.2.6 Investigating Board will review all evidence including transcript, DFDR Read out (whenever required), statements of all concerned etc.

3.19.2.2.7 Investigating Board if required may seek clarification from ATCO, CNS/Airport Personnel, pilots or any other concerned person.

3.19.2.2.8 After due deliberation by AIB, an Investigation Report will be made by Member Secretary in coordination with the Convener and other Members. The Investigation report should include a brief summary of the incident, sequence of events in narrative form, analysis with all relevant information, and conclude with a list of findings, conclusions, causes and safety recommendations for the purpose of accident/incident prevention. Investigation Report shall be made as per format given in Text Box "A".

3.19.2.2.9 Actual time required for investigation will depend on the complexity of each case. However, investigation should be completed at the earliest. The Investigation Report of an Air Traffic Incident should be completed within the period of 30 days from the date of the incident. In case of any likely delay, DGCA HQ should be kept informed about the reasons for such delay by the Member Secretary.

3.19.2.2.10 The Convener shall forward two copies of Investigation Report to Director Air Safety (DGCA HQ) and the Member Secretary shall forward a copy of the Investigation report to the ED (ATM), AAI CHQ. The report shall be accompanied with relevant evidences, dissent note, if any, and views of the convener if any.

3.19.2.2.11 Safety recommendations of the investigation reports shall be finalized jointly by DGCA HQ and AAI CHQ. ATM Directorate of AAI CHQ will communicate the finalized safety recommendation to concerned AAI Offices/ATS In-charges for corrective action if any.

3.19.2.3 **Action taken report on recommendations:**

3.19.2.3.1 Action taken report on recommendations, as conveyed to AAI Offices/ATS In-charges by AAI CHQ, shall be submitted within 15 days by them to Regional Air Safety Offices, Director Air Safety (DGCA HQ) and the ED (ATM), AAI CHQ.

3.19.2.4 **Submission of Statistical Reports:**

3.19.2.4.1 A monthly, quarterly and yearly report, (as per format given in Text Box "B", of the reportable occurrences occurred during the previous month/quarter/year including status of their investigation and status of action taken on recommendations shall be submitted by all ATS In- charges to concerned regional air safety offices, DAS DGCA, HQ and ED (ATM), AAI CHQ, in soft as well as hard copy.

3.19.2.4 Return of involved controller to operational duties:

3.19.2.4.1 The reasons for suspension of a controller's rating and the assignment of corrective/proficiency training are to assist and enhance the individual controller's performance to the best of his/her abilities and that minimum quality standard are met, It is not intended that this process be viewed as punishment towards any individual. This will also improve the overall performance and quality of the air traffic services.

3.19.2.4.2 After completion of the corrective/proficiency training the controllers rating shall be restored as per recommendation of final investigation report issued by ED (ATM) in consultation with DGCA.

3.19.2.5 Follow-up action

3.19.2.5.1 Follow up action on the final recommendation of the incident will immediately be initialed by the concerned ATS/CNS in-charge and action taken report will be sent to ED (ATM) within 15 days.

3.20 Violation Reports.

3.20.1 Violation reports filed for non-compliance of ATC instructions, and ATS route violations shall be investigated by the ATS In-charge if the report so filed indicates that safety of flights was endangered.

3.20.2 A detailed report of investigation shall be forwarded to ED (ATM) within 15 days of the date of occurrence together with relevant records including, inter-alia, certified copies of tape transcripts and an explanation of pilot, if available.

3.21 PROCEDURE TO BE FOLLOWED IN CASE OF AIRCRAFT ACCIDENTS & SERIOUS INCIDENTS

3.21.1 General

3.21.1.1 The Aircraft (Investigation of Accidents and Incidents) Rules, 2012 lay down the requirements of Notification, Reporting and Investigation of aircraft accidents and serious incidents in respect of civil registered aircraft.

3.21.1.2 An independent Aircraft Accident Investigation Bureau of India has been set up by Ministry of Civil Aviation, Government of India vide notification No. AV. 11012/01/2011 – DG dated 30th July 2012 to separate the functions of the regulator (DGCA) and the accident investigation. The functions of the Bureau have been stipulated in Rule 8 of the Aircraft (Investigation of Accidents and Incidents) Rules, 2012.

Format for the Investigation Report

Synopsis:

1. **Factual Information**

1.1 History of the Flight

1.2 Injuries to persons

1.3 Damage to aircraft

1.4 Other damage

1.5 Personnel information

1.6 Aircraft information

1.7 Meteorological information

1.8 Aids to Navigation

1.9 Communication

1.10 Aerodrome information

1.11 Flight recorders

1.12 Wreckage and impact information

1.13 Medical and pathological information

1.14 Fire

1.15 Survival aspects

1.16 Tests and Research

1.17 Additional information

1.18 New investigation techniques

Note: The information which are not applicable to the incident, may be mentioned as “Not applicable” in the report.

2. **ANALYSIS**

3. **CONCLUSIONS**

3.1 Findings:

3.2 Causes:

4. **SAFETY RECOMMENDATONS**

Text Box A: Format for the investigation report (see 3.19.2.2.8)

S.no.	Date	Airport/ Place of Occurrence	Operator	Aircraft				Phase of Flight	Brief description	Classification of Occurrence Operational/ Engineering/ RA/ Ground incident/ Wildlife strike/ Misc)	CICTT*	ATA Chapter!	Findings in Investigation Report	Probable Cause as per investigation report	Recommendations made in the investigation report	ATR on recommendations	Status of Investigation (Open/ Close)
				Type	Registration	Flight No	Sector										

* : CICTT (CAST ICAO Common Taxonomy Team): For reporting by Aircraft Operator

!: ATA Chapter: For reporting by Aircraft Operator

Text Box B: format for monthly, quarterly and yearly report (see 3.19.2.4.1)

3.21.2 Notification

3.21.2.1 The notice and information of accidents as stipulated above shall be sent as soon as possible by the quickest means available and in any case within 24 hours to:

a) The Aircraft Accident Investigation Bureau, Ministry of Civil aviation;

b) Director General of Civil Aviation (Attn: Director Air Safety, Hqrs.);

c) Regional Air Safety Office(s) where the location of the occurrence falls; and

d) District Magistrate and the Officer Incharge of the nearest police station.

e) Chairman, Airports Authority of India;

f) Member (ANS), Airports Authority of India;

g) ED (ATM), Airports Authority of India; and

h) Control room via E-mail/Fax for dissemination of information to all concerned in Ministry of Civil Aviation, DGCA and AAI.

3.21.2.2 For the purpose of information "as soon as possible by quickest means available" would mean that the information should be forwarded by SMS, Fax, telephone / mobile immediately without any loss of time.

3.21.2.3 The notification shall be in plain language and contain as much of the following information as is readily available, namely:-

i. For accident the identifying abbreviation ACCID AND for incident INCID;

ii. the type, nationality and registration marks of aircraft;

iii. the name of the owner, operator and hirer of the aircraft;

iv. the name of the person-in-command of the aircraft (if available);

v. the nature and purpose of the flight;

vi. the date and time of the accident;

vii. position of the aircraft with reference to some easily defined geographical point and latitude and longitude;

viii. the last point of departure and the next point of intended landing of the aircraft;

ix. the nature of the accident and the extent of known damage to the aircraft;

x. number of persons on board, killed and seriously injured (if available); and

xi. physical characteristics of the accident or incident area, as well as an indication of access difficulties or special requirements to reach the site.

3.21.3 Preservation of Records

3.21.3.1 Immediately following an aircraft accident all documents (viz. log book, flight progress strips, meteorological reports/forecasts etc.) and recordings (viz. VHF/Radio transmissions, intercom, Radar recording, telephone communications etc.) relating to the accident shall be preserved for investigation purpose.

3.21.3.2 All ATC/CNS documents relating to the aircraft accident shall be segregated sealed and shall be handed over to DGCA Officers who shall determine the adequacy of action as deemed appropriate and may seal any other documents etc. pertinent to the investigation of the accident as any of the material could be of use to the investigating authority.

3.21.3.3 Such records shall not be disclosed or made available to anybody for purposes other than accident investigation.

3.21.4 Procedure for handling aircraft accidents

3.21.4.1 The procedure for handling of aircraft accidents at and in the vicinity of aerodrome shall be followed as per Contingency/ Airport Emergency plan and SOP of each airport.

3.21.5 Withdrawal of ATCO Involved in Aircraft Accident

3.21.5.1 An ATCO involved in an aircraft accident requiring notification under Rule 68 and 69 of Indian Aircraft Rules, 1937 shall not be permitted to perform ATC duties in the unit in which he was handling the aircraft in question, pending specific authorization from Director General of Civil Aviation. If the basic circumstances surrounding an accident, prima-facie, indicate that the proficiency of the ATCO is not in doubt, clearance to resume duty in the unit concerned may be granted by the DGCA pending finalization of the investigation report. However, this action will be deemed to have been taken without prejudice to any action that may be recorded in the report of investigation.

3.22 SELECTION, DUTIES AND RESPONSIBILITIES OF JT. GM / DGM (SQMS)

3.22.1 Selection Criteria

3.22.1.1 The selection of Jt.GM/DGM (SQMS) shall not be on the basis of seniority alone but on the basis of suitability of the candidate for the posts on the basis of experience, professional competency & attitudinal attributes.

3.22.1.2 Knowledge, skills, and abilities (KSA) that shall be considered for selecting candidate for the post of Jt. GM/DGM (SQMS), include but not limited to:

i. Problem solving and analytical ability (Both ATC & system related);

ii. Planning and organizing (Shift, training, workshops or any other activities related with ATM);

iii. Decisiveness (as a senior, unit supervisor, WSO on ATM related issues);

iv. Judgement (as an ATCO, Supervisor, Team leader etc.);

v. Communication skill (as an ATCO, Supervisor, Team leader etc.);

vi. Their contribution as an individual or as a team to achieve the goal set by the management;

vii. Any special achievement during past 2-3 years.

3.22.2 Experience

3.22.2.1 The experience that shall be considered for selecting candidate for the post of Jt. GM/DGM (SQMS) shall include but not limited to:

a) All procedural and surveillance ratings of the airport concerned.

b) At least two years' experience as WSO at present Airport/ATC Centre or any other major airport or ATC Centre/ JGM (Trg)/Instructor at CATC Allahabad or any other Training centre/ OJTI/JGM or DGM level at CHQ;

c) Preparation of any ATM related documents viz., SOPs, Manuals etc.

d) Any initiative shown by the individual in the way of change / amendment of existing procedure to enhance capacity/efficiency;

e) Any initiative by the individual to enhance safety in the existing system by suggesting new measures.

f) Incident free record in preceding two years.

3.22.2.2 ED (ATM), depending upon candidate's past experience and performance may relax criterion enumerated in sub para 3.22.2.1 a) and b).

3.22.3 Selection Process

3.22.3.1 ATS Incharge will prepare a panel of all the eligible ATCOs and forward their name along with recommendation to ED (ATM) for selection process.

3.22.3.2 ED (ATM) will constitute a board to conduct a viva-voce and to make a final selection amongst the panel of eligible ATCOs as drawn above.

3.22.3.3 The board for conducting the viva-voce and assessment will comprise the following officers:

i. ED (ATM) or his nominee : CHAIRMAN

ii. GM (ATM-SQMS) or his nominee: Member

iii. GM(ATM) of Airport/GM (ATM)-Region or a member nominated by ED (ATM): Member

Note1: In case the nominee of ED (ATM) is GM/Jt. GM/DGM, the senior most officer shall act as the Chairman of the board.

3.22.4 Duties & Responsibilities of Jt. GM/DGM (SQMS)

3.22.4.1 The duties and responsibilities of Jt. GM/DGM (SQMS) shall be as follows:

i. Monitor performance of ATCOs by conducting performance/ proficiency checks and to maintain relevant records. If during such a check, it is found that the performance of an ATCO “Does not meet requirement” or “Meets the requirement but needs improvement in specified areas”, he should report the same to the GM (ATM)/ATS Incharge, who in turn may suspend the rating of the controller and recommend additional training and report such cases to ED (ATM).

ii. Assist General Manager (ATM)/ ATS Incharge in operational matters for smooth management of air traffic services at the airport.

iii. Perform duties and responsibilities of ATS Incharge when he is the senior most officer at the station of posting.

iv. Ensure timely promulgation of all relevant operational information to ATC in coordination with the General Manager (ATM)/ ATS Incharge.

v. Prepare and update various SOPs including MATS-Part 2 at the airport.

vi. Ensure completion of safety assessment before implementation of any new procedure.

vii. Carry out investigation of ATC incidents/accidents as per AAI CHQ and DGCA instructions/ guidelines. Initiate follow-up action on ATC incidents / accidents and sensitize the controllers wherever required.

viii. Assist GM (ATM) in management of duty rosters of ATCOs so that each shift forms a balanced team in order to promote safety in aircraft operations while at the same time providing adequate number of officers for on-the-job training in various ATS units.

ix. As a member of the rating board at the airport, shall ensure that rating of ATCOs are not delayed.

x. Carrying out random checks of ATC tape transcript to assess performance of ATCOs posted at the airport and take follow up action in consultation wherever required on monthly basis and send it to CHQ every month.

xi. Any other function assigned by GM (ATM) of the airport or ATS

Incharge/GM (ATM-Region) for field station not headed by GM (ATM) & GM (ATM-SQMS).

3.22.5 Validity

3.22.5.1 The selection of Jt.GM / DGM (SQMS) will be valid for 2 years from date of selection which may be renewed for maximum of two years subject to recommendations of GM (ATM) of the Airport or GM (ATM-Region) for field stations not headed by GM (ATM) and approved by ED (ATM).

CHAPTER 4

AIR TRAFFIC SERVICES

4.1 Objectives of the air traffic services

4.1.1 The objectives of the air traffic services shall be to:

a) prevent collisions between aircraft;
b) prevent collisions between aircraft on the manoeuvring 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.

4.2 Divisions of the air traffic services

4.2.1 The air traffic services shall comprise of three services identified as follows:

4.2.1.1 Air traffic control service

4.2.1.1.1 The air traffic control *service*, to accomplish following objectives:

a) prevent collisions between aircraft;
b) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;
c) expedite and maintain an orderly flow of air traffic;

4.2.1.1.2 Air traffic control services have been divided into three parts as follows:

4.2.1.1.2.1 **Area control service**

4.2.1.1.2.1.1 The provision of air traffic control service for controlled flights, except for those parts of such flights which are under the jurisdiction of Approach Control or Aerodrome Control to accomplish following objectives:

a) prevent collisions between aircraft;
b) expedite and maintain an orderly flow of air traffic;

4.2.1.1.2.2 **Approach control service**

4.2.1.1.2.2.1 The provision of air traffic control service for those parts of controlled flights associated with arrival or departure, in order to accomplish following objectives:

a) prevent collisions between aircraft;
b) expedite and maintain an orderly flow of air traffic;

4.2.1.1.2.3 **Aerodrome control service***:*

4.2.1.1.2.3.1 The provision of air traffic control service for aerodrome traffic, except for those parts of flights which are under the jurisdiction of Approach Control to accomplish the following objectives:

a) prevent collisions between aircraft;

b) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;

c) expedite and maintain an orderly flow of air traffic;

4. 2.1.2 Flight information service

4.2.1.2.1 *The flight information service, to accomplish the following objective:*

Provide advice and information useful for the safe and efficient conduct of flights.

4.2.1.3 Alerting service

4.2.1.3.1 *The alerting service to accomplish the following objective:*

Notify appropriate organizations regarding aircraft in need of search and rescue aid and assist such organizations as required.

4.3 Classification of airspaces

4.3.1 ATS airspaces are classified and designated in accordance with 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 Special VFR flights and receive traffic information in respect of VFR flights. VFR flights receive traffic information in respect of all other flights. Airspaces in terminal areas, control areas, control zones and aerodrome traffic zones have been classified and designated as class D airspace.

Class E: IFR and VFR flights are permitted; IFR flights are provided with air traffic control service and are separated from other IFR flights. IFR flights receive traffic information in respect of VFR flights; VFR flights receive traffic information in respect of all other flights, as far as is practical. Class E is not be used for control zones. Airspaces in designated ATS routes outside terminal areas, control areas and control zones, where air traffic control service is provided, have been classified and designated as class E airspace.

Class F: IFR and VFR flights are permitted. All IFR flights receive an air traffic advisory service and all flights receive flight information service, if requested. Airspaces in designated ATS route segments outside terminal areas, control areas and control zones, where air traffic advisory service is provided, have been classified and designated as class F airspace.

Class G: IFR and VFR flights are permitted and receive flight information service if requested. Airspaces other than those in Class D, E and F have been classified and designated as class G airspace.

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.

4.3.2 Requirements for flights within each class of airspace are shown in Table 4-1.

4.4 Application of air traffic control service

4.4.1 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.

4.5 Provision of air traffic control service

4.5.1 Area control service

4.5.1.1 Area control service shall be provided:

a) by an area control centre (ACC); or
b) 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, when no ACC is established.

4.5.2 Approach control service

4.5.2.1 Approach control service shall be provided:

a) by an aerodrome control tower or an ACC, when it is necessary or desirable to combine under the responsibility of one unit the functions of the approach control service and those of the aerodrome control service or the area control service; or
b) by an approach control unit, when it is established as a separate unit.

4.5.3 Aerodrome control service

4.5.3.1 Aerodrome control service shall be provided by an aerodrome control tower.

4.6 Operation of air traffic control service

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

a) be provided with information on the intended movement of each aircraft, or variations therefrom, and with current information on the actual progress of each aircraft;
b) determine from the information received, the relative positions of known aircraft to each other;
c) issue clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic;
d) coordinate clearances as necessary with other units:
    1) whenever an aircraft might otherwise conflict with traffic operated under the control of such other units;

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

4.6.2 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.

4.7 Responsibility for control

4.7.1 Responsibility for control of individual flights

4.7.1.1 A controlled flight shall be under the control of only one air traffic control unit at any given time.

4.7.2 Responsibility for control within a given block of airspace

4.7.2.1 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.

4. 8 Transfer of responsibility for control

4.8.1 Place or time of transfer

4.8.1.1 *Between a unit providing aerodrome control service and a unit providing approach control service*

4.8.1.1.1 Except for flights which are provided aerodrome control service only, the control of arriving and departing controlled flights shall be divided between units providing aerodrome control service and units providing approach control service as follows:

4.8.1.1.1.1 *Arriving aircraft*:

4.8.1.1.1.1.1 The responsibility of control of an arriving aircraft shall be transferred from the unit providing approach control service to the unit providing aerodrome control service 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) has reached uninterrupted visual meteorological conditions, or
b) is at a prescribed point or level, or
c) has landed,

as specified in MATS- Part 2.

4.8.1.1.1.1.2 Transfer of communications to the aerodrome controller should be effected at such a point, level or time that clearance to land or alternative instructions, as well as information on essential local traffic, can be issued in a timely manner.

4.8.1.1.1.2 *Departing aircraft.*

4.8.1.1.1.2.1 The responsibility for the control of a departing aircraft shall be transferred from the unit providing aerodrome control service 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) when the aircraft is at a prescribed point or level, as specified in MATS- Part 2;
b) when instrument meteorological conditions prevail at the aerodrome:
   1) immediately after the aircraft is airborne, or
   2) when the aircraft is at a prescribed point or level, as specified in MATS- Part 2;

4.8.1.2 *Between a unit providing approach control service and a unit providing area control service*

4.8.1.2.1 When area control service and approach control service are not provided by the same air traffic control unit, responsibility for controlled flights shall rest with the unit providing area control service except that a unit providing approach control service shall be responsible for the control of:

a) arriving aircraft that have been released to it by the ACC;
b) departing aircraft until such aircraft are released to the ACC.

4.8.1.2.2 A unit providing approach control service shall assume control of arriving aircraft, provided such aircraft have been released to it, upon arrival of the aircraft at the point, level or time agreed for transfer of control, and shall maintain control during approach to the aerodrome.

4.8.1.3 *Between two units providing area control service*

4.8.1.3.1 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 ACC having control of the aircraft or at such other point, level or time specified in Letter of Agreement (LOA); or as has been agreed between the two units.

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

4.8.1.4 The responsibility for the control of an aircraft shall be transferred from one control sector/position to another control sector/position within the same ATC unit at a point, level or time, as specified in MATS- Part 2.

4.9 Responsibilities for the provision of flight information service and alerting service

4.9.1 Flight information service and alerting service are provided as follows:

a. *within a flight information region (FIR):* by a flight information centre, unless the responsibility for providing such services is assigned to an air traffic control unit having adequate facilities for the exercise of such responsibilities;
b. *within controlled airspace and at controlled aerodromes:* by the relevant air traffic control units.

4.10 Time in air traffic services

4.10.1 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.

4.10.2 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.

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

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

4.10.5 Aerodrome control towers shall, prior to an aircraft taxiing for take-off, provide the pilot with the correct time. 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.

4.11 Air traffic control clearances

4.11.1 Scope and purpose

4.11.1.1 Clearances are issued solely for expediting and separating air traffic and are based on known traffic conditions which affect safety in aircraft operation. Such traffic conditions include not only aircraft in the air and on the manoeuvring area over which control is being exercised, but also any vehicular traffic or other obstructions not permanently installed on the manoeuvring area in use.

4.11.1.2 If an air traffic control clearance is not suitable to the pilot-in-command of an aircraft, the flight crew may request and, if practicable, obtain an amended clearance.

4.11.1.3 The issuance of air traffic control clearances by air traffic control units constitutes authority for an aircraft to proceed only in so far as known air traffic is concerned. ATC clearances do not constitute authority to violate any applicable regulations for promoting the safety of flight operations or for any other purpose; neither do clearances relieve a pilot-in-command of any responsibility whatsoever in connection with a possible violation of applicable rules and regulations.

4.11.1.4 ATC units shall issue such ATC clearances as are necessary to prevent collisions and to expedite and maintain an orderly flow of air traffic.

4.11.1.5 ATC clearances must be issued early enough to ensure that they are transmitted to the aircraft in sufficient time for it to comply with them.

4.11.2 Aircraft subject to ATC for part of flight

4.11.2.1 When a flight plan specifies that the initial portion of a flight will be uncontrolled, and that the subsequent portion of the flight will be subject to ATC, the aircraft shall be advised to obtain its clearance from the ATC unit in whose area controlled flight will be commenced.

4.11.2.2 When a flight plan specifies that the first portion of a flight will be subject to ATC, and that the subsequent portion will be uncontrolled, the aircraft shall normally be cleared to the point at which the controlled flight terminates.

4.11.3 Flights through intermediate stops

4.11.3.1 When an aircraft files, at the departure aerodrome, flight plans for the various stages of flight through intermediate stops, the initial clearance limit will be the first destination aerodrome and new clearances shall be issued for each subsequent portion of flight.

4.11.3.2 The flight plan for the second stage, and each subsequent stage, of a flight through intermediate stops will become active for ATS and search and rescue (SAR) purposes only when the appropriate ATS unit has received notification that the aircraft has departed from the relevant departure aerodrome, except as provided for in 4.11.3.3.

4.11.3.3 By prior arrangement between ATC units and the operators, aircraft operating on an established schedule may if the proposed route of flight is through more than one control area, be cleared through intermediate stops within other control areas but only after coordination between the ACCs concerned.

4.11.4 Contents of clearances

4.11.4.1 Clearances shall contain positive and concise data and shall, as far as practicable, be phrased in a standard manner.

4.11.4.2 Clearances shall contain the following in the order listed:

a) aircraft identification as shown in the flight plan;
b) clearance limit;
c) route of flight;
d) level(s) of flight for the entire route or part thereof and changes of levels if required;

Note.— If the clearance for the levels covers only part of the route, it is important for the air traffic control unit to specify a point to which the *part of the clearance regarding levels applies whenever necessary to ensure compliance with 15.3.3 b) subsection 1) of this manual.*

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

Note.— The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not been started.

4.11.5 Departing aircraft

4.11.5.1 ACCs shall forward a clearance to approach control units or aerodrome control towers with the least possible delay after receipt of request made by these units, or prior to such request if practicable.

4.11.6 En-route aircraft

4.11.6.1 An ATC unit may request an adjacent ATC unit to clear aircraft to a specified point during a specified period.

4.11.6.2 After the initial clearance has been issued to an aircraft at the point of departure, it will be the responsibility of the appropriate ATC unit to issue an amended clearance whenever necessary and to issue traffic information, if required.

4.11.7 Description of air traffic control clearances

4.11.7.1 C*learance Limit*

a) A clearance limit shall be described by specifying the name of the appropriate significant point, or aerodrome, or controlled airspace boundary.

b) When prior coordination has been effected with units under whose control the aircraft will subsequently come, or if there is reasonable assurance that it can be effected a reasonable time prior to their assumption of control, the clearance limit shall be the destination aerodrome or, if not practicable, an appropriate intermediate point, and coordination shall be expedited so that a clearance to the destination aerodrome may be issued as soon as possible.

c) If an aircraft has been cleared to an intermediate point in adjacent controlled airspace, the appropriate ATC unit will then be responsible for issuing, as soon as practicable, an amended clearance to the destination aerodrome.

d) When the destination aerodrome is outside controlled airspace, the ATC unit responsible for the last controlled airspace through which an aircraft will pass shall issue the appropriate clearance for flight to the limit of that controlled airspace.

4.11.7.2 *Route of Flight*

a) The route of flight shall be detailed in each clearance when deemed necessary. The phrase "cleared flight planned route" may be used to describe any route or portion thereof, provided the route or portion thereof is identical to that filed in the flight plan and sufficient routing details are given to definitely establish the aircraft on its route. The phrases "cleared via (designation) departure" or "cleared (designation) arrival" may be used when standard departure or arrival routes have been established and published in Aeronautical Information Publication (AIP).

b) The phrase "cleared flight planned route" shall not be used when granting a re-clearance.

c) Subject to airspace constraints, ATC workload and traffic density, and provided coordination can be effected in a timely manner, an aircraft should whenever possible be offered the most direct routing.

4.11.7.3 *Levels:* Instructions included in clearances relating to levels shall consist of:

a) cruising level(s),and if necessary, the point to which the clearance is valid with regard to the level(s);

b) levels at which specified significant points are to be crossed, when necessary;

c) the place or time for starting climb or descent, when necessary;

d) the rate of climb or descent, when necessary;

e) detailed instructions concerning departure or approach levels, when necessary.

4.11.7.4 *Clearance of a requested change in flight plan*

a) When issuing a clearance covering a requested change in route or level, the exact nature of the change shall be included in the clearance.

b) fic conditions will not permit clearance of a requested change, the word "UNABLE" shall be used. When warranted by circumstances, an alternative route or level should be offered.

c) When an alternative route is offered and accepted by the flight crew under the procedures described in 4.11.7.4 (b) the amended clearance issued shall describe the route to the point where it joins the previously cleared route, or, if the aircraft will not re-join the previous route, to the destination.

4.11.7.5 *Read-back of clearances*

4.11.7.5.1 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, taxi 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 automatic terminal information service (ATIS) broadcasts, transition levels.

Note.— If the level of an aircraft is reported in relation to standard pressure 1013.2 hPa, the words "FLIGHT LEVEL" precede the level figures. If the level of the aircraft is reported in relation to QNH/QFE, the figures are followed by the word "FEET", as appropriate.

4.11.7.5.2 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.

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

4.11.7.5.4 Transfer of communication shall be segregated from instructions requiring read back by the flight crew and therefore, transmitted separately.

4.11.7.5.5 Voice read-back of controller-pilot data link communications (CPDLC) messages shall not be required.

4.12 Horizontal speed control instructions

4.12.1 General

4.12.1.1 In order to facilitate a safe and orderly flow of traffic, aircraft may, subject to consideration of aircraft performance limitations, be instructed to adjust speed in a specified manner. Flight crews should be given adequate notice of planned speed control.

Note.- Application of speed control over a long period of time may affect aircraft fuel reserves.

4.12.1.2. Speed Control instructions shall remain in effect unless explicitly cancelled or amended by the controller.

Note.- Cancellation of any speed control instruction does not relieve the flight crew of compliance with speed limitations associated with airspace classifications as specified in Appendix 4, Civil Aviation Requirements Section 9 Series 'E' Part I. .

4.12.1.3 Speed control shall not be applied to aircraft entering or established in a holding pattern.

4.12.1.4 Speed adjustments should be limited to those necessary to establish and/or maintain a desired separation minimum or spacing. Instructions involving frequent changes of speed, including alternate speed increases and decreases, should be avoided.

4.12.1.5 The flight crew shall inform the ATC unit concerned if at any time they are unable to comply with a speed instruction. In such cases, the controller shall apply an alternative method to achieve the desired spacing between the aircraft concerned.

4.12.1.6 At levels at or above FL 250, speed adjustments should be expressed in multiples of 0.01 Mach; at levels below FL 250, speed adjustments should be expressed in multiples 10 knots based on indicated airspeed (IAS).

Note 1.— Mach 0.01 equals approximately 6 kt IAS at higher flight levels.

Note 2.— When an aircraft is heavily loaded and at a high level, its ability to change speed may, in cases, be very limited.

4.12.1.7 Aircraft are required to follow following speed control restrictions under procedural control:

a) All aircraft (including arrivals and departures) operating below 10,000 feet, to fly IAS not greater than 250 knot.

b) All arriving aircraft operating below 10,000 feet, within 15 NM radius of VOR / DME serving the aerodrome to fly IAS not greater than 220 knot.

Note: ATC may suspend speed control by using the phrase 'NO ATC SPEED RESTRICTION' when traffic conditions permit.

4.12.1.8 Aircraft shall be advised when a speed control restriction is no longer required by using following phraseologies:

➢ RESUME NORMAL SPEED, or ➢ RESUME PUBLISHED SPEED, or

➢ NO [ATC] SPEED RESTRICTIONS.

4.12.2 Methods of application

4.12.2.1 In order to establish a desired spacing between two or more successive aircraft, the controller should first reduce the speed of the last aircraft, or increase the speed of the lead aircraft, then adjust the speed(s) of the other aircraft in order.

4.12.2.2 In order to maintain a desired spacing using speed control techniques, specific speeds need to be assigned to all the aircraft concerned.

4.12.2.3 The controller should consider the following when applying the speed control:

a) Determine the interval required and the point at which the interval is to be accomplished.

b) Implement the speed adjustment based on the following principles:

- Priority of speed adjustment instructions is determined by relative speed and position of the aircraft involved and the spacing requirement.
- Speed adjustments are not achieved instantaneously. Aircraft configuration, altitudes, and speed determine the time and distance required for accomplishing the adjustment.

c) Allow increased time and distance to achieve speed adjustments in the following situations:

- Higher altitudes
- Greater speed
- Clean configurations

a) Ensure that aircraft are allowed to operate in a clean configuration as long as circumstances permit.
b) Ground speed may vary with altitude. Therefore, when assigning speeds to achieve spacing between aircraft at different altitudes, further speed adjustment may be necessary to attain the desired spacing.

Note 1.— The true airspeed (TAS) of an aircraft will decrease during descent when maintaining a constant IAS. When two descending aircraft maintain the same IAS, and the leading aircraft is at the lower level, the TAS of the leading aircraft will be lower than that of the following aircraft. The distance between the two aircraft will thus be reduced, unless a sufficient speed differential is applied. For the purpose of calculating a desired speed differential between two succeeding aircraft, 6 kt IAS per 1 000 ft height difference may be used as a general rule. At levels below FL 80 the difference between IAS and TAS is negligible for speed control purposes.

Note 2.— Time and distance required to achieve a desired spacing will increase with higher levels, higher speeds and when the aircraft is in a clean configuration.

4.12.3 Descending and arriving aircraft

4.12.3.1 An aircraft should, when practicable, be authorized to absorb a period of notified terminal delay by cruising at a reduced speed for the latter portion of its flight.

4.12.3.2 An arriving aircraft may be instructed to maintain its “maximum speed”, “minimum clean speed”, “minimum speed”, or a specified speed.

Note.— “Minimum clean speed” signifies the minimum speed at which an aircraft can be flown in a clean configuration, i.e. without deployment of lift-augmentation devices, speed brakes or landing gear.

4.12.3.3 Speed reductions to less than 250 knots IAS for turbojet aircraft during initial descent from cruising level should be applied only with the concurrence of the flight crew.

4.12.3.4 Instructions for an aircraft to simultaneously maintain a high rate of descent and reduce its speed should be avoided as such manoeuvres are normally not compatible. Any significant speed reduction during descent may require the aircraft to temporarily level off to reduce speed before continuing descent. The controller should specify the action which is expected first when combining speed reduction with a descent clearance as follows:

a) Speed reduction prior to descent, e.g.

- REDUCE SPEED TO *(number)* KNOTS, THEN DESCEND TO *(level)*
- REDUCE SPEED BY *(number)* KNOTS, THEN DESCEND TO *(level)*

b) Speed reduction subsequent to descent

- DESCEND TO *(level),* THEN REDUCE SPEED TO *(number)* KNOTS
- DESCEND TO *(level),* THEN REDUCE SPEED TO MACH *(number)*
- DESCEND TO *(level),,* THEN REDUCE SPEED BY *(number)* KNOTS

Note: It may be necessary for the pilot to level off temporarily and reduce speed prior to descending below F100.

4.12.3.5 Arriving aircraft should be permitted to operate in a clean configuration for as long as possible. Below FL 150, speed reductions for turbojet aircraft to not less than 220 knots IAS, which will normally be very close to the minimum speed of turbojet aircraft in a clean configuration, may be used.

4.12.3.6 Only minor speed adjustments not exceeding plus/minus 20 knots IAS should be used for aircraft on intermediate and final approach.

4.12.3.7 Speed control should not be applied to aircraft

a) after passing a point 5 NM from the threshold on final approach;
b) carrying out Cat II / Cat III A/B ILS approach within 20 NM from touchdown.

4.12.4 SID and STAR

4.1.2.4.1 The flight crew shall comply with published SID and STAR speed restrictions unless the restrictions are explicitly cancelled or amended by the controller.

Note 1.— Some SID and STAR speed restrictions ensure containment with RNAV departure or arrival procedure (e.g. maximum speed associated with a constant radius arc to a fix (RF) leg).

4.12.4.2 Clearance to cancel the speed restriction of a SID during a climb shall be passed to an aircraft using the following phraseologies meaning of which are given in 6.3.2.4.1:

- [CLIMB VIA SID TO *(level)*], CANCEL SPEED RESTRICTION(S), or
- [CLIMB VIA SID TO *(level)*], CANCEL SPEED RESTRICTION(S) AT *(point(s)),* or
- CLIMB UNRESTRICTED TO *(level)* (*or)* CLIMB TO *(level),* CANCEL LEVEL AND SPEED RESTRICTIONS.

4.12.4.3 Clearance to climb on a SID which has published level and/or speed restrictions, where the pilot is to climb to the cleared level and comply with published level restrictions, follow the lateral profile of the SID; and comply with published speed restrictions or ATC issued speed control instructions as applicable; shall be passed to an aircraft using the following phraseology:

- CLIMB VIA SID TO *(level)*

Note: See also 6.3.2.4 for Clearances on a SID

4.12.4.4 Clearance to cancel the speed restriction of a STAR during a descent shall be passed to an aircraft using the following phraseologies meaning of which are given in 6.5.2.4.1:

- [DESCEND VIA STAR TO *(level)*], CANCEL SPEED RESTRICTION(S), or
- [DESCEND VIA STAR TO *(level)*], CANCEL SPEED RESTRICTION(S) AT (*point(s)*), or
- DESCEND UNRESTRICTED TO *(level) or* DESCEND TO *(level),* CANCEL LEVEL AND SPEED RESTRICTIONS

4.12.4.5 Clearance to descend on a STAR which has published level and/or speed restrictions, where the pilot is to descend to the cleared level and comply with published level restrictions, follow the lateral profile of the STAR and comply with published speed restrictions or ATC issued speed control instructions; shall be passed to an aircraft using the following phraseology:

- DESCEND VIA STAR TO *(level)*

Note: See also 6.5.2.4 for Clearances on a STAR

4.13 VERTICAL SPEED CONTROL INSTRUCTIONS

4.13.1 General

4.13.1.1 In order to facilitate a safe and orderly flow of traffic, aircraft may be instructed to adjust rate of climb or rate of descent. Vertical speed control may be applied between two climbing aircraft or two descending aircraft in order to establish or maintain a specific vertical separation minimum.

4.13.1.2 Vertical speed adjustments should be limited to those necessary to establish and/or maintain a desired separation minimum. Instructions involving frequent changes of climb/descent rates should be avoided.

4.13.1.3 The flight crew shall inform the ATC unit concerned if unable, at any time, to comply with a specified rate of climb or descent. In such cases, the controller shall apply an alternative method to achieve an appropriate separation minimum between aircraft, without delay.

4.13.1.4 Aircraft shall be advised when a rate of climb/descent restriction is no longer required.

4.13.2 Methods of application

4.13.2.1 An aircraft may be instructed to expedite climb or descent as appropriate to or through a specified level, or may be instructed to reduce its rate of climb or rate of descent.

4.13.2.2 Climbing aircraft may be instructed to maintain a specified rate of climb, a rate of climb equal to or greater than a specified value or a rate of climb equal to or less than a specified value.

4.13.2.3 Descending aircraft may be instructed to maintain a specified rate of descent, a rate of descent equal to or greater than a specified value or a rate of descent equal to or less than a specified value.

4.13.2.4 In applying vertical speed control, the controller should ascertain to which level(s) climbing aircraft can sustain a specified rate of climb or, in the case of descending aircraft, the specified rate of descent which can be sustained, and shall ensure that alternative methods of maintaining separation can be applied in a timely manner, if required.

Note 1.— Controllers need to be aware of aircraft performance characteristics and limitations in relation to a simultaneous application of horizontal and vertical speed limitations.

Note 2.— Controllers should keep in mind the rate of climb / descent restrictions specified in 'DGCA Operations Circular No. 7 of 2010 dated 23rd February 2010' while applying the vertical speed control. As per this circular, to reduce false TCAS RA, crew must reduce the aircraft rate of climb or descent as applicable to 1500 feet per minute or less when the airplane is 1000 feet to level off altitude.

4.14 CHANGE FROM IFR TO VFR FLIGHT

4.14.1 Change from instrument flight rules (IFR) flight to visual flight rules (VFR) flight is only acceptable when a message initiated by the pilot-in-command containing the specific expression "CANCELLING MY IFR FLIGHT", together with the changes, if any, to be made to the current flight plan, is received by an air traffic services unit. No invitation to change from IFR flight to VFR flight is to be made either directly or by inference.

4.14.2 No reply, other than the acknowledgment "IFR FLIGHT CANCELLED AT ... (time)", should normally be made by an air traffic services unit.

4.14.3 When an ATS unit is in possession of information that instrument meteorological conditions are likely to be encountered along the route of flight, a pilot changing from IFR flight to VFR flight should, if practicable, be so advised in following manner:

INSTRUMENT METEOROLOGICAL CONDITIONS REPORTED *(or forecast)* IN THE VICINITY OF *(location)"*.

4.14.4 An ATC unit receiving notification of an aircraft's intention to change from IFR to VFR flight shall, as soon as practicable thereafter, so inform all other ATS units to whom the IFR flight plan was addressed, except those units through whose regions or areas the flight has already passed.

4.15 ALTIMETER SETTING PROCEDURES

4.15.1 Expression of vertical position of aircraft

4.15.1.1 For flights in the vicinity of aerodromes and within terminal control areas the vertical position of aircraft shall be expressed in terms of altitudes at or below the transition altitude and in terms of flight levels at or above the transition level. While passing through the transition layer, vertical position shall be expressed in terms of flight levels when climbing and in terms of altitudes when descending.

4.15.1.2 For flights en route the vertical position of aircraft shall be expressed in terms of:

a) flight levels at or above the lowest usable flight level;
b) altitudes below the lowest usable flight level.

4.15.2 Determination of the transition level

4.15.2.1 The appropriate ATS unit shall establish the transition level to be used in the vicinity of the aerodrome(s) concerned.

4.15.2.2 The transition level shall be the lowest flight level available for use above the transition altitude established for the aerodrome(s) concerned. Where a common transition altitude has been established for two or more aerodromes which are so closely located as to require coordinated procedures, the appropriate ATS units shall establish a common transition level to be used at any given time in the vicinity of the aerodrome.

4.15.3 Minimum cruising level for IFR flights

4.15.3.1 Cruising levels below the established minimum flight altitudes shall not be assigned.

4.15.4 Provision of altimeter setting information

4.15.4.1 The flight crew shall be provided with the transition level in due time prior to reaching it during descent.

This may be accomplished by voice communications, ATIS broadcast or data link.

4.15.4.2 The transition level shall be included in approach clearances or when requested by the pilot.

4.15.4.3 A QNH altimeter setting shall be included in the descent clearance when first cleared to an altitude below the transition level, in approach clearances or clearances to enter the traffic circuit, and in taxi clearances for departing aircraft, except when it is known that the aircraft has already received the information.

4.16 ACCEPTANCE OF A FLIGHT PLAN

4.16.1 The first ATS unit receiving a flight plan, or change thereto, shall:

a. check it for compliance with the format and data conventions;
b. check it for completeness and, to the extent possible, for accuracy;
c. take action, if necessary, to make it acceptable to the air traffic services; and
d. indicate acceptance of the flight plan or change thereto, to the originator.

4.17 DATA LINK COMMUNICATIONS INITIATION PROCEDURES

4.17.1 General

4.17.1.1 Before entering an airspace where data link applications are used by the ATS unit, data link communications shall be initiated between the aircraft and the ATS unit in order to register the aircraft and, when necessary, allow the start of a data link application. This shall be initiated by the aircraft, either automatically or by the pilot, or by the ATS unit on address forwarding.

4.17.2 **Aircraft initiation**

4.17.2.1 On receipt of a valid data link initiation request from an aircraft approaching or within a data link service area, the ATS unit except the request and, if able to correlate it with a flight plan, shall establish a connection with the aircraft.

4.17.3 **ATS unit forwarding**

4.17.3.1 Where the ground system initially contacted by the aircraft is able to pass the necessary aircraft address information to another ATS unit, it shall pass the aircraft updated ground addressing information for data link applications previously coordinated in sufficient time to permit the establishment of data link communications.

4.17.4 **Failure**

4.17.4.1 In the case of a data link initiation failure, the data link system shall provide an indication of the failure to the appropriate ATS unit(s). The data link system shall also provide an indication of the failure to the flight crew when a data link initiation failure results from a logon initiated by the flight crew.

Note.-When the aircraft's logon request results from responding to a contact request by a transferring ATS unit, then both ATS units will receive the indication.

4.17.4.2 The ATS unit shall establish procedures to resolve, as soon as practicable, data link initiation failures. Procedures should include, as a minimum, verifying that the aircraft is initiating a data link request with the appropriate ATS unit (i.e. the aircraft is approaching or within the ATS unit's control area), and if so:

a) when a flight plan is available, verify that the aircraft identification, aircraft registration, or aircraft address and other details contained in the data link initiation request correspond with details in the flight plan, and where differences are detected verify the correct information and make the necessary changes; or
b) when a flight plan is not available, create a flight plan with sufficient information in the flight data processing system, to achieve a successful data link initiation; then
c) arrange for the re-initiation of the data link.

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

TABLE 4-1: ATS AIRSPACE CLASSES IN INDIA

CHAPTER 5

SEPARATION METHODS AND MINIMA

5.1 Provision for the separation of controlled traffic

5.1.1 General

5.1.1.1 Vertical or horizontal separation shall be provided:

a) between IFR flights in Class D and E airspaces except when VMC climb or descent is involved under the conditions specified in para 5.4.6;

b) between IFR flights and special VFR flights; and

c) between special VFR flights

5.1.1.2 No clearance shall be given to execute any manoeuvre that would reduce the spacing between two aircraft to less than the separation minimum applicable in the circumstances.

5.1.1.3 Larger separations than the specified minima should be applied whenever exceptional circumstances such as unlawful interference or navigational difficulties call for extra precautions. This should be done with due regard to all relevant factors so as to avoid impeding the flow of air traffic by the application of excessive separations.

Note — Unlawful interference with an aircraft constitutes a case of exceptional circumstances which might require the application of separations larger than the specified minima, between the aircraft being subjected to unlawful interference and other aircraft.

5.1.1.4 Where the type of separation or minimum used to separate two aircraft cannot be maintained, another type of separation or another minimum shall be established prior to the time when the current separation minimum would be infringed.

5.1.2 Degraded aircraft performance

5.1.2.1 Whenever, as a result of failure or degradation of navigation, communications, altimetry, flight control or other systems, aircraft performance is degraded below the level required for the airspace in which it is operating, the flight crew shall advise the ATC unit concerned without delay. Where the failure or degradation affects the separation minimum currently being employed, the controller shall take action to establish another appropriate type of separation or separation minimum.

5.2 Loss of separation

5.2.1 If, for any reason, a controller is faced with a situation in which two or more aircraft are separated by less than the prescribed minima due to reason other than ACAS RA (e.g. air traffic control errors or difference in the pilot's estimated and actual times over reporting points) controller is to

a) use every means at his disposal to obtain the required minimum with the least possible delay; and

b) pass essential traffic information.

5.3 Essential traffic information

5.3.1 Essential traffic is that controlled traffic to which the provision of separation by ATC is applicable, but which, in relation to a particular controlled flight is not, or will not be, separated from other controlled traffic by the appropriate separation minimum.

5.3.2 Essential traffic information shall be given to controlled flights concerned whenever they constitute essential traffic to each other.

5.3.3 Essential traffic information shall include:

a) direction of flight of aircraft concerned;

b) type and wake turbulence category(if relevant) of aircraft concerned;

c) cruising level of aircraft concerned and;

   i) estimated time over the reporting point nearest to where the level will be crossed; or

   ii) relative bearing of the aircraft concerned in terms of the 12-hour clock as well as distance from the conflicting traffic; or

   iii) actual or estimated position of the aircraft concerned.

5.4 Vertical separation

5.4.1 Vertical Separation Minimum

a) A nominal 1000 feet below FL290 and a nominal 2000 feet at or above FL290, except as provided for in b) below; and

b) A nominal 1000 feet when both aircraft are RVSM compliant and operating within designated RVSM airspace.

5.4.2 Assignment of cruising levels for controlled flights

Note: Cruise climb is not permitted in Indian FIRs

5.4.2.1 If it is necessary to change the cruising level of an aircraft operating along an established ATS route extending partly within and partly outside controlled airspace and where the respective series of cruising levels are not identical, the change shall, whenever possible, be effected within controlled airspace.

5.4.2.2 When an aircraft has been cleared into a control area at a cruising level which is below the established minimum cruising level for a subsequent portion of the route, the ATC unit responsible for the area should issue a revised clearance to the aircraft even though the pilot has not requested the necessary cruising level change.

5.4.2.3 An aircraft may be cleared to change cruising level at a specified time, place or rate.

5.4.2.4 In so far as practicable, cruising levels of aircraft flying to the same destination shall be assigned in a manner that will be correct for an approach sequence at destination.

5.4.2.5 An aircraft at a cruising level shall normally have priority over other aircraft requesting that cruising level. When two or more aircraft are at the same cruising level, the preceding aircraft shall normally have priority.

5.4.2.6 The cruising levels, or, in the case of cruise climb, the range of levels, to be assigned to controlled flights shall be selected from those allocated to IFR flights in:

a) the tables of cruising levels in Appendix 3 of Annex 2; or

b) a modified table of cruising levels, when so prescribed in accordance with Appendix 3 of Annex 2 for flights above FL 410;

except that the correlation of levels to track as prescribed therein shall not apply whenever otherwise indicated in air traffic control clearances or specified by the appropriate ATS authority in AIPs.

5.4.3 Vertical Separation during climb and descent

5.4.3.1 An aircraft may be cleared to a level previously occupied by another aircraft after the latter has reported vacating it, except when:

a) severe turbulence is known to exist; or

b) the aircraft concerned are entering or established at the same holding pattern; or

c) the difference in aircraft performance is such that less than the applicable separation minimum may result;

in which case such clearance shall be withheld until the aircraft vacating the level has reported at or passing another level separated by the required minimum.

5.4.4 Pilot in direct communication with each other may, with their concurrence, be cleared to maintain a specified vertical separation between their aircraft during ascent or descent.

5.4.5 Step climb and descents

5.4.5.1 The step climb/ descent procedure may be used for simultaneous climb / descent of the aircraft to vertically separated levels provided that the lower/higher aircraft is progressively assigned levels that provide vertical separation with the higher / lower aircraft.

5.4.5.2 When applying the step climb or step descent procedures, pilot must be advised that they are subject to a step climb or descent.

5.4.6 VMC climb and descent

5.4.6.1 When so requested by an aircraft and provided it is agreed by the pilot of the other aircraft, an ATC unit may clear a controlled flight, including departing and arriving flights, operating in airspace Classes D and E in VMC during the hours of daylight to fly subject to maintaining own separation to one other aircraft and remaining in VMC. When a controlled flight is so cleared, the following shall apply:

a) Clearances shall be for a specified portion of the flight at or below 10,000 feet, during climb and descent;

b) Essential traffic information shall be passed; and

c) If there is possibility that flight under VMC may become impracticable, an IFR flight shall be provided with alternative instructions to be complied with in the event that in VMC cannot be maintained for the term of clearance.

5.5 Horizontal separation

5.5.1 Lateral separation

5.5.1.1 Lateral separation Application

5.5.1.1.1 Lateral separation of aircraft is obtained by requiring operation on different routes or in different geographical locations as determined by visual observation, by the use of navigation aids or by the use of area navigation (RNAV) equipment.

5.5.1.1.2 When information is received indicating navigation equipment failure or deterioration below the navigation performance requirements, ATC shall then, as required, apply alternative separation methods or minima.

5.5.1.1.3 When an aircraft turns onto an ATS route via a flyover waypoint, a separation other than the normally prescribed lateral separation shall be applied for that portion of the flight between the flyover waypoint where the turn is executed and the next waypoint (see Figures 5-1 and 5-2).

Note 1.— For flyover waypoints aircraft are required to first fly over the waypoint before executing the turn. After the turn the aircraft may either navigate to join the route immediately after the turn or navigate to the next defined waypoint before re-joining the route. This will require additional lateral separation on the overflown side of the turn.

Note 2.— This does not apply to ATS routes that have turns using fly-by waypoints.

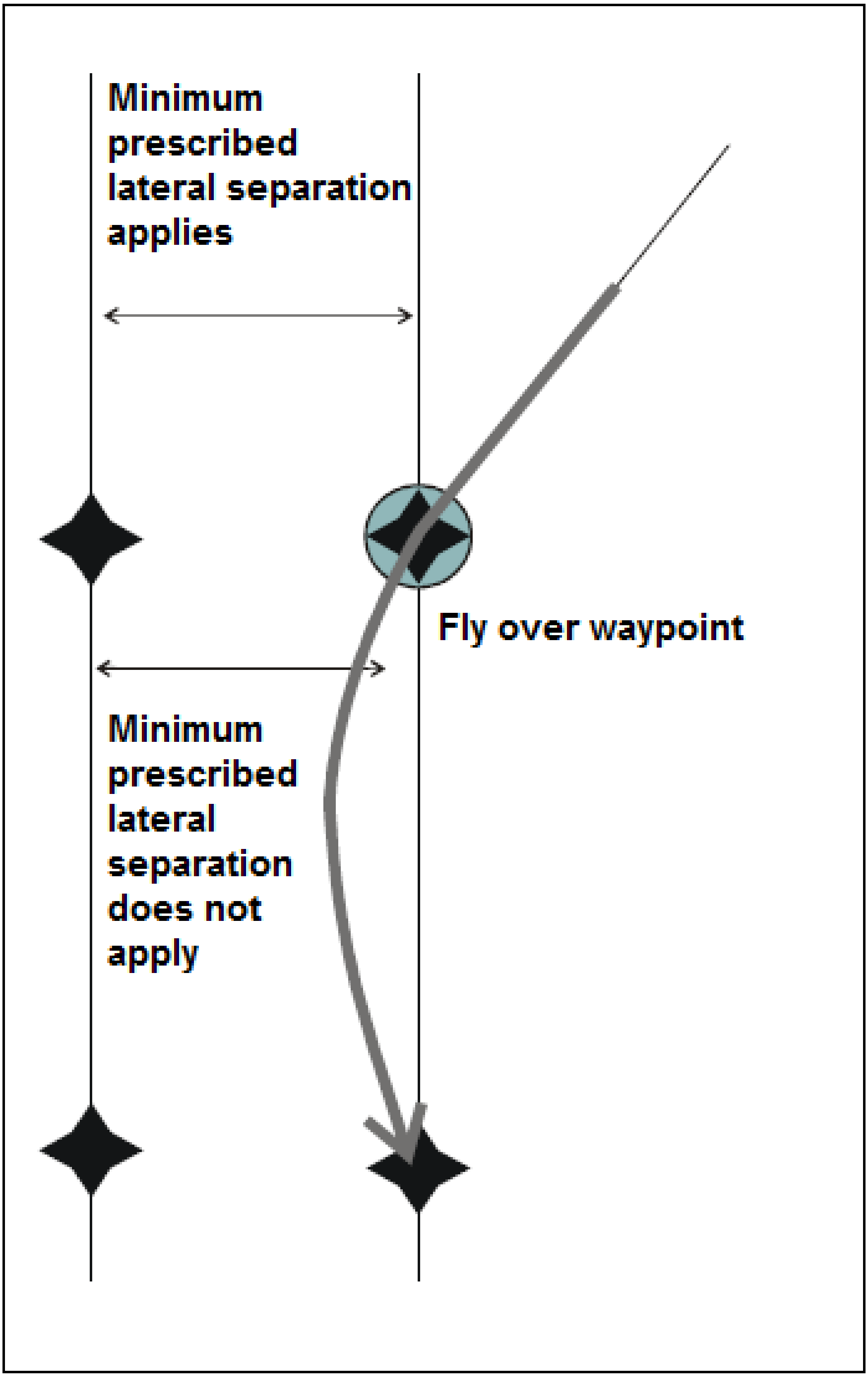


Figure 5-1. Turn over flyover waypoint (See 5.5.1.1.3)

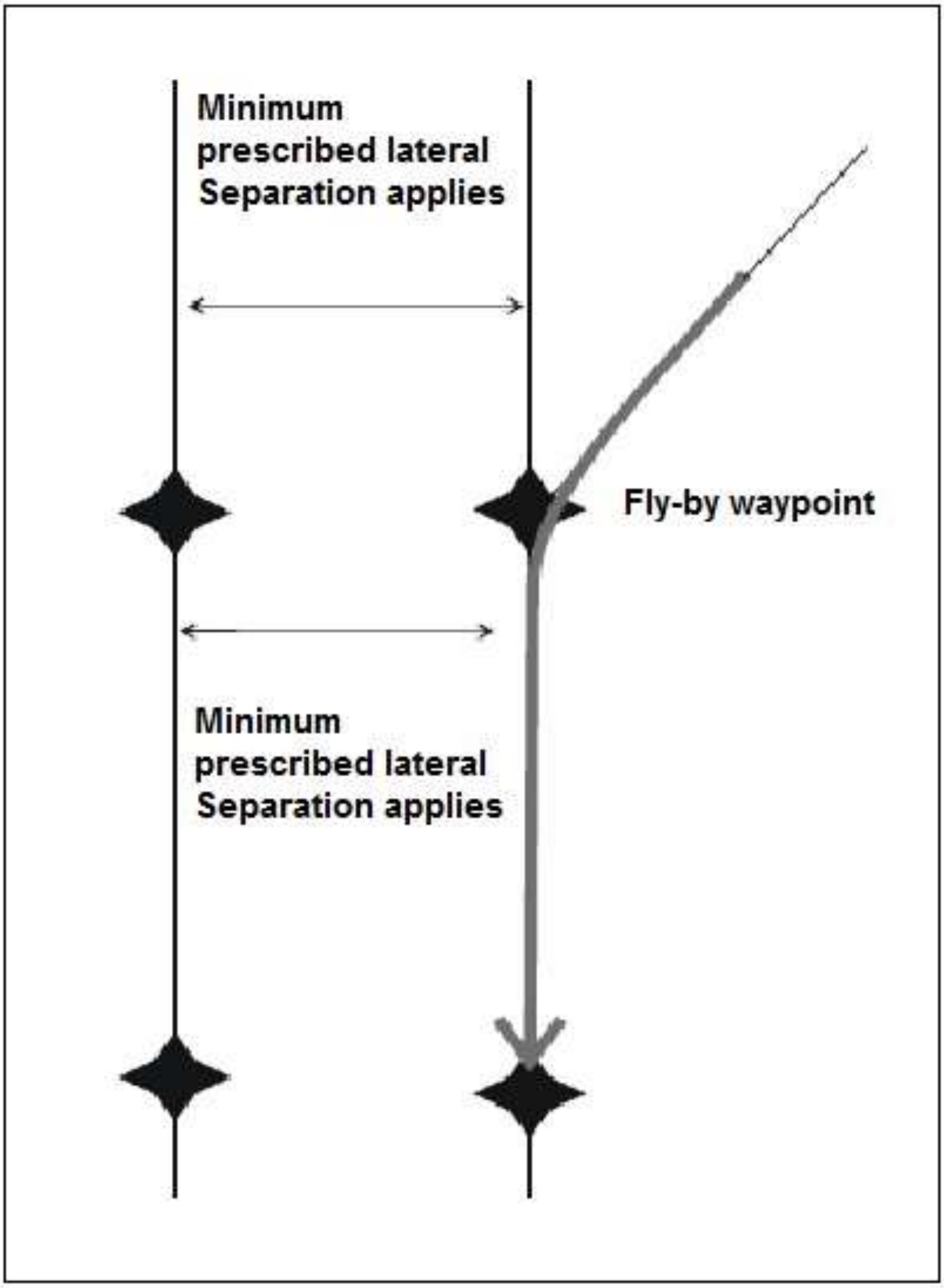


Figure 5-2: Turn at fly-by waypoint (See 5.5.1.1.3)

5.5.1.2 Lateral separation Criteria and minima

5.5.1.2.1 Means by which lateral separation may be applied include the following:

5.5.1.2.1.1 By reference to the same or different geographic locations: By position reports which positively indicate the aircraft are over different geographic locations as determined visually or by reference to a navigation aid.(See figure 5-3)

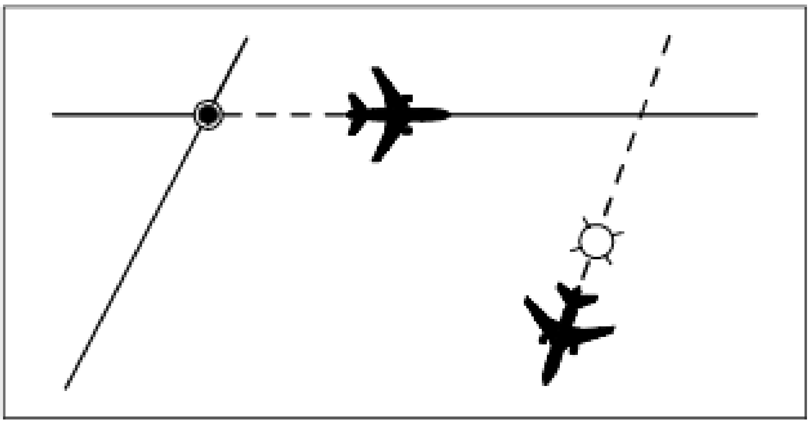


Figure 5-3: Using same or different geographic locations (See 5.5.1.2.1.1)

5.5.1.2.1.2 By use of NDB, VOR or GNSS on intersecting tracks or ATS routes. By requiring aircraft to fly on specified tracks which are separated by a minimum amount appropriate to the navigation aid employed. Lateral separation between two aircraft exists when:

a) VOR: Both aircraft are established on radials diverging by at least 15 degrees and at least one aircraft is 15* NM or more from the facility. (See Figure 5-4)

Note: *- When distance from VOR is based on co-located DME, distance of one aircraft should be at least 17 NM from VOR below FL190 and 18 NM from VOR at or above FL190.

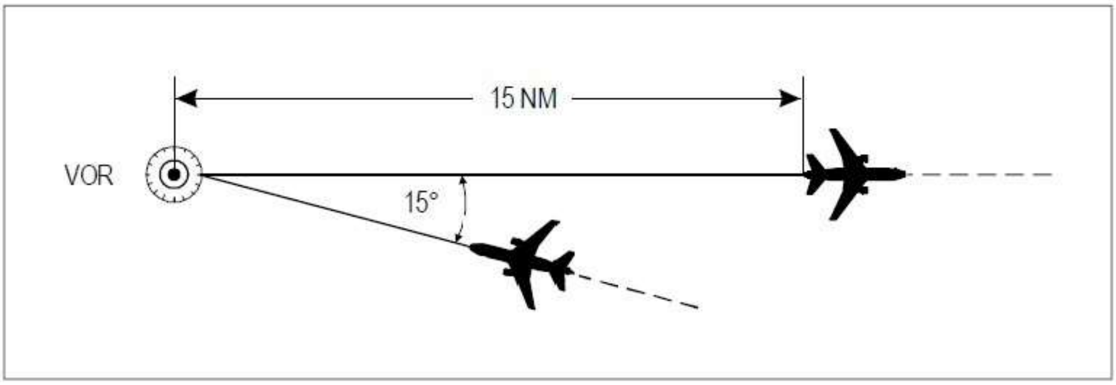


Figure 5-4: Separation using the same VOR [See 5.5.1.2.1.2 a)]

b) NDB: Both aircraft are established on tracks to or from the NDB, which are diverging by at least 30 degrees and at least one aircraft is 15 NM or more from the facility. (See Figure 5-5).

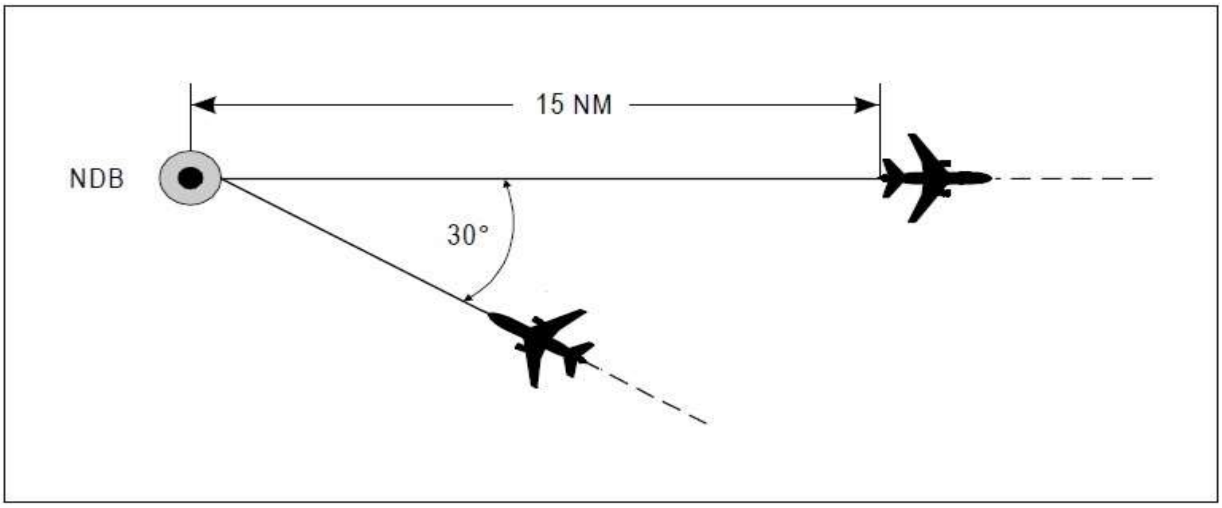


Figure 5-5: Separation using the same NDB [See 5.5.1.2.1.2 b)]

c) **GNSS/GNSS:** each aircraft is confirmed to be established on a track with zero offset between two waypoints and at least one aircraft is at a minimum distance from a common point as specified in Table 5-1; or.

d) **VOR/GNSS:** the aircraft using VOR is established on a radial to or from the VOR and the other aircraft using GNSS is confirmed to be established on a track with zero offset between two waypoints and at least one aircraft is at a minimum distance from a common point as specified in Table 5-1.

Angular difference between tracks measured at the common point	Aircraft 1: VOR or GNSS Aircraft 2: GNSS		
15° – 135°	Limits of level →	FL010 but below FL190	At or above FL190 to FL460
	Distance from a common point	15 NM	23 NM
	When DME is being utilized to provide range information	17 NM	25 NM

Table 5-1: Lateral separation for aircraft flying VOR and GNSS [See 5.5.1.2.1.2 c) & d)]

5.5.1.2.1.2.1 Before applying GNSS-based track separation, the controller shall confirm the following:

a) ensure that the aircraft is navigating using GNSS; and
b) in airspace where strategic lateral offsets are authorized, that a lateral offset is not being applied.

5.5.1.2.1.2.2 In order to minimize the possibility of operational errors, waypoints contained in the navigation database or uplinked to the aircraft flight management system should be used in lieu of manually entered waypoints, when applying GNSS-based track separation. In the event that it is operationally restrictive to use waypoints contained in the navigation database, the use of waypoints that require manual entry by pilots should be limited to a half or whole degree of latitude and longitude.

5.5.1.2.1.2.3 GNSS-based track separation shall not be applied in cases of pilot-reported receiver autonomous integrity monitoring (RAIM) outages.

Note.— For the purpose of applying GNSS-based lateral separation minima, distance and track information derived from an integrated navigation system incorporating GNSS input is regarded as equivalent to GNSS distance and track.

5.5.1.2.1.2.4 GNSS receivers used for applying separation shall meet the requirements in Annex 10, Volume I, and be indicated in the flight plan.

5.5.1.2.1.3 By using crossing radials of the same VOR: When one aircraft is maintaining a radial from a VOR and other aircraft is crossing its track, and after crossing the angular difference of 45° to 135° inclusive, aircraft will be deemed to be laterally separated, when the other aircraft:

a) has passed the radial of first aircraft; and

b) crossed a radial which is different by at least 20° from the radial of first aircraft; and

c) is 20 DME or more from the VOR used by first aircraft.

Note: See Figure 5.6 (a), (b), (c) & (d)

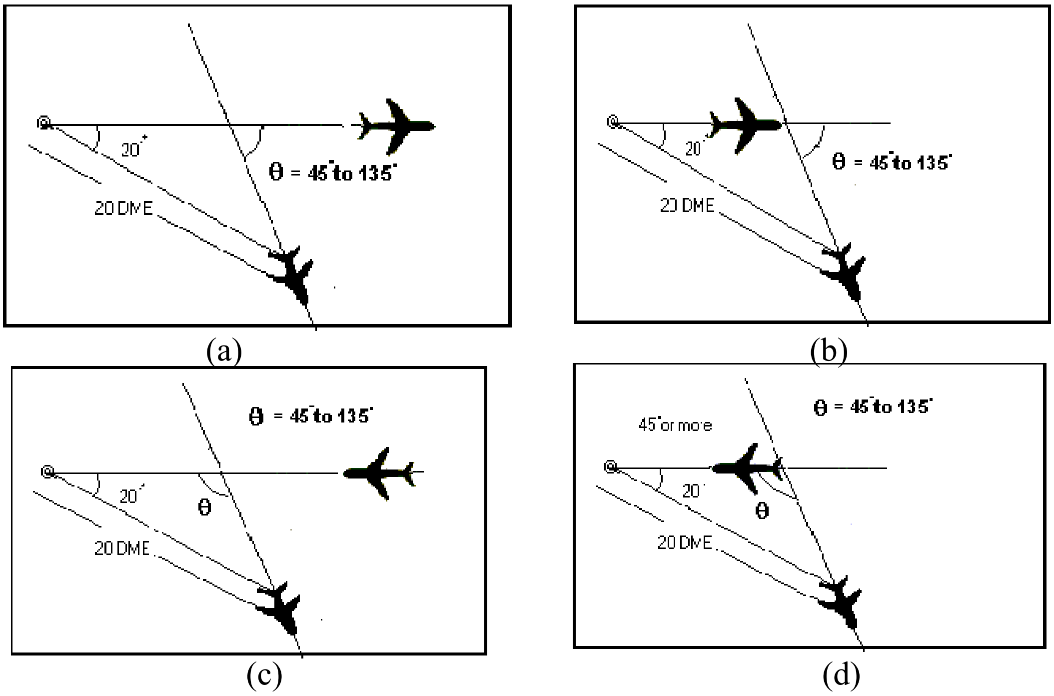


Figure 5-6: Separation by using Crossing Radial of same VOR (See 5.5.1.2.1.3)

5.5.1.2.1.4 *Lateral separation of aircraft on published ~~adjacent~~ instrument flight procedures for arrivals and departures:*

5.5.1.2.1.4.1 Lateral separation of departing and/or arriving aircraft, using instrument flight procedures, will exist:

a) where the distance between any combination of RNAV 1 with RNAV 1, or RNP 1, RNP APCH or RNP AR APCH tracks is not less than 7 NM; or

b) where the distance between any combination of RNP 1, RNP APCH or RNP AR APCH tracks is not less than 5 NM; or

c) where the protected areas of tracks designed using obstacle clearance criteria do not overlap and provided operational error is considered.

5.5.1.2.1.5 *RNAV operations where RNP is specified on parallel tracks or ATS routes:*

5.5.1.2.1.5.1 Within designated airspace or on designated routes, where RNP is specified, lateral separation between RNAV-equipped aircraft may be obtained by requiring aircraft to be established on the centre line of parallel tracks or ATS routes spaced at a distance which ensures that the protected airspace of the tracks or ATS routes do not overlap.

5.5.1.2.1.6 *Lateral separation of aircraft on parallel or non-intersecting tracks or ATS routes.*

5.5.1.2.1.6.1 Within designated airspace or on designated routes, lateral separation between aircraft operating on parallel or non-intersecting tracks or ATS routes shall be in accordance with Table 5-2 below:

Minimum spacing between tracks (NM)	**Prescribed Navigational Performance (RNP)**	**Other requirements**
50	RNAV 10 (RNP 10), RNP 4 or RNP 2	
23	RNP 4 or RNP 2	RCP 240, RSP 180. Conformance monitoring by establishing an ADS-C event contract with a lateral deviation change event with a maximum of 5 NM threshold and a waypoint change event
15	RNP 2 or a GNSS equipage*	Direct-controller-pilot VHF voice communication
While one aircraft climbs/descends through the level of another aircraft		
7	RNP 2 or a GNSS equipage*	Direct-controller-pilot VHF voice communication
20	RNP 2 or a GNSS equipage*	Using other than Direct-controller-pilot VHF voice communication

** - See PANS-ATM, DOC 4444, Appendix 2, ITEM 10: EQUIPMENT AND CAPABILITIES, in relation to the GNSS equipage.*

Table 5-2: Lateral separation of aircraft on parallel or non-intersecting tracks or ATS routes.

5.5.1.2.1.7 Lateral separation of aircraft on intersecting tracks or ATS routes.

5.5.1.2.1.7.1 Lateral separation between aircraft operating on intersecting tracks or ATS routes shall be established in accordance with the following:

a) an aircraft converging with the track of another aircraft is laterally separated until it reaches a lateral separation point that is located a specified distance measured perpendicularly from the track of the other aircraft (see Figure 5-7); and

b) an aircraft diverging from the track of another aircraft is laterally separated after passing a lateral separation point that is located a specified distance measured perpendicularly from the track of the other aircraft (see Figure 5-7).

This type of separation may be used for tracks that intersect at any angles using the values for lateral separation points specified in Table 5-3 below:

Navigation	*Separation*
RNAV 10 (RNP 10)	50 NM
RNP 4	23 NM
RNP 2	15 NM

Table 5-3: Lateral separation of aircraft on intersecting tracks or routes (See 5.5.1.2.1.7.1)

5.5.1.2.1.7.2 When applying the 15 NM separation minima specified in the table 5-3 above, a GNSS, as indicated in the flight plan by the letter G meets the specified navigation performance.

5.5.2 Longitudinal separation

5.5.2.1 For the purpose of application of longitudinal separation, the terms same track, reciprocal tracks and crossing tracks shall have the following meanings:

a) ***Same track*****:** same direction tracks and intersecting tracks or portions thereof, the angular difference of which is less than 45 degrees or more than 315 degrees, and whose protected airspaces overlap. (See Figure 5.8 (a))

b) ***Reciprocal tracks:*** Opposite tracks and intersecting tracks or portions thereof, the angular difference of which is more than 135 degrees but less than 225 degrees, and whose protected airspaces overlap. (See Figure 5.8 (b))

c) **Crossing Tracks:** Intersecting tracks or portions thereof other than those specified in a) and b) above. (See Figure 5.8 (c))

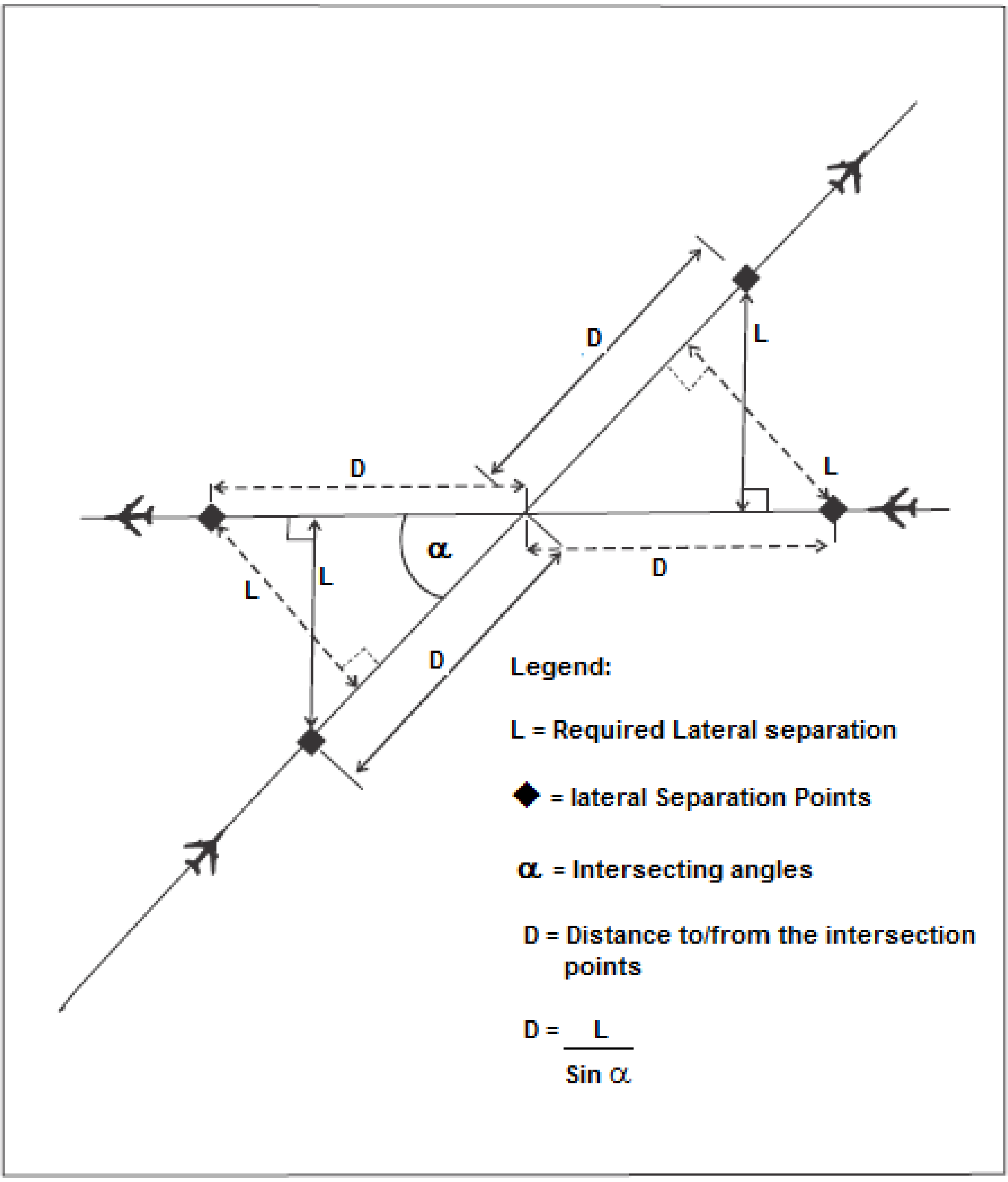


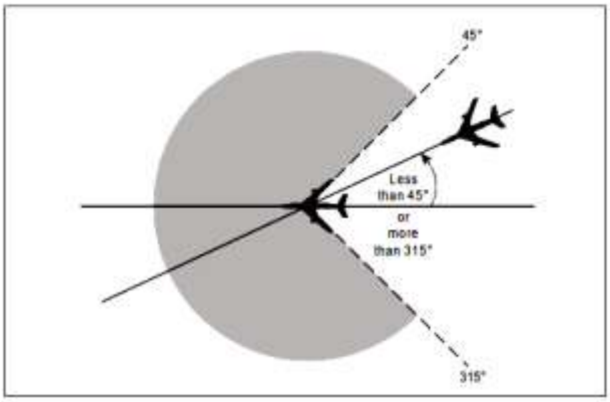
Figure 5-7: Lateral separation points (see *5.5.1.2.1.7)*

5.5.2.2 Longitudinal separation minima based on time:

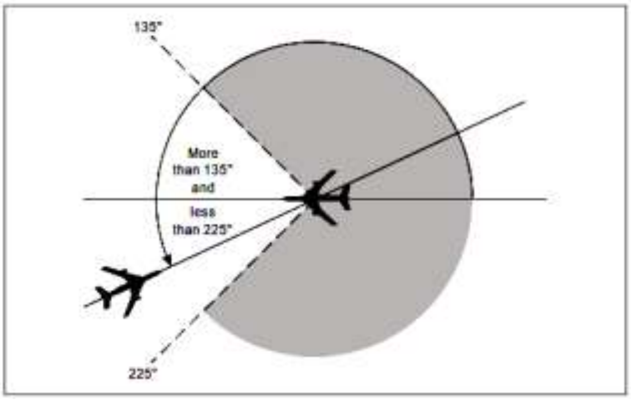
5.5.2.2.1 Cross Check Calculations

a) Separation requirements must be cross-checked to ensure the integrity of calculations.

b) The cross-check is to validate the initial calculation and to confirm that the calculation is consistent with the traffic disposition.



(a)



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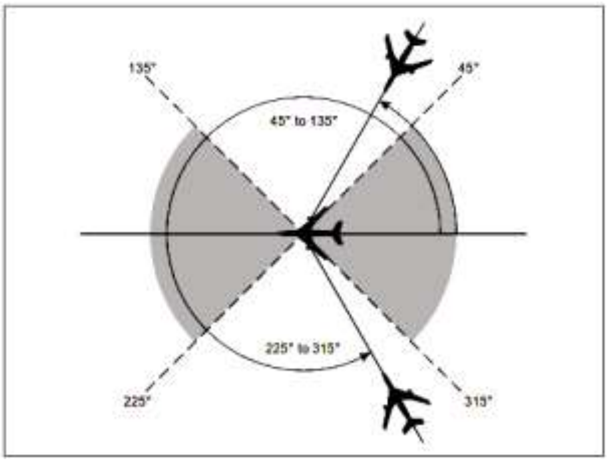


(c)

Figure 5-8: Aircraft on (a) Same Track, (b) Reciprocal Track and (c) Crossing track (See 5.5.2.1)

5.5.2.2.2 Aircraft at the same cruising level

5.5.2.2.2.1 *Aircraft flying on the same track*:

a) 15 minutes; (See Figure 5-9)

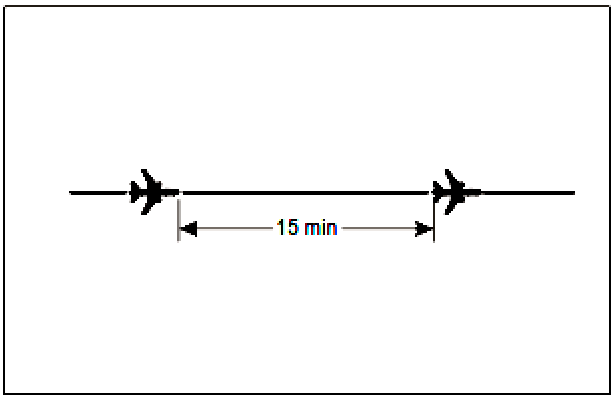


Figure 5-9: 15 minutes separation between aircraft on same track and same level

b) 10 minutes, if navigation aids permit frequent determination of position and speed; (See Figure 5-10)

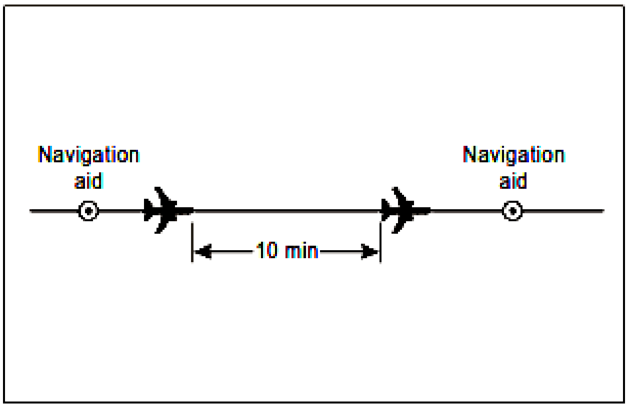


Figure 5-10: 10 minutes separation between aircraft on same track and same level

5.5.2.2.2.2 *Aircraft flying on crossing tracks:*

a) 15 minutes; (See figure 5-11)

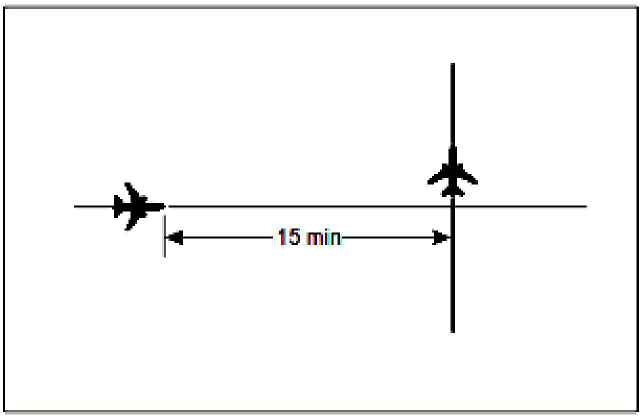


Figure 5-11: 15 minutes separation between aircraft on crossing track and same level

b) 10 minutes if navigation aids permit frequent determination of position and speed (See Figure 5-12)

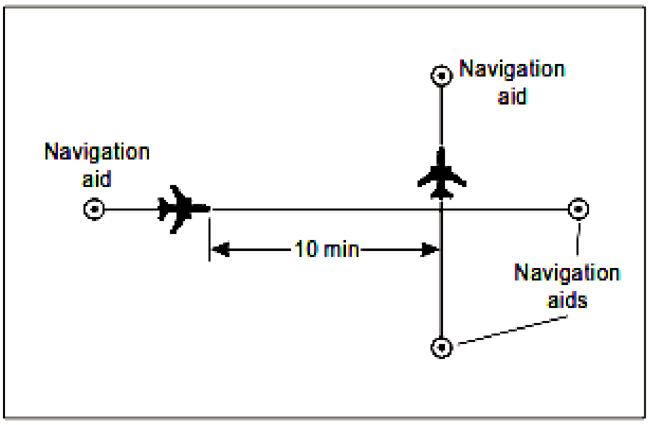
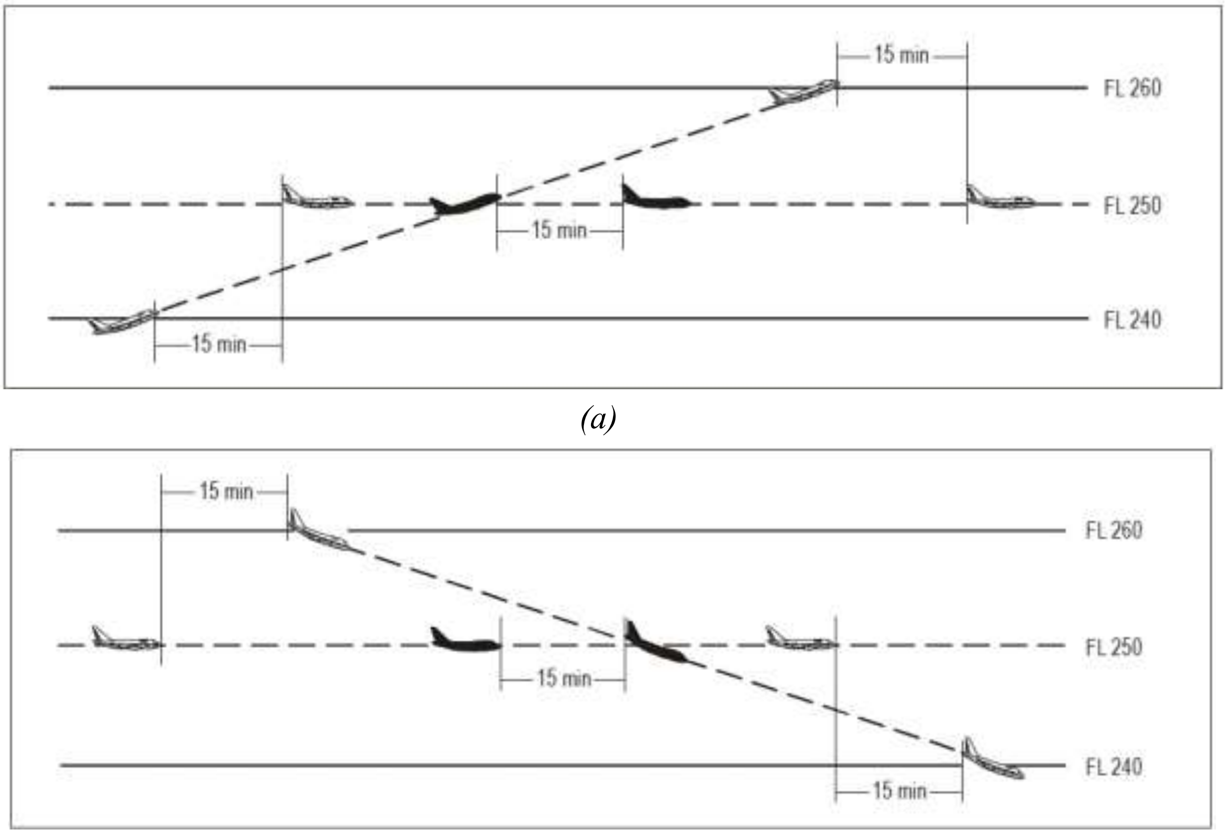


Figure 5-12: 10 minutes separation between aircraft on crossing track and same level

5.5.2.2.3 Aircraft climbing or descending

5.5.2.2.3.1 *Aircraft on the same track.* When an aircraft will pass through the level of another aircraft on the same track, the following minimum longitudinal separation shall be provided:

a) 15 minutes while vertical separation does not exist (See Figure 5-13-(a) and (b))



(a)

(b)

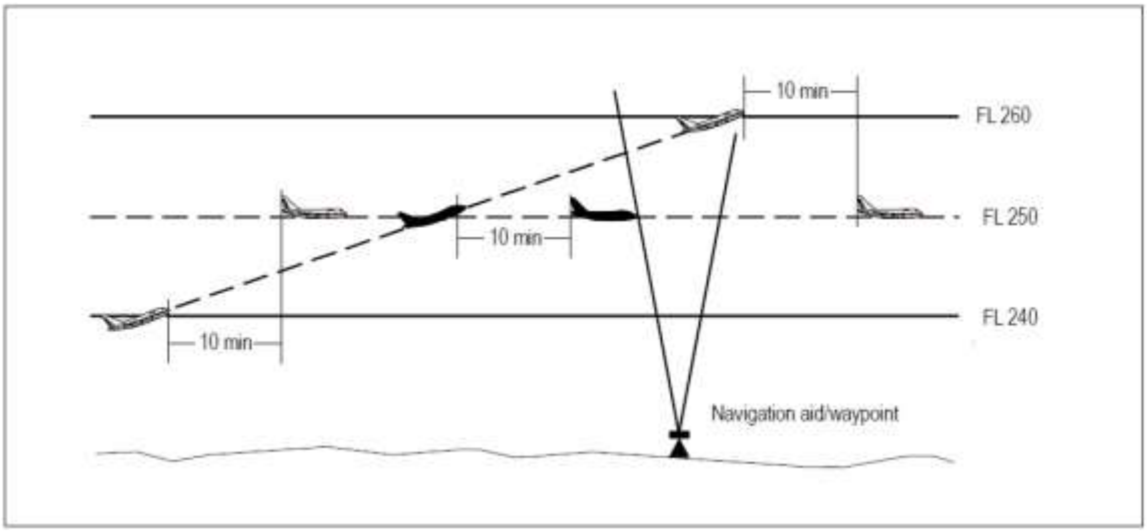
Figure 5-13: 15 minutes separation between aircraft (a) climbing, (b) descending; on same track {See 5.5.2.2.3.1 a)}

b) 10 minutes while vertical separation does not exist, provided that such separation is authorized only where navigation aids permit frequent determination of position and speed. (See Figure 5-14 (a) and (b)).

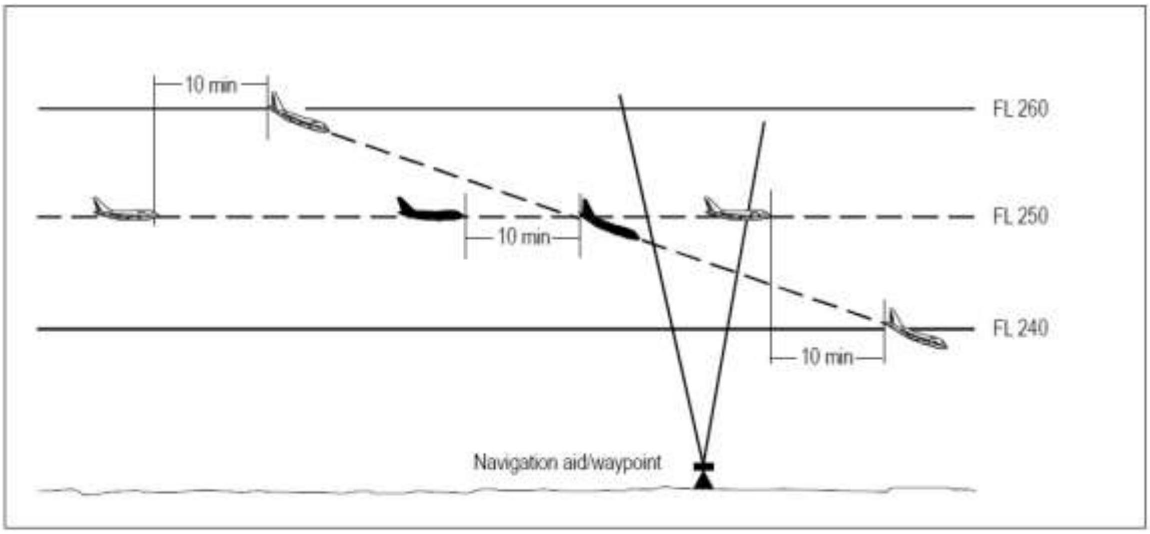
c) 5 minutes while vertical separation does not exist, provided that:

1) the level change is commenced within 10 minutes of the time the second aircraft has reported over a common point which must be derived from ground-based navigation aids or by GNSS; and (see Figure 5-15 (a) and (b))

2) when issuing the clearance through third party communication or CPDLC a restriction shall be added to the clearance to ensure that the 10 minute condition is satisfied.



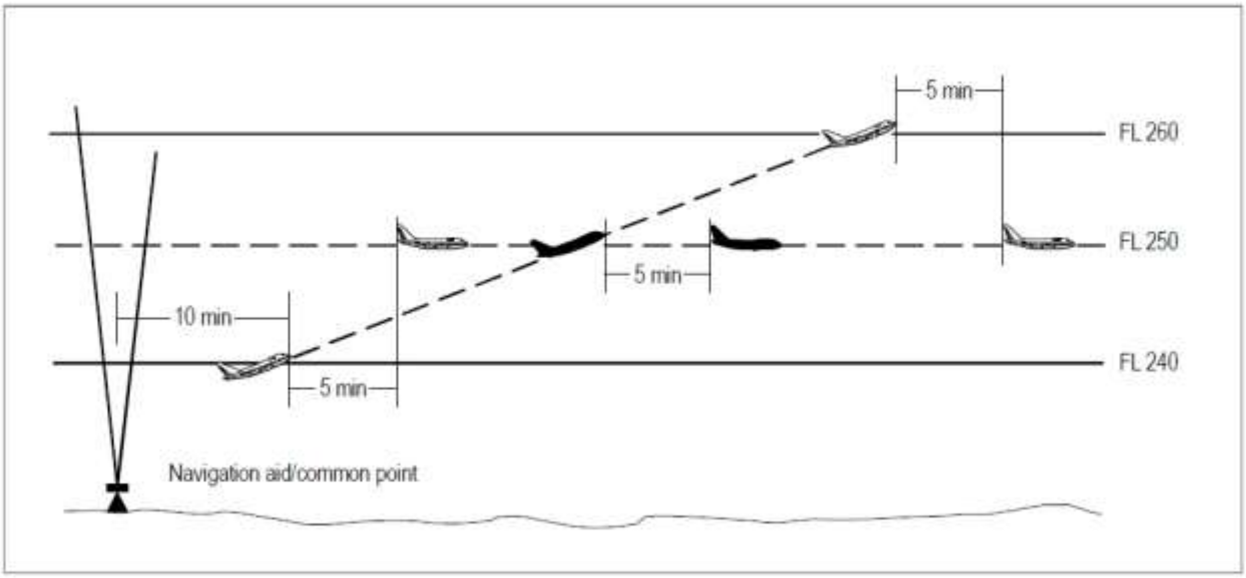
(a)



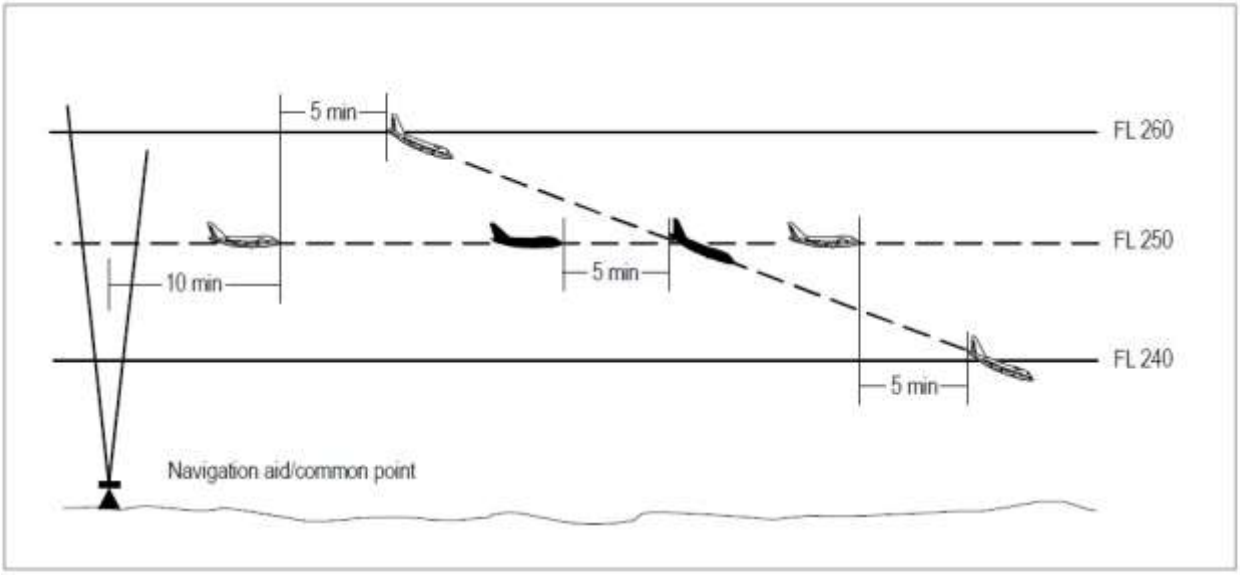
(b)

Figure 5-14: 10 minutes separation between aircraft (a) climbing, (b) descending and on same track {See 5.5.2.2.3.1 b)}.

Note.— To facilitate application of the procedure where a considerable change of level is involved, a descending aircraft may be cleared to some convenient level above the lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft, to permit a further check on the separation that will obtain while vertical separation does not exist.



(a)



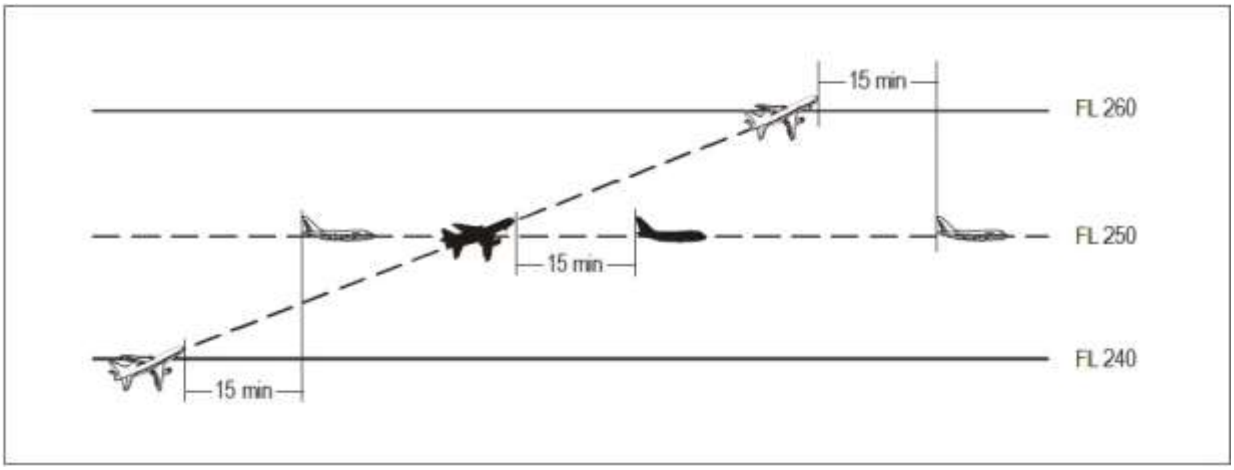
(b)

Figure 5-15: 5-minutes separation between aircraft (a) Climbing, (b) Descending and on same track {See 5.5.2.2.3.1 c)}

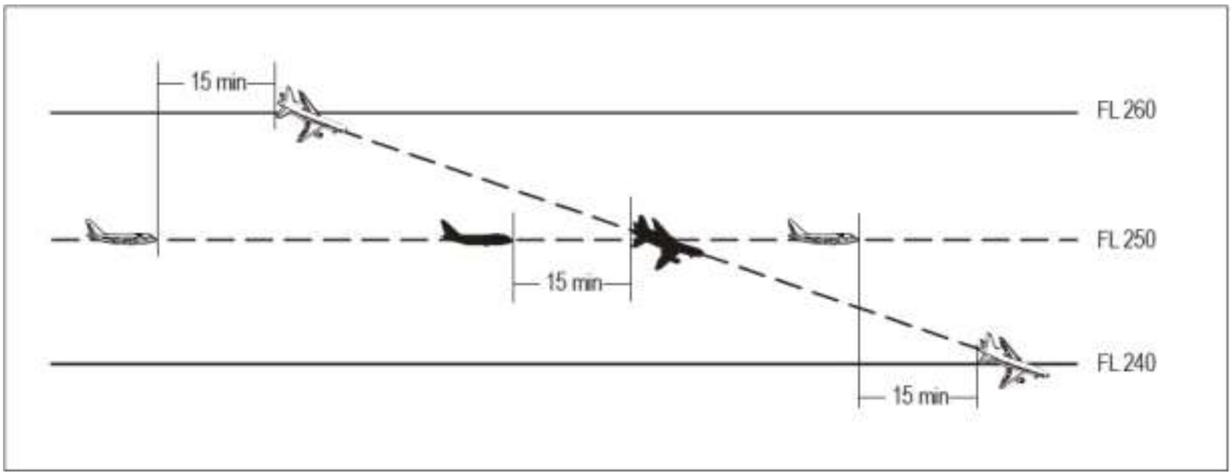
5.5.2.2.3.2 *Aircraft on crossing tracks:*

a) 15 minutes while vertical separation does not exist (See Figure 5-16 (a) and (b))

b) 10 minutes while vertical separation does not exist if navigation aids permit frequent determination of position and speed. (See Figure 5-17 (a) and (b))



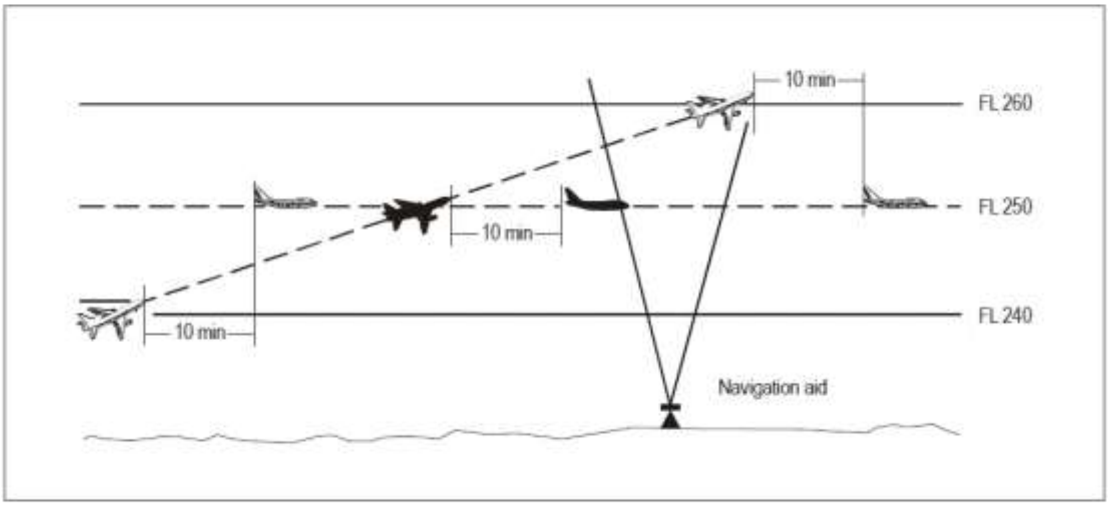
(a)



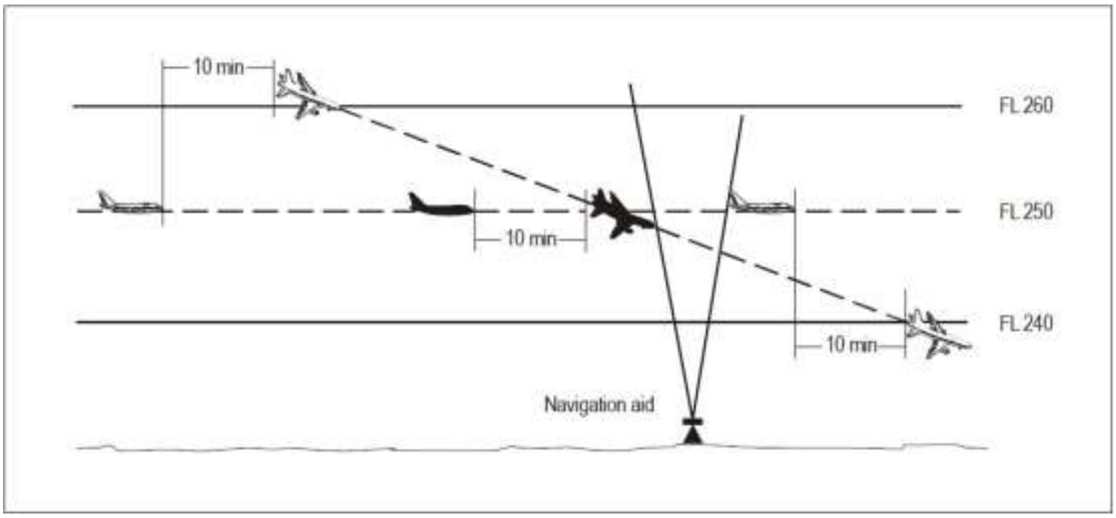
(b)

Figure 5-16: Fifteen-minutes separation between aircraft (a) Climbing, (b) Descending and on crossing Track {See 5.5.2.2.3.2 a)}.

5.5.2.2.3.3 *Aircraft on reciprocal tracks*: Where lateral separation is not provided, vertical separation shall be provided for at least ten minutes prior to and after the time the aircraft are estimated to pass, or are estimated to have passed. Provided that it has been determined that the aircraft have passed each other, this minimum need not apply. (See figure 5-18)



(a)



(b)

Figure 5-17: Ten minutes separation between aircraft (a) Climbing, (b) descending and on crossing tracks {See 5.5.2.2.3.2 b)}.

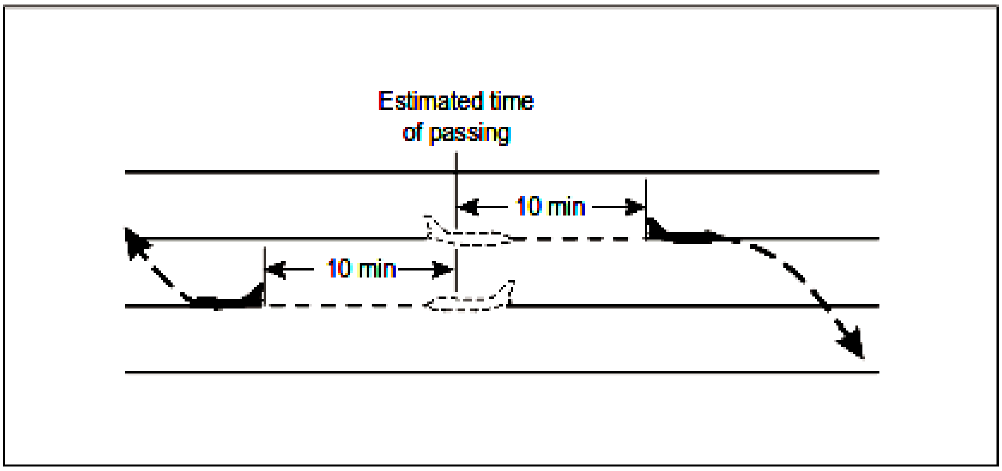


Figure 5-18: Ten Minutes separation between aircraft Climbing/Descending on reciprocal tracks {See 5.5.2.2.3.3}.

5.5.2.3 Longitudinal separation minima based on distance using Distance Measuring Equipment (DME) and/or GNSS

Note.— Where the term "on track" is used in the provisions relating to the application of longitudinal separation minima using DME and/or GNSS, it means that the aircraft is flying either directly inbound to or directly outbound from the station/waypoint.

5.5.2.3.1 Separation shall be established by maintaining not less than specified distance(s) between aircraft positions as reported by reference to DME in conjunction with other appropriate navigation aids and/or GNSS. This type of separation shall be applied between two aircraft using DME, or two aircraft using GNSS, or one aircraft using DME and one aircraft using GNSS. Direct controller-pilot VHF voice communication shall be maintained while such separation is used.

Note.- For the purpose of applying GNSS based separation minimum, a distance derived from an integrated navigation system incorporating GNSS input is regarded as equivalent to GNSS distance.

5.5.2.3.2 All distance reports must be made with reference to the same DME station and/or collocated waypoint and /or same waypoint.

5.5.2.3.3 When applying these separation minima between any aircraft with area navigation capability, controllers shall specifically request GNSS derived distance.

Note.- Reason making a pilot unable to provide GNSS distance information may include inadequate onboard equipment, on GNSS input into an integrated navigation system, or a loss of GNSS integrity.

5.5.2.3.4 Aircraft at the same cruising level

5.5.2.3.4.1 Aircraft on the same track:

a) 20 NM, provided:

1) each aircraft utilizes,

i) the same "on track" DME station when both aircraft are utilizing DME, or

ii) an "on track" DME station and a collocated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS, or

iii) the same waypoint when both aircraft are utilizing GNSS, and

2) separation is checked by obtaining simultaneous DME and/or GNSS readings from the aircraft at frequent intervals to ensure that the minimum will not be infringed. (See Figure 5-19)

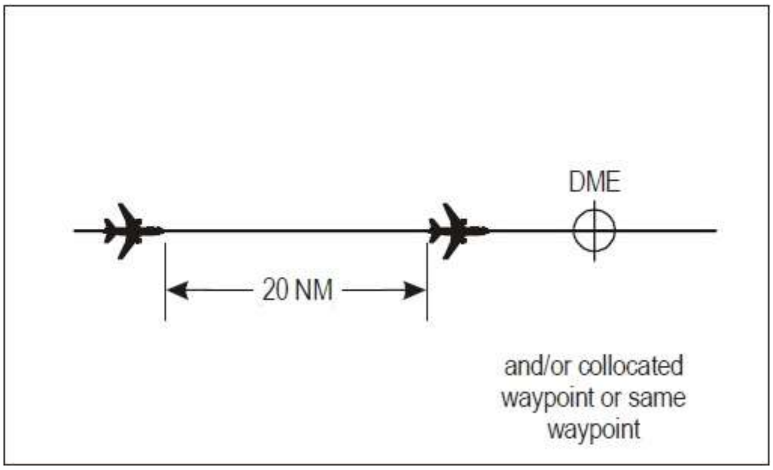


Figure 5-19: 20 NM DME and/or GNSS-based separation between aircraft on same track same level {See *5.5.2.3.4.1 a)}*

b) 10 NM, provided:

1) the leading aircraft maintains a true airspeed of 20 kt or more faster than the succeeding aircraft;

2) each aircraft utilizes,

i) the same "on track" DME station when both aircraft are utilizing DME, or

ii) an "on track" DME station and a collocated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS, or

iii) the same waypoint when both aircraft are utilizing GNSS, and

3) separation is checked by obtaining simultaneous DME and/or GNSS readings from the aircraft at frequent intervals to ensure that the minimum will not be infringed. (See figure 5-20)

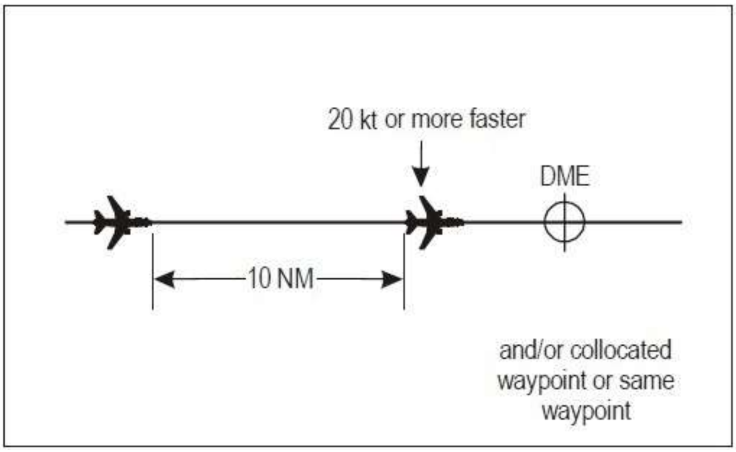


Figure 5-20: 10 NM DME and/or GNSS-based separation between aircraft on same track same level {See *5.5.2.3.4.1 b)}*

5.5.2.3.4.2 *Aircraft on crossing tracks:*

The longitudinal separation prescribed in 5.5.2.3.4.1 shall also apply provided each aircraft reports distance from the DME station and/or collocated waypoint or same waypoint located at the crossing point of the tracks and that the relative angle between the tracks is less than 90 degrees (see Figures 5-21 and 5-22).

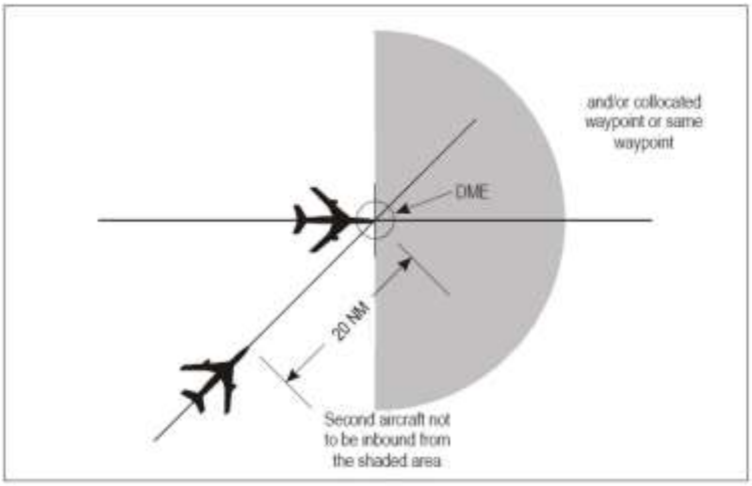


Figure 5-21: 20 NM DME and/or GNSS-based separation between aircraft on crossing track and same level {See *5.5.2.3.4.2}*

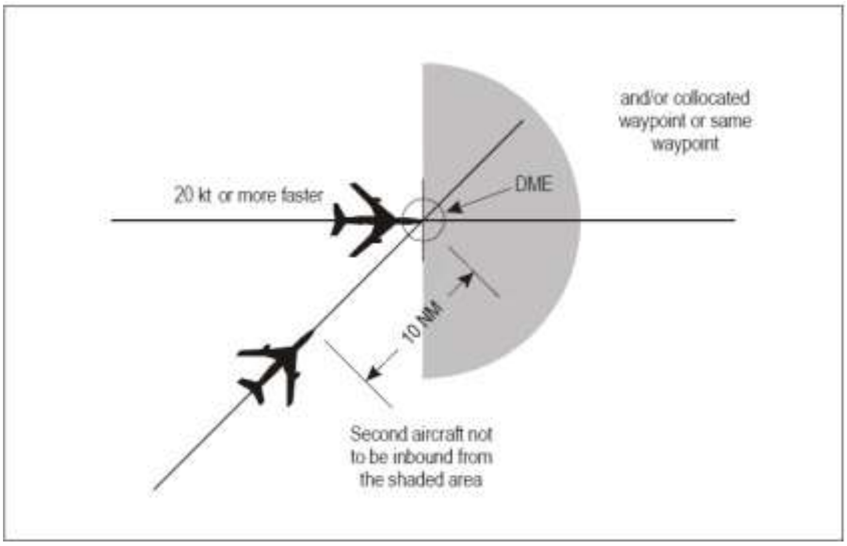


Figure 5-22: 10 NM DME and/or GNSS-based separation between aircraft on crossing track and same level {See *5.5.2.3.4.2}*

5.5.2.3.5 **Aircraft climbing or descending**

5.5.2.3.5.1 *Aircraft on the same track*: 10 NM while vertical separation does not exist, provided:

a) each aircraft utilizes,

i) the same "on track" DME station when both aircraft are utilizing DME, or

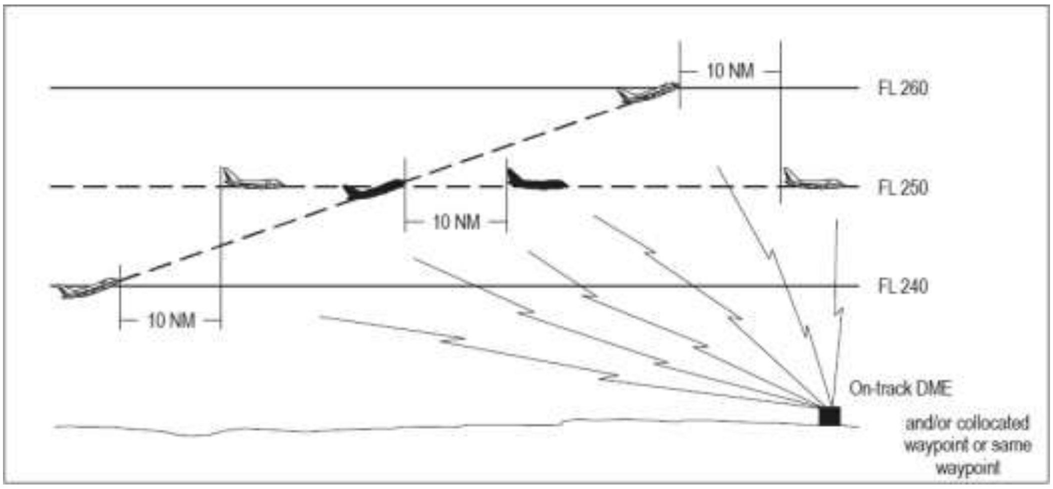
ii) an "on track" DME station and a collocated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS, or

iii) the same waypoint when both aircraft are utilizing GNSS, and

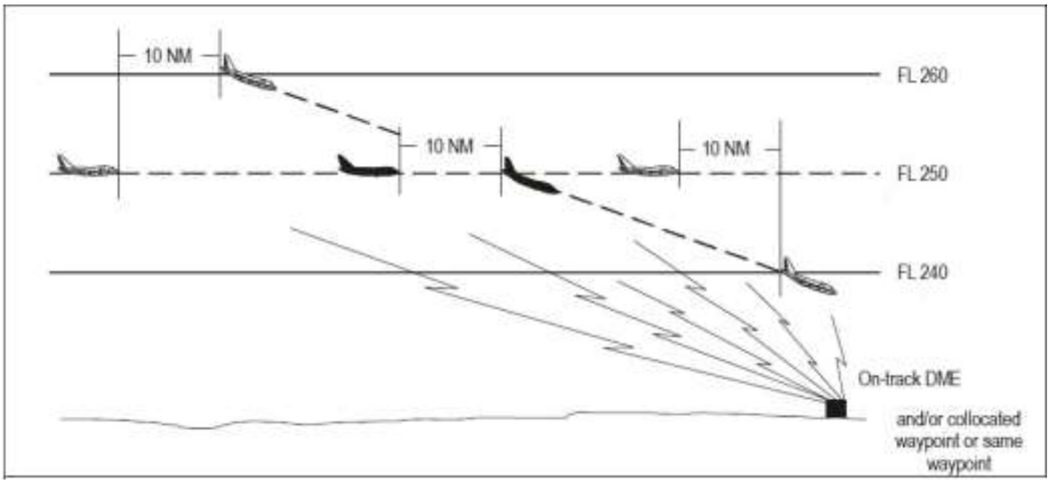
b) one aircraft maintains a level while vertical separation does not exist; and

c) separation is established by obtaining simultaneous DME and/or GNSS readings from the aircraft. (See figures 5-23 (a) and (b))

Note.— To facilitate application of the procedure where a considerable change of level is involved, a descending aircraft may be cleared to some convenient level above the lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft, to permit a further check on the separation that will obtain while vertical separation does not exist



(a)



(b)

Figure 5-23: 10 NM DME and/or GNSS-based separation between aircraft (a) climbing, (b) descending and on same track {See *5.5.2.3.5.1}*

5.5.2.3.5.2 <u>Aircraft on reciprocal tracks</u>: Aircraft utilizing on-track DME and/or collocated waypoint or same waypoint may be cleared to climb or descend to or through the levels occupied by other aircraft utilizing on-track DME and/or collocated waypoint or same waypoint, provided that it has been positively established that the aircraft have passed each other and are at least 10 NM apart.

5.5.2.4 **Longitudinal separation minima with Mach number technique based on time:**

5.5.2.4.1 The following conditions shall be met when the Mach number technique is being applied:

a) **Aircraft Types**: Turbojet aircraft only.

b) **Routes:**

i) The aircraft concerned have reported over the same common point and follow the same track or continuously diverging tracks until some other form of separation is provided; or

ii) If the aircraft have not reported over the same reporting point and it is possible to ensure, by radar, ADS-B or other means, that the appropriate time interval will exist at the common point from which they either follow the same track or continuously diverging tracks.

c) **Levels:** The aircraft concerned are on the same track in level flight, climbing or descending.

Note1. The Mach Number Technique is applied using True Mach Number

d) **Mach Number Assignment:** A Mach number (or, when appropriate, a range of Mach numbers) shall be issued to each aircraft.

Note1: *Turbojet aircraft shall adhere to the Mach number approved by ATC and shall request ATC approval before making any changes thereto. If it is essential to make an immediate temporary change in the Mach number (e.g. due to turbulence), ATC shall be notified as soon as possible that such a change has been made.*

Note2*: If it is not feasible, due to aircraft performance, to maintain the last assigned Mach number during en-route climbs and descents, pilots of aircraft concerned shall advise ATC at the time of the climb/descent request.*

e) **Separation Minima**

i) When Mach number technique is applied, minimum longitudinal separation between turbojet aircraft on the same track, whether in level, climbing or descending flight shall be 10 minutes.

ii) The applicable longitudinal separation minima is maintained by:

- Ensuring that the spacing between the estimated positions of the aircraft is not less than the prescribed minimum.
- Continuously monitoring aircraft position reports and updating control estimates along the aircraft's track(s). If after establishing the Mach number technique between aircraft, control information indicates that less than the applicable minima between aircraft may exist, immediately
  - ⇨ Issue crossing restrictions to ensure the appropriate longitudinal minima at the next significant point, or
  - ⇨ Assign revised Mach numbers appropriate for the estimated interval, or
  - ⇨ Establish vertical separation.

NOTE-Control estimates are calculated by the controller using known wind patterns, previous aircraft transit times, pilot progress reports, and pilot estimates.

f) **Relative Speeds**

The preceding aircraft shall maintain a true Mach number equal to or greater than that maintained by the following aircraft.

When preceding aircraft is maintaining a true Mach number greater than the following aircraft separation minima of 9 and 5 minutes inclusive, on prescribed minima may be applied in accordance with table 5-4:

Application of the Mach Number Technique when the Preceding Aircraft is Faster	
Separation Minima in Minutes	**Mach Number by which the Preceding Aircraft is Faster**
09	0.02
08	0.03
07	0.04
06	0.05
05	0.06

Table 5-4 Application of the Mach Number Technique when the preceding aircraft is faster

Note: Application of differential Mach Number shall be applied only when LOA between two ATC Centre permit.

5.5.2.5 Longitudinal separation minima based on distance using RNAV where RNP is specified

5.5.2.5.1 Separation shall be established by maintaining not less than the specified distance between aircraft positions as reported by reference to the same "on-track" common point, whenever possible ahead of both aircraft, or by means of an automated position reporting system.

Note.— *The term "on track" means that the aircraft is flying either directly inbound to or directly outbound from the station or waypoint.*

5.5.2.5.1.1 When information is received indicating navigation equipment failure or deterioration below the navigation performance requirements, ATC shall then, as required, apply alternative separation minima.

5.5.2.5.1.2 Direct controller-pilot communications shall be maintained while applying a distance-based separation minima. Direct controller-pilot communications shall be voice or CPDLC.

5.5.2.5.1.3 When aircraft are at, or are expected to reduce to, the minimum separation applicable, speed control techniques, including assigning Mach number, shall be applied to ensure that the minimum distance exists throughout the period of application of the minima.

5.5.2.5.2 Longitudinal distance-based separation minima in an RNP RNAV environment not using ADS-C

5.5.2.5.2.1 For aircraft cruising, climbing or descending on the same track, the separation minimum in Table 5-5 may be used:

Separation Minimum	RNP type	Communication requirement	Surveillance requirement	Distance verification requirements
50 NM	10	Direct Controller-Pilot Communications	Procedural position reports	At least every 24 minutes

Table 5-5: Longitudinal Separation minima in an RNP/RNAV environment not using ADS-C; for aircraft cruising, climbing or descending on the same track

Note 1.— *Where a considerable change of level is involved using distance-based separation, a descending aircraft may be cleared to some convenient level above the* *lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft (e.g. (4 000 ft or less) to permit a further check on the separation that will be maintained while vertical separation does not exist.*

5.5.2.5.2.2 During the application of the 50 NM separation, when an aircraft fails to report its position, the controller shall take action within 3 minutes to establish communication. If communication has not been established within 8 minutes of the time the report should have been received, the controller shall take action to apply an alternative form of separation.

5.5.2.5.2.3 *Aircraft on reciprocal tracks*. Aircraft may be cleared to climb or descend to or through the levels occupied by the other provided that it has been positively established that the aircraft have passed each other and the distance between them is equal to at least the applicable separation minimum.

5.6 Separation of aircraft holding in flight

5.6.1 Except when lateral separation as specified in MATS-Part 2, exists; aircraft established in adjacent holding patterns shall be separated by the applicable vertical separation minimum.

5.6.2 Except when lateral separation exists, vertical separation shall be applied between aircraft holding in flight and other aircraft, whether arriving, departing or en route, whenever the other aircraft concerned are within five minutes flying time of the holding area. (See Figure 5-24)

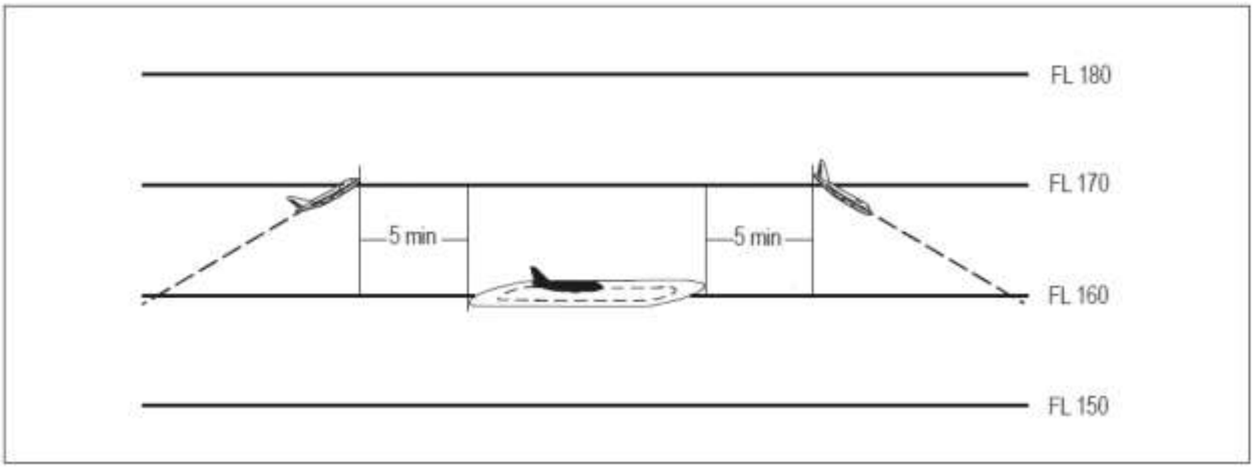


Figure 5-24: Separation between holding aircraft and en-route aircraft.

5.7 Minimum separation between departing aircraft

5.7.1 One-minute separation if aircraft are to fly on tracks diverging by at least 45 degrees immediately after take-off so that lateral separation is provided. (See Figure 5-25)

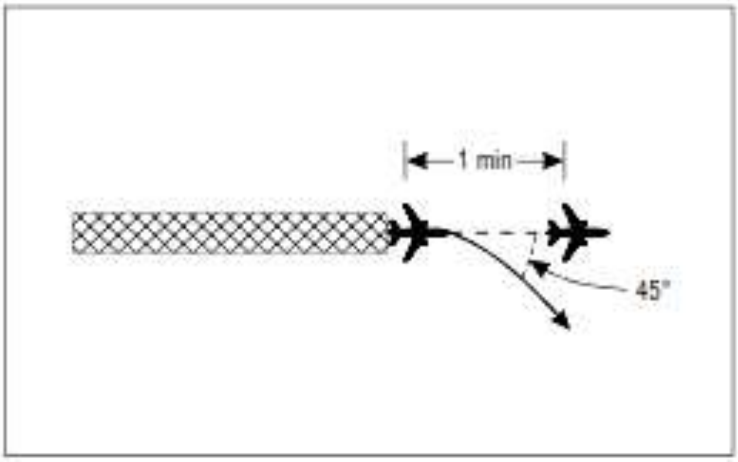


Figure 5-25: One-minute separation between departing aircraft following tracks diverging by at least 45 degrees (See 5.7.1).

Note 1.— Wake turbulence categorization of aircraft and longitudinal separation minima are contained in Para 5.9

5.7.2 Two minutes between take-offs when the preceding aircraft is 40 kt or more faster than the following aircraft and both aircraft propose to follow the same track. (See figure 5-26).

***Note**: Calculations, based on TAS, of speed differentials of aircraft during climb may not be sufficiently accurate in all circumstances for determining if the procedures in 5.7.2 can be applied, in which case calculations based on IAS may be more suitable.*

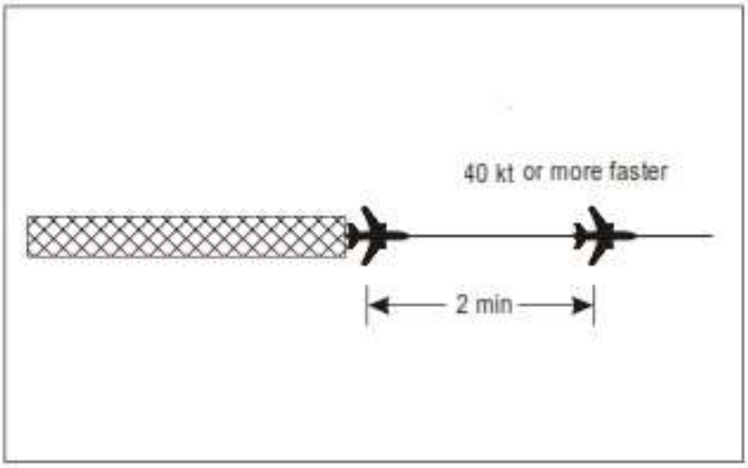


Figure 5-26: Two minute separation between aircraft following same track (See 5.7.2).

5.7.3 Five-minute separation while vertical separation does not exist if a departing aircraft will be flown through the level of a preceding departing aircraft and both aircraft propose to follow the same track. Action must be taken to ensure that the five-minute separation will be maintained or increased while vertical separation does not exist. (See figure 5-27).

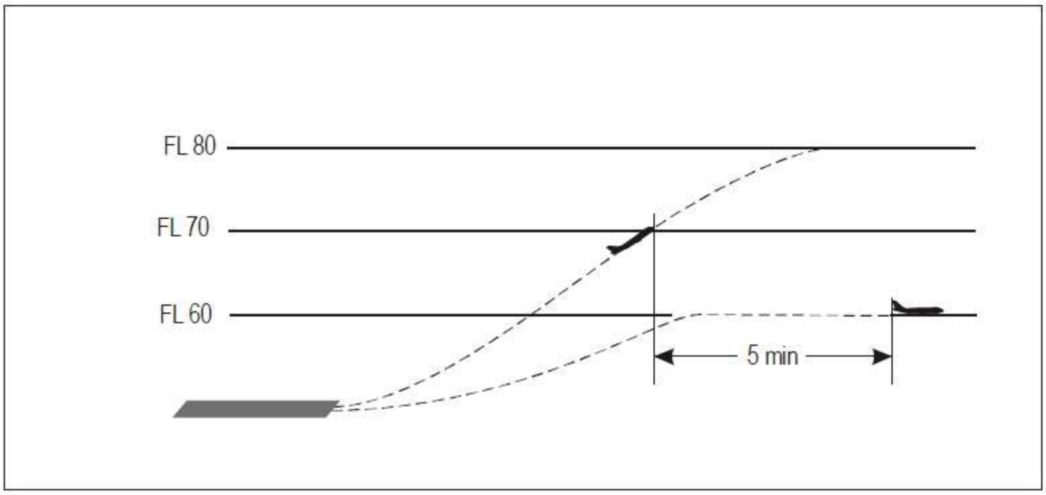


Figure 5-27: Five-minutes separation of departing aircraft following same track (see 5.7.3)

5.8 Separation of departing aircraft from arriving aircraft

5.8.1 The following separation shall be applied when take-off clearance is based on the position of an arriving aircraft:

5.8.1.1 If an arriving aircraft is making a complete instrument approach, a departing aircraft may take off:

a) in any direction until an arriving aircraft has started its procedure turn or base turn leading to final approach;

b) in a direction which is different by at least 45 degrees from the reciprocal of the direction of approach after the arriving aircraft has started procedure turn or base turn leading to final approach, provided that the take-off will be made at least three minutes before the arriving aircraft is estimated to be over the beginning of the instrument runway. (See figure 5-28).

5.8.1.2 If an arriving aircraft is making a straight-in approach, a departing aircraft may take off:

a) in any direction until five minutes before the arriving aircraft is estimated to be over the instrument runway;

b) in a direction which is different by at least 45 degrees from the reciprocal of the direction of approach of the arriving aircraft:

i) until three minutes before the arriving aircraft is estimated to be over the beginning of the instrument runway, (See figure 5-28) or

ii) before the arriving aircraft crosses a designated fix on the approach track; the location of such fix to be determined after consultation with the operators and published in MATS-Part 2.

***Note**: Lateral separation is considered to exist between an arriving aircraft that subsequently commenced final approach and the departing aircraft that has established on a course diverging by at least 45 degrees from the reciprocal of the final approach course.*

Note: Use of runway other than runway- in- use for the purpose of application of separation vide para 5.8.1.1.a) and 5.8.1.2.b) is not authorized.

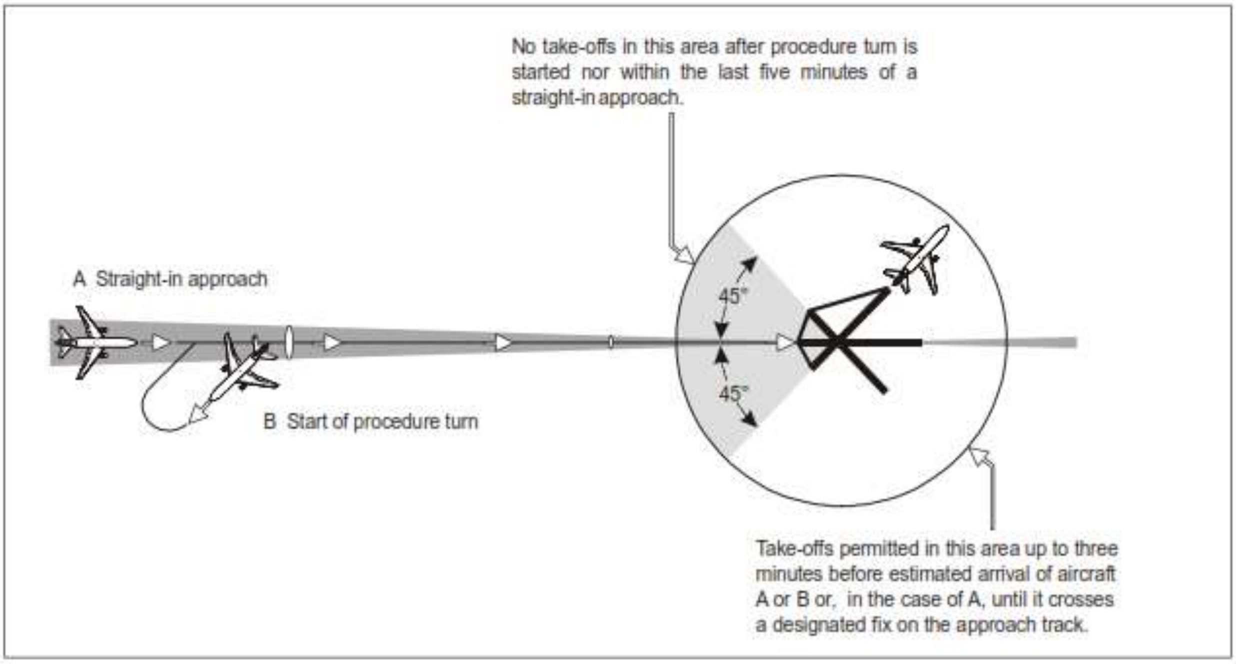


Figure 5-28: Separation of departing aircraft from arriving aircraft.

5.8.2 Departing aircraft is maintaining a radial from a VOR and arriving aircraft established on a collocated DME arc:

i) **Case 1**: An arriving aircraft carrying out a DME arc procedure, and a departing aircraft, established on a track which is different by at least 45 degrees from the reciprocal of the direction of final approach track of the arriving aircraft, will be deemed to be laterally separated, when

a) the arriving aircraft is established on a DME arc of at least 10 NM using same VOR and is moving away from the track of the departing aircraft maintaining VOR radial; and

b) the departing aircraft maintaining the VOR radial is crossing the arc of the arriving aircraft from behind; and

c) the arriving aircraft has passed a VOR radial which is different by at least 30 degrees from the radial maintained by departing aircraft. (See figure 5-29)

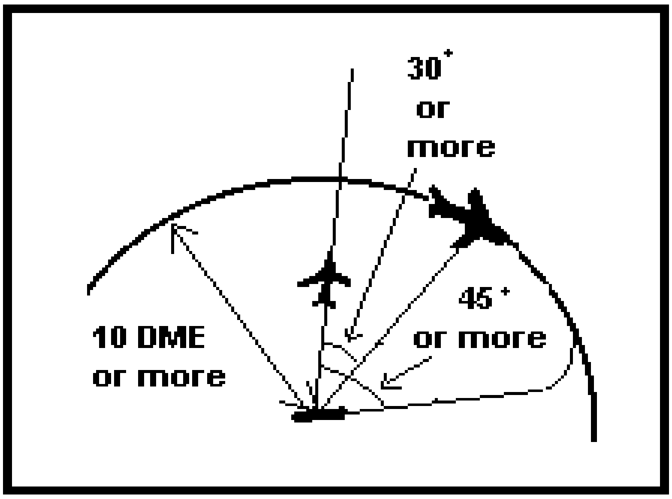
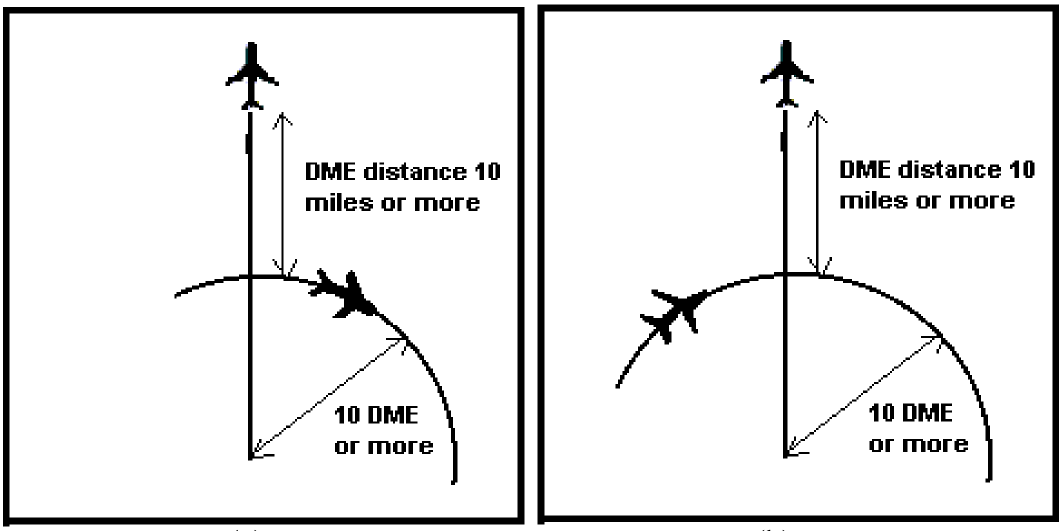


Figure 5-29: Separation between departing and arriving aircraft-- Arriving aircraft established on a 10 DME arc and departing aircraft crossing the arc from behind.

ii) **Case 2**: When a departing aircraft is maintaining a radial from a VOR and arriving aircraft established on a DME arc of at least 10 NM using same VOR, will be deemed to be laterally separated, when the aircraft established on VOR radial is at a DME distance of 10 miles or greater than the DME arc maintained by the arriving aircraft. (See figure 5-30 a) and b).



(a) (b)

Figure 5-30: Separation between departing and arriving aircraft-- Arriving aircraft established on a 10 DME arc and departing aircraft is at least 10 NM DME away from the arc.

5.9 Time-based wake turbulence longitudinal separation minima

5.9.1 Categorization of aircraft: Wake turbulence separation minima should be based on a grouping of aircraft types into three categories according to the maximum certificated take-off mass.

Category	Maximum Certified take off mass
Heavy	1,36,000 kg or more
Medium	Less than 1.36,000 kg but more than 7000 kg
Light	7000 kg or less

Table 5-6: Wake Turbulence Categories

Note:1 Vortices generated by the Airbus A380-800 are more substantial than for other aircraft in the "Heavy" wake turbulence category which necessitates an increase in minima in relation to the wake turbulence separation minima. Accordingly, wake turbulence separation minima procedures applicable to A380-800 should be applied as included.

Note: 2 For the Airbus A380-800, with a maximum certificated take-off mass in the order of 5,60.000 Kg, the word "Super" should be included immediately after the aircraft call sign in the initial radiotelephony contact between such aircraft and ATS units.

5.9.2 For aircraft in the heavy wake turbulence category the word "Heavy" shall be included immediately after the aircraft call sign in the initial radiotelephony contact between such aircraft and ATS units. The ATC unit concerned shall not be required to apply wake turbulence separation:

a) for arriving VFR flights landing on the same runway as a preceding landing HEAVY or MEDIUM aircraft; and

b) between arriving IFR flights executing visual approach when the aircraft has reported the preceding aircraft in sight and has been instructed to follow and maintain own separation from that aircraft.

5.9.3 The ATC unit shall, in respect of the flights specified in 5.9.2 a) and b) as well as when otherwise deemed necessary, issue a caution of possible wake turbulence.

5.9.4 Arriving aircraft

5.9.4.1 Except as provided in 5.9.2 a) and b), a minimum separation as given in Table 5-7 shall be applied to aircraft landing behind a HEAVY or a MEDIUM aircraft:

S. No.	Leading Aircraft	Following Aircraft	Separation Minima
1	A380-800	MEDIUM	3 Minutes
2	A380-800	LIGHT	4 Minutes
3	HEAVY	MEDIUM	2 Minutes
4	HEAVY or MEDIUM	LIGHT	3 Minutes

Table 5-7 Wake turbulence separation Minima in case of arriving aircraft

5.9.5 Departing aircraft

5.9.5.1 A minimum separation as given in Table 5-8 shall be applied when the aircraft are using:

a) the same runway;

b) parallel runways separated by less than 760 m (2500 ft); (See Figure 5-31)

c) crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1000 ft below; (See Figure 5-32)

d) parallel runways separated by 760 m (2500 ft) or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1000 ft below.

S. no.	Leading Aircraft	Following Aircraft	Separation Minima
1	A 380-800	Non-A 380-800 HEAVY	2 Minutes
2	A 380-800	MEDIUM or LIGHT	3 Minutes
3	HEAVY	LIGHT or MEDIUM	2 Minutes
4	MEDIUM	LIGHT	2 Minutes

Table 5-8 Wake turbulence separation Minima in case of departing aircraft

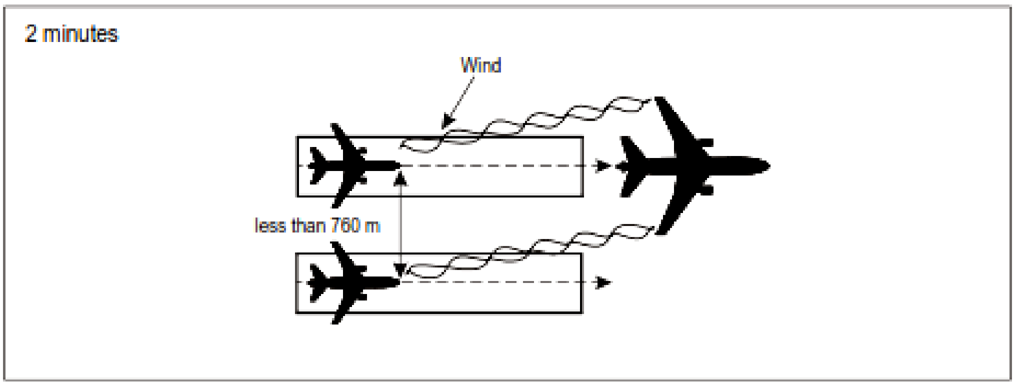


Figure 5-31: Two minute Wake turbulence separation for following aircraft on parallel runway.

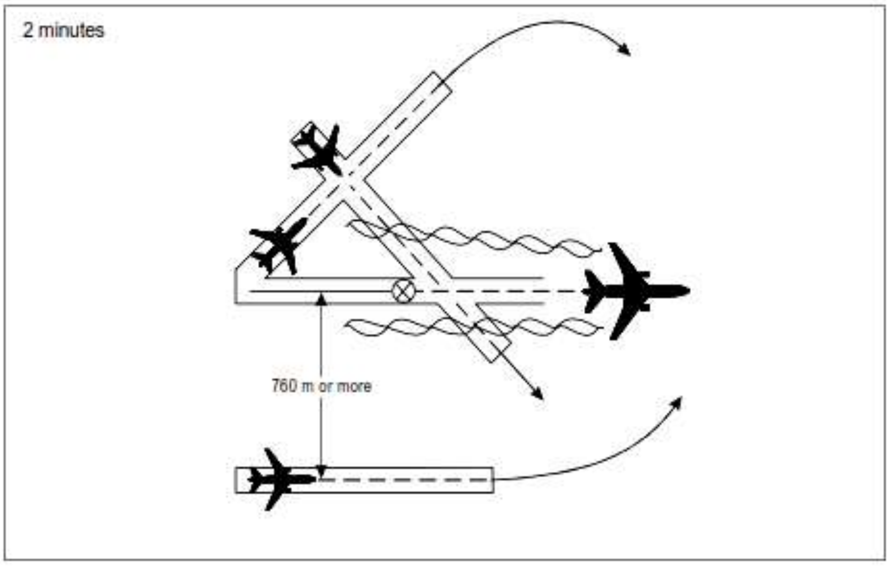


Figure 5-32: Two-minute wake turbulence separation for aircraft operating from crossing runway.

5.9.5.2 A minimum separation as given in Table 5-9 shall be applied when the aircraft are departing from:

a) an intermediate part of the same runway; or

b) an intermediate part of a parallel runway separated by less than 760 m (2500 ft). (See Figure5-33)

S.no.	Leading Aircraft	Following Aircraft	Separation Minima
1	A380-800	MEDIUM or LIGHT	4 Minutes
2	HEAVY	MEDIUM or LIGHT	3 Minutes
3	MEDIUM	LIGHT	3 Minutes

Table 5-9: Wake turbulence separation minima from intermediate part of runway

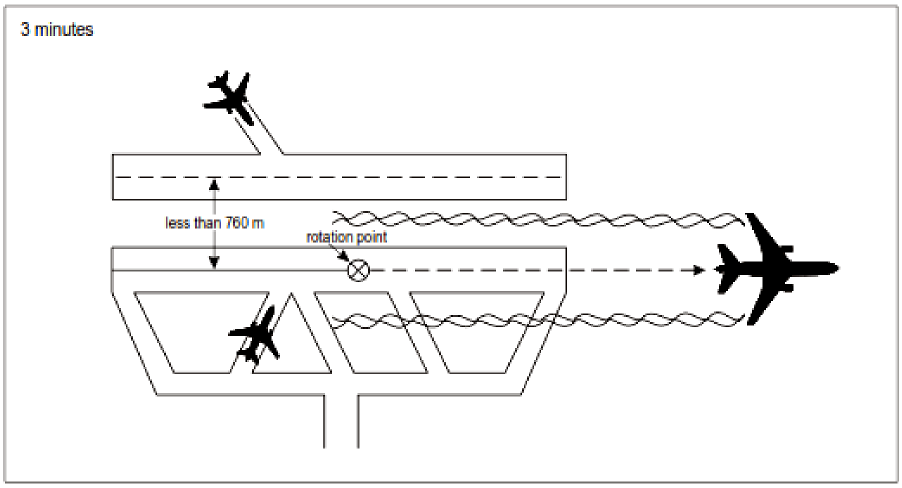


Figure 5-33: Three-minutes wake turbulence separation minima for aircraft operating from intermediate part of runway.

5.9.6 Displaced landing threshold:

5.9.6.1 A separation minimum as specified in Table 5-10 shall be applied between aircraft operating on a runway with a displaced landing threshold:

S. no.	Leading Aircraft	Following Aircraft	Separation Minima
1	A380-800 Arrival	LIGHT or MEDIUM	3 Minutes
2	A380-800 Departure	LIGHT or MEDIUM	3 Minutes
3	HEAVY Arrival	LIGHT or MEDIUM Departure	2 Minutes
4	MEDIUM Arrival	LIGHT Departure	2 Minutes
5	HEAVY Departure	LIGHT or MEDIUM Arrival	2 Minutes
6	MEDIUM Departure	LIGHT Arrival	2 Minutes

Table 5-10: Wake Turbulence separation minima in case of operation from displaced threshold.

5.9.7 Opposite Direction

5.9.7.1 A separation minimum of 2 minutes shall be applied between a LIGHT or MEDIUM aircraft and a HEAVY aircraft and between a LIGHT aircraft and a MEDIUM aircraft when the heavier aircraft is making a low or missed approach and the lighter aircraft is:

a) utilizing an opposite-direction runway for take-off; (See Figure 5-~~40~~34) or

b) landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760 m (2500 ft). (See figure5-~~41~~35)

5.9.7.2 A separation minimum of 3 minutes should be applied between a LIGHT or MEDIUM aircraft and an A380-800 aircraft when the A380-800 aircraft is making a low or missed approach and the LIGHT or MEDIUM aircraft is:

i. utilizing an opposite-direction runway for take-off; or

ii. landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760 m.

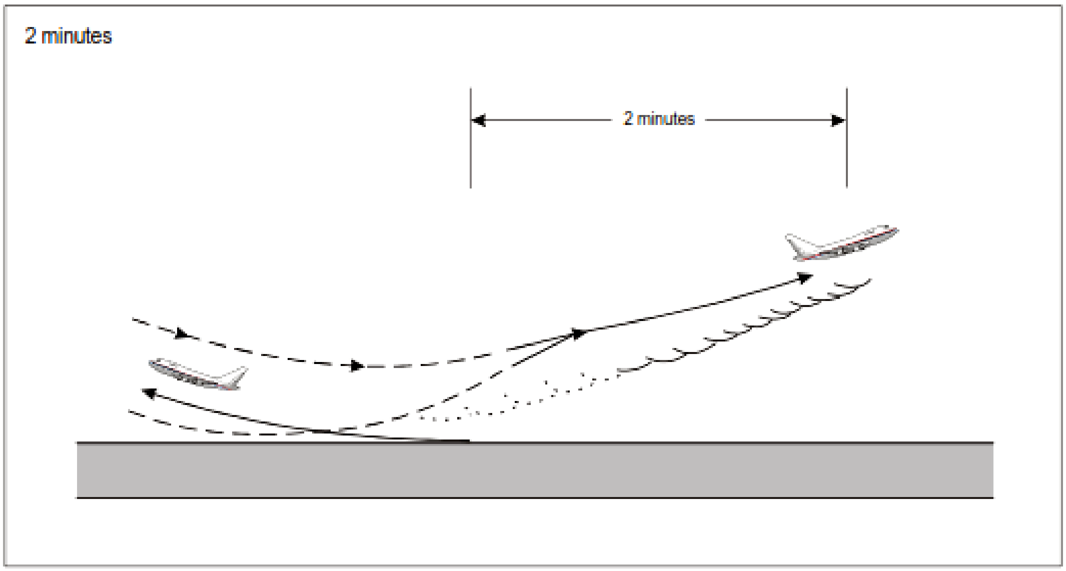


Figure 5-34: Two-Minute wake turbulence separation minima for opposite-direction take-off

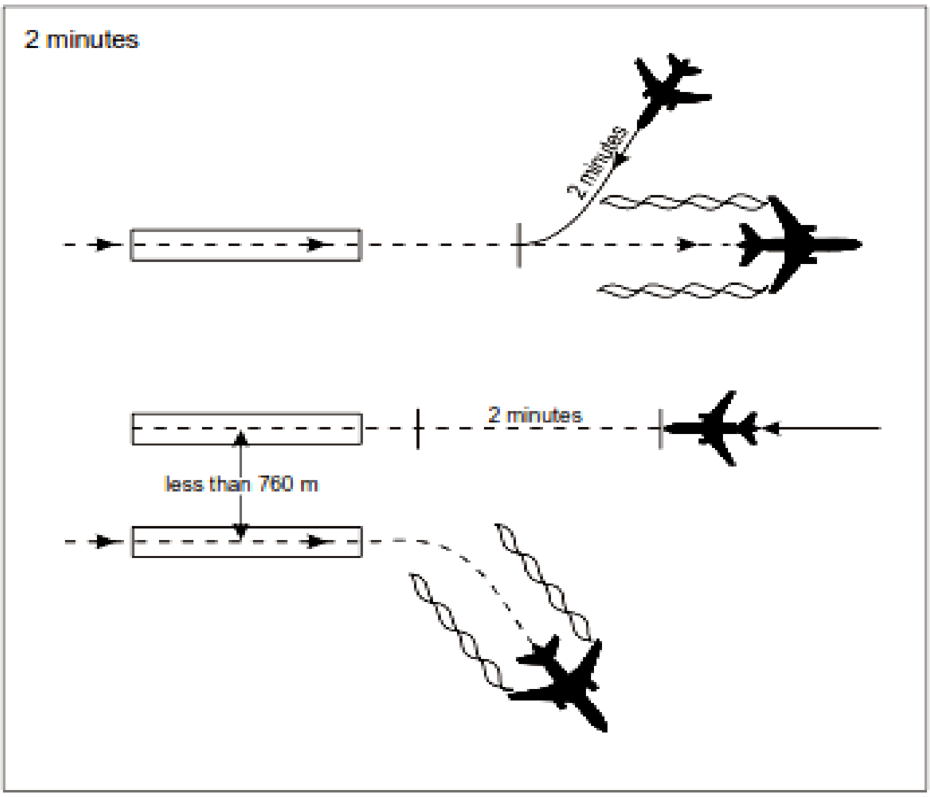


Figure 5-35: Two-minute wake turbulence separation minima for opposite-direction/parallel opposite direction landing.

Note: Wake Vortex generation begins when the nose wheel lifts off the runway on take-off and continues until the nose wheel touches down on landing (see Figure 5-36)

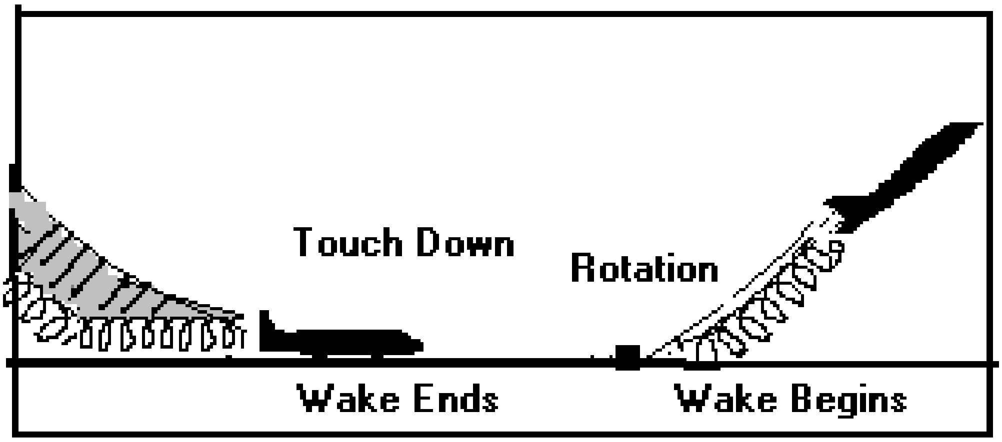


Figure 5-36: Illustration of generation of wake vortices

CHAPTER 6

PROCEDURES/ SEPARATION IN THE VICINITY OF AERODROMES

6.1 REDUCTION IN SEPARATION MINIMA IN THE VICINITY OF AERODROMES

6.1.1 The separation minima detailed in Chapter 5, 5.4.and 5.5, may be reduced in the vicinity of aerodromes if:

a) adequate separation can be provided by the aerodrome controller when each aircraft is continuously visible to this controller; or

b) each aircraft is continuously visible to flight crews of the other aircraft concerned and the pilots thereof report that they can maintain their own separation; or

c) in the case of one aircraft following another, the flight crew of the succeeding aircraft reports that the other aircraft is in sight and separation can be maintained.

6.2 ESSENTIAL LOCAL TRAFFIC

6.2.1 Information on essential local traffic known to the controller shall be transmitted without delay to departing and arriving aircraft concerned**.**

Note .— Essential local traffic in this context consists of any aircraft, vehicle or personnel on or near the runway to be used, or traffic in the take-off and climb-out area or the final approach area, which may constitute a collision hazard to a departing or arriving aircraft.

6.2.2 Essential local traffic shall be described so as to be easily identified.

6.3 PROCEDURES FOR DEPARTING AIRCRAFT

6.3.1 General

6.3.1.1 Clearances for departing aircraft shall specify, when necessary for the separation of aircraft, direction of takeoff and turn after take-off; heading or track to be made good before taking up the cleared departure track; level to maintain before continuing climb to assigned level; time, point and/or rate at which a level change shall be made; and any other necessary manoeuvre consistent with safe operation of the aircraft.

6.3.1.2 At aerodromes where standard instrument departures (SIDs) have been established, departing aircraft should normally be cleared to follow the appropriate SID.

6.3.2 Standard clearances for departing aircraft

6.3.2.1 **General**

6.3.2.1.1 The ATS In-charge should, wherever possible, establish standardized procedures for transfer of control between the ATC units concerned, and standard clearances for departing aircraft.

6.3.2.2 **Coordination**

6.3.2.2.1 Where standard clearances for departing aircraft have been agreed to between the units concerned, the aerodrome control tower will normally issue the appropriate standard clearance without prior coordination with or approval from the approach control unit or ACC.

6.3.2.2.2 Prior coordination of clearances should be required only in the event that a variation to the standard clearance or the standardized transfer of control procedures is necessary or desirable for operational reasons.

6.3.2.2.3 Provision shall be made to ensure that the approach control unit at all times is kept informed of the sequence in which aircraft will depart as well as the runway to be used.

6.3.2.2.4 Provision shall be made to display the designators of assigned SIDs to the aerodrome control tower, the approach control unit and/or the ACC as applicable.

6.3.2.3 **Contents**

6.3.2.3.1 Standard clearances for departing aircraft shall contain the following items:

a) aircraft identification;

b) clearance limit, normally destination aerodrome;

c) designator of the assigned SID, if applicable;

d) cleared level,

e) allocated SSR code;

f) any other necessary instructions or information not contained in the SID description, e.g. instructions relating to change of frequency.

Note 1. — See 6.3.2.4 for clearances to aircraft on SID.

Note 2.— The use of a SID designator without a cleared level does not authorize the aircraft to climb on the SID vertical profile.

6.3.2.4 **Clearances on a SID**

6.3.2.4.1 Clearances to aircraft on a SID with remaining published level and/or speed restrictions shall indicate if such restrictions are to be followed or are cancelled. The following phraseologies shall be used with the following meanings:

a) CLIMB VIA SID TO *(level):*

i. climb to the cleared level and comply with published level restrictions;
ii. follow the lateral profile of the SID; and
iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

b) CLIMB VIA SID TO *(level)*, CANCEL LEVEL RESTRICTION(S):

i. climb to the cleared level, published level restrictions are cancelled;
ii. follow the lateral profile of the SID; and
iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

c) CLIMB VIA SID TO *(level)*, CANCEL LEVEL RESTRICTION(S) AT (*point(s)*):

i. climb to the cleared level, published level restriction(s) at the specified point(s) are cancelled;
ii. follow the lateral profile of the SID; and
iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

d) CLIMB VIA SID TO *(level)*, CANCEL SPEED RESTRICTION(S):

i. climb to the cleared level and comply with published level restrictions;
ii. follow the lateral profile of the SID; and
iii. published speed restrictions and ATC-issued speed control instructions are cancelled.

e) CLIMB VIA SID TO *(level),* CANCEL SPEED RESTRICTION(S) AT (*point(s)*):

i. climb to the cleared level and comply with published level restrictions;
ii. follow the lateral profile of the SID; and
iii. published speed restrictions are cancelled at the specified point(s).

f) CLIMB UNRESTRICTED TO *(level)* or CLIMB TO *(level)*, CANCEL LEVEL AND SPEED RESTRICTION(S):

i. climb to the cleared level, published level restrictions are cancelled;
ii. follow the lateral profile of the SID; and
iii. published speed restrictions and ATC-issued speed control instructions are cancelled.

6.3.2.4.2 If there are no remaining published level or speed restrictions on the SID, the phrase CLIMB TO *(level)* should be used.

6.3.2.4.3 When subsequent speed restriction instructions are issued, and if the cleared level is unchanged, the phrase CLIMB VIA SID TO *(level)* should be omitted.

6.3.2.4.4 When a departing aircraft is cleared to proceed direct to a published waypoint on the SID, the speed and level restrictions associated with the bypassed waypoints are cancelled. All remaining published speed and level restrictions shall remain applicable.

6.3.2.4.5 When a departing aircraft is vectored or cleared to proceed to a point that is not on the SID, all the published speed and level restrictions of the SID are cancelled and the controller shall:

a) reiterate the cleared level;
b) provide speed and level restrictions as necessary; and
c) notify the pilot if it is expected that the aircraft will be instructed to subsequently rejoin the SID.

6.3.2.4.6 ATC instructions to an aircraft to rejoin a SID shall include:

a) the designator of the SID to be rejoined unless advance notification of rejoin has been provided in accordance with 6.3.2.4.5;
b) the cleared level in accordance with 6.3.2.4.1; and
c) the position at which it is expected to rejoin the SID.

6.3.2.5 **Communication failure**

6.3.2.5.1 Clearances for departing aircraft may specify a cleared level other than that indicated in the filed flight plan for the en-route phase of flight, without a time or geographical limit for the cleared level. Such clearances will normally be used to facilitate the application of tactical control methods by ATC, normally through the use of an ATS surveillance system.

6.3.2.5.2 Where clearances for departing aircraft contain no time or geographical limit for a cleared level, action to be taken by an aircraft experiencing air-ground communication failure in the event the aircraft has been vectored away by using ATS surveillance system, from the route specified in its current flight plan should be prescribed and included in the SID description or published in AIPs.

6.3.3 Departure Sequence

6.3.3.1 Departing aircraft may be expedited by suggesting a take-off direction which is not into the wind. It is the responsibility of the pilot-in-command of an aircraft to decide between making such a take-off or waiting for take-off in a preferred direction.

6.3.3.2 If departures are delayed, the delayed flights shall normally be cleared in an order based on their estimated time of departure, except that deviation from this order may be made to:

a) facilitate the maximum number of departures with the least average delay;

b) accommodate requests by an operator in respect of that operator’s flights to the extent practicable.

6.3.3.3 Air traffic control units should when practicable advise aircraft operators or their designated representatives when anticipated delays are expected to exceed 30 minutes.

6.4 INFORMATION FOR DEPARTING AIRCRAFT

6.4.1 Meteorological conditions

6.4.1.1 Information regarding significant changes in the meteorological conditions in the take-off or climb-out area, obtained by the unit providing approach control service after a departing aircraft has established communication with such unit, shall be transmitted to the aircraft without delay, except when it is known that the aircraft already has received the information.

Note.— Significant changes in this context include those relating to surface wind direction or speed, visibility, runway visual range or air temperature (for turbine-engine aircraft), and the occurrence of thunderstorm or cumulonimbus, moderate or severe turbulence, wind shear, hail, moderate or severe icing, severe squall line, freezing precipitation, severe mountain waves, sand storm, dust storm, blowing snow, tornado or waterspout.

6.4.2 Operational status of visual or non-visual aids

6.4.2.1 Information regarding changes in the operational status of visual or non-visual aids essential for take-off and climb shall be transmitted without delay to a departing aircraft, except when it is known that the aircraft already has received the information.

6.5 PROCEDURES FOR ARRIVING AIRCRAFT

6.5.1 General

6.5.1.1 When it becomes evident that delays will be encountered by arriving aircraft, operators or designated representatives shall, to the extent practicable, be notified and kept currently informed of any changes in such expected delays.

6.5.1.2 The controller may request an arriving aircraft to report when leaving or passing a significant point or navigation aid, or when starting procedure turn or base turn, or any other information, to expedite departing and arriving aircraft.

6.5.1.3 An IFR flight shall not be cleared for an initial approach below the Minimum Sector Altitude (MSA), nor to descend below that altitude unless:

a) the pilot has reported passing an appropriate point defined by a navigation aid or as a waypoint; or

b) the pilot reports that the aerodrome is and can be maintained in sight; or

c) the aircraft is conducting a visual approach; or

d) the controller has determined the aircraft's position by the use of ATS surveillance system, and a lower minimum altitude has been specified for use when providing ATS surveillance services.

6.5.1.4 At aerodromes where standard instrument arrivals (STARs) have been established, arriving aircraft should normally be cleared to follow the appropriate STAR. The aircraft shall be informed of the type of approach to expect and runway-in-use as early as possible.

6.5.1.5 After coordination with the approach control unit, the ACC may clear the first arriving aircraft for approach rather than to a holding fix.

6.5.2 Standard clearances for arriving aircraft

6.5.2.1 **General**

6.5.2.1.1 ATS In-charge should, wherever possible, establish standardized procedures for transfer of control between the ATC units concerned, and standard clearances for arriving aircraft.

6.5.2.2 **Coordination**

6.5.2.2.1 Where standard clearances for arriving aircraft are in use and, provided no terminal delay is expected, clearance to follow the appropriate STAR will normally be issued by the ACC without prior coordination with or approval from the approach control unit or the aerodrome control tower as applicable.

6.5.2.2.2 Prior coordination of clearances should be required only in the event that a variation to the standard clearance or the standardized transfer of control procedures is necessary or desirable for operational reasons.

6.5.2.2.3 Provision shall be made to ensure that the approach control unit is at all times kept informed of the sequence of aircraft following the same STAR.

6.5.2.2.4 Provision shall be made to display the designators of assigned STARs to the ACC, the approach control unit and/or the aerodrome control tower, as applicable.

6.5.2.3 **Contents**

6.5.2.3.1 Standard clearances for arriving aircraft shall contain the following items:

a) aircraft identification;

b) designator of the assigned STAR if applicable;

c) runway-in-use, except when part of the STAR description;

d) cleared level, and

e) any other necessary instructions or information not contained in the STAR description, e.g. change of communication

Note 1.— See 6.5.2.4.1 for clearances on a STAR.

Note 2.— The use of a STAR designator without a cleared level does not authorize the aircraft to descend on the STAR vertical profile.

6.5.2.4 **Clearances on a STAR**

6.5.2.4.1 Clearances to aircraft on a STAR with remaining published level and/or speed restrictions shall indicate if such restrictions are to be followed or are cancelled. The following phraseologies shall be used with the following meaning:

a) DESCEND VIA STAR TO *(level)*:

  i. descend to the cleared level and comply with published level restrictions;
  ii. follow the lateral profile of the STAR; and
  iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

b) DESCEND VIA STAR TO *(level)*, CANCEL LEVEL RESTRICTION(S):

  i. descend to the cleared level, published level restrictions are cancelled;
  ii. follow the lateral profile of the STAR; and
  iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

c) DESCEND VIA STAR TO *(level)*, CANCEL LEVEL RESTRICTION(S) AT (*point(s)*):

  i. descend to the cleared level, published level restriction(s) at the specified point(s) are cancelled;
  ii. follow the lateral profile of the STAR; and
  iii. comply with published speed restrictions or ATC-issued speed control instructions as applicable.

d) DESCEND VIA STAR TO *(level)*, CANCEL SPEED RESTRICTION(S):

  i. descend to the cleared level and comply with published level restrictions;
  ii. follow the lateral profile of the STAR; and
  iii. published speed restrictions and ATC-issued speed control instructions are cancelled.

e) DESCEND VIA STAR TO *(level)*, CANCEL SPEED RESTRICTION(S) AT (*point(s)*):

  i. descend to the cleared level and comply with published level restrictions;
  ii. follow the lateral profile of the STAR; and
  iii. published speed restrictions are cancelled at the specified point(s).

f) DESCEND UNRESTRICTED TO *(level)* or DESCEND TO *(level)*, CANCEL LEVEL AND SPEED RESTRICTION(S):

  i. descend to the cleared level, published level restrictions are cancelled;
  ii. follow the lateral profile of the STAR; and

iii. published speed restrictions and ATC-issued speed control instructions are cancelled.

6.5.2.4.2 If there are no remaining published level or speed restrictions on the STAR, the phrase DESCEND TO *(level)* should be used.

6.5.2.4.3 When subsequent speed restriction instructions are issued and if the cleared level is unchanged, the phrase DESCEND VIA STAR TO *(level)* should be omitted.

6.5.2.4.4 When an arriving aircraft is cleared to proceed direct to a published waypoint on the STAR, the speed and level restrictions associated with the bypassed waypoints are cancelled. All remaining published speed and level restrictions shall remain applicable.

6.5.2.4.5 When an arriving aircraft is vectored or cleared to proceed to a point that is not on the STAR, all the published speed and level restrictions of the STAR are cancelled and the controller shall:

a) reiterate the cleared level;
b) provide speed and level restrictions as necessary and;
c) notify the pilot if it is expected that the aircraft will be instructed to subsequently rejoin the STAR.

6.5.2.4.6 ATC instructions to an aircraft to rejoin a STAR shall include:

a) the designator of the STAR to be rejoined, unless advance notification of rejoin has been provided in accordance with 6.5.2.4.5;
b) the cleared level on rejoining the STAR in accordance with 6.5.2.4.1; and
c) the position at which it is expected to rejoin the STAR.

6.5.3 Visual Approach

6.5.3.1 Visual approach is an approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

6.5.3.2 Clearance for an IFR flight to execute a visual approach may be requested by the pilot or initiated by the controller.

6.5.3.3 The controller shall not initiate a visual approach when there is a reason to believe that the flight crew concerned is not familiar with the aerodrome and its surrounding terrain.

6.5.3.4 Controller should take into consideration the prevailing traffic and meteorological conditions before initiating visual approach.

6.5.3.5 Aircraft may be cleared for direct base leg/ final, if there is reasonable assurance that visual approach and landing can be completed.

6.5.3.6 Separation shall be provided between an aircraft cleared to execute a visual approach and other arriving and departing aircraft.

6.5.3.7 When clearance to execute visual approach has been issued, it shall be the responsibility of pilot to maintain terrain clearance.

6.5.3.8 **Visual approach initiated by flight crew:**

6.5.3.8.1 A flight crew may request visual approach if he has runway in sight and the pilot can maintain visual reference to terrain subject to the following conditions:

a. Ground visibility is not below the higher of reported aerodrome operating minima of associated non-precision approach or minimum visibility/RVR of 2800 m for Category A/B aeroplanes, 3200 m for Category C aeroplanes and 3600 m for Category D aeroplanes. If visual approach is requested for a runway which has only a circling approach, the ground visibility shall not be less than 5 Km, and

b. either, the reported ceiling is at or above the level of the beginning of the initial approach segment; or

c. the pilot reports at the level of the beginning of the initial approach segment or at any time during the instrument approach procedure that the meteorological conditions are such that with reasonable assurance a visual approach and landing can be completed.

6.5.3.8.2 The pilot at the time of requesting for visual approach should give position report.

6.5.3.8.3 The pilot shall advise the controller immediately when

a) weather has deteriorated and unable to keep the terrain in sight; or

b) unable to continue flight following the preceding aircraft; or

c) additional spacing is required from preceding aircraft.

6.5.3.9 Visual approach initiated by an Approach controller (Procedural):

6.5.3.9.1 The Approach controller (procedural) may initiate visual approach subject to following conditions

a) Ground visibility is not below the higher of reported aerodrome operating minima of associated non-precision approach or minimum visibility/RVR of 2800 m for Category A/B aeroplanes, 3200 m for Category C aeroplanes and 3600 m for Category D aeroplanes. If visual approach is requested for a runway which has only a circling approach, the ground visibility shall not be less than 5 Km, and

b) Concurrence of the flight crew is obtained, and

c) The reported ceiling is at or above the approved initial approach level.

6.5.3.9.2 Clearance to execute a visual approach shall only be issued provided the aircraft can maintain visual reference to terrain and has the runway in sight.

Phraseologies:

- *ADVISE ABLE TO ACCEPT VISUAL APPROACH RUNWAY (number);*
- *EXPECT VISUAL APPROACH RUNWAY (number),*
- *REPORT TERRAIN IN SIGHT*
- *REPORT RUNWAY IN SIGHT;*
- *CLEARED VISUAL APPROACH RUNWAY (number), REPORT (position in the traffic circuit).*

6.5.3.10 **Visual approach initiated by an Approach controller (Surveillance):**

Note: Refer Chapter 8, section 8.20.6, Vectoring for Visual Approach.

6.5.3.11 **Successive visual approaches:**

6.5.3.11.1 For successive visual approaches, separation shall be maintained by the controller until the pilot of a succeeding aircraft reports having the preceding aircraft in sight. The aircraft shall then be instructed to follow and maintain own separation from the preceding aircraft and report runway in sight.

Phraseologies:

- *REPORT NUMBER (number) (aircraft type and position) IN SIGHT*
- *CLEARED VISUAL APPROACH RUNWAY (number) MAINTAIN OWN SEPARATION FROM PRECEDING [CAUTION WAKE TURBULENCE]*
- *REPORT RUNWAY IN SIGHT*

6.5.3.11.2 When both aircraft are of a heavy wake turbulence category, or the preceding aircraft is of heavier wake turbulence category than the following, and the distance between the aircraft is less than the appropriate wake turbulence minimum, the controller shall issue caution of possible wake turbulence.

Phraseology: CAUTION WAKE TURBULENCE

6.5.3.11.3 The pilot-in-command of the aircraft concerned shall be responsible for ensuring that the spacing from a preceding aircraft of a heavier wake turbulence category is acceptable. If it is determined that additional spacing is required, the flight crew shall inform the ATC unit accordingly, stating their requirements.

6.5.3.12 Transfer of communication to the Aerodrome controller should be effected at such a point or time that information on essential local traffic, if applicable, and clearance to land or alternative instruction can be issued to the aircraft in a timely manner.

6.5.3.13 The aerodrome controller should endeavour to sight the aircraft and upon sighting should inform the pilot so. The landing clearance should be issued by the controller only after sighting the aircraft.

Phraseology: AIC112 IN SIGHT RUNWAY 27 CLEARED TO LAND

6.5.4 Instrument approach

6.5.4.1 The approach control unit shall specify the instrument approach procedure to be used by arriving aircraft. A flight crew may request an alternative procedure and, if circumstances permit, should be cleared accordingly.

6.5.4.2 If a pilot reports or it is clearly apparent to the ATC unit that the pilot is not familiar with an instrument approach procedure, the initial approach level, the point (in minutes from the appropriate reporting point) at which base turn or procedure turn will be started, the level at which the procedure turn shall be carried out and the final approach track shall be specified, except that only the last-mentioned need be specified if the aircraft is to be cleared for a straight-in approach. The frequency(ies) of the navigation aid(s) to be used as well as the missed approach procedure shall also be specified when deemed necessary.

6.5.4.3 If visual reference to terrain is established before completion of the approach procedure, the entire procedure must nevertheless be executed unless the aircraft requests & is cleared for a visual approach.

6.5.5 Holding

6.5.5.1 In the event of extended delays, aircraft should be advised of the anticipated delay as early as possible and, when practicable, be instructed or given the option to reduce speed en-route in order to absorb delay.

6.5.5.2 When delay is expected, the ACC shall normally be responsible for clearing aircraft to the holding fix, and for including holding instructions, and expected approach time or onward clearance time, as applicable, in such clearances.

6.5.5.3 After coordination with the approach control unit, the ACC may clear arriving aircraft to visual holding location to hold until further advised by the approach control unit.

6.5.5.4 After coordination with the aerodrome control tower, the approach control unit may clear arriving aircraft to visual holding location to hold until further advised by the aerodrome control tower.

6.5.5.5 Holding and holding pattern entry shall be accomplished in accordance with published procedures. If entry and holding procedures have not been published or if the procedures are not known to a flight crew, the appropriate air traffic control unit shall specify the designator of the location or aid to be used, the inbound track, radial or bearing, direction of turn in the holding pattern as well as the time of the outbound leg or the distances between which to hold.

6.5.5.6 Aircraft should normally be held at a designated holding fix. The required minimum vertical, lateral or longitudinal separation from other aircraft shall be provided. Criteria and procedures for the simultaneous use of adjacent holding patterns shall be prescribed in local instructions.

6.5.5.7 Levels at holding fix or visual holding location shall as far as practicable be assigned in a manner that will facilitate clearing each aircraft to approach in its proper priority. Normally, the first aircraft to arrive over a holding fix or visual holding location should be at the lowest level, with following aircraft at successively higher levels.

6.5.5.8 When extended holding is anticipated, turbojet aircraft should, when practicable, be permitted to hold at higher levels in order to conserve fuel, whilst retaining their order in the approach sequence.

6.5.5.9 If an aircraft is unable to comply with the published or cleared holding procedure, alternative instructions shall be issued.

6.5.5.10 For the purpose of maintaining a safe and orderly flow of traffic, an aircraft may be instructed to orbit at its present or at any other position, provided the required obstacle clearance is ensured.

6.5.6 Approach sequence

6.5.6.1 The following procedures shall be applied whenever approaches are in progress.

6.5.6.1.1 The approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least average delay. Priority shall be given to:

a) an aircraft which anticipates being compelled to land because of factors affecting the safe operation of the aircraft (engine failure, shortage of fuel, etc.);

b) hospital aircraft or aircraft carrying any sick or seriously injured person requiring urgent medical attention;

c) aircraft engaged in search and rescue operations; and

d) VIP I (President), VIP II (Vice President), VIP III (Prime Minister) and VIP V (Foreign Heads of State/Govt.) aircraft.

6.5.6.1.2 Succeeding aircraft shall be cleared for approach:

a) when the preceding aircraft has reported that it is able to complete its approach without encountering instrument meteorological conditions; or

b) when the preceding aircraft is in communication with and sighted by the aerodrome control tower and reasonable assurance exists that a normal landing can be accomplished, or

c) when timed approaches are used, the preceding aircraft has passed the defined point inbound and reasonable assurance exists that a normal landing can be accomplished;

d) when the use of an ATS surveillance system confirms that the required longitudinal spacing between succeeding aircraft has been established.

6.5.6.1.3 In establishing the approach sequence, the need for increased longitudinal spacing between arriving aircraft due to wake turbulence shall be taken into account.

6.5.6.1.4 If the pilot of an aircraft in an approach sequence has indicated an intention to hold for weather improvement, or for other reasons, such action shall be approved. However, when other holding aircraft indicate intention to continue their approach-to-land, the pilot desiring to hold will be cleared to an adjacent fix for holding awaiting weather change or re-routing. Alternatively, the aircraft should be given a clearance to place it at the top of the approach sequence so that other holding aircraft may be permitted to land. Coordination shall be effected with any adjacent ATC unit or control sector, when required, to avoid conflict with the traffic under the jurisdiction of that unit or sector.

6.5.6.1.5 When establishing the approach sequence, an aircraft which has been authorized to absorb a specified period of notified terminal delay by cruising at a reduced speed en route, should, in so far as practicable, be credited with the time absorbed en route.

6.5.7 Expected approach time

6.5.7.1 An expected approach time shall be determined for an arriving aircraft that will be subjected to a delay of 10 minutes or more. The expected approach time shall be transmitted to the aircraft as soon as practicable as and preferably not later than at the commencement of its initial descent from cruising level. A revised expected approach time shall be transmitted to the aircraft without delay whenever it differs from that previously transmitted by 5 minutes or more, or such lesser period of time as agreed between the ATS units concerned.

6.5.7.2 An expected approach time shall be transmitted to the aircraft by the most expeditious means whenever it is anticipated that the aircraft will be required to hold for

30 minutes or more.

6.5.7.3 The holding fix to which an expected approach time relates shall be identified together with the expected approach time whenever circumstances are such that this would not otherwise be evident to the pilot.

6.5.8 Onward clearance time

6.5.8.1 In the event an aircraft is held en route or at a location or aid other than the initial approach fix, the aircraft concerned shall, as soon as practicable, be given an expected onward clearance time from the holding fix . The aircraft shall also be advised if further holding at subsequent holding fix is expected.

Note.— "Onward clearance time" is the time at which an aircraft can expect to leave the fix at which it is being held.

6.6 INFORMATION FOR ARRIVING AIRCRAFT

6.6.1 As early as practicable after an aircraft has established communication with the unit providing approach control service, the following elements of information, in the order listed, shall be transmitted to the aircraft, with the exception of such elements which it is known the aircraft has already received:

a) type of approach and runway-in-use;

b) meteorological information, as follows:

   i. surface wind direction and speed, including significant variations;

   ii. visibility and, when applicable, runway visual range (RVR);

   iii. present weather;

   iv. cloud below 5 000 ft or below the highest minimum sector altitude, whichever is greater; cumulonimbus;

   v. air temperature;

   vi. dew point temperature;

   vii. altimeter setting(s);

   viii. any available information on significant meteorological phenomena in the approach area; and

   ix. trend-type landing forecast, when available.

c) current runway surface conditions, in case of precipitants or other temporary hazards;

d) changes in the operational status of visual and non visual aids essential for approach and landing.

6.6.2 If it becomes necessary or operationally desirable that an arriving aircraft follow an instrument approach procedure or use a runway other than that initially stated, the flight crew shall be advised without delay.

6.6.3 At the commencement of final approach, the following information shall be transmitted to aircraft:

a) significant changes in the mean surface wind direction and speed;

Note.— If the controller possesses wind information in the form of components, the significant changes are:

- *Mean head-wind component: 10 kt*
- *Mean tail-wind component: 2 kt*
- *Mean cross-wind component: 5 kt*

b) the latest information, if any, on wind shear and/or turbulence in the final approach area;

c) the current visibility representative of the direction of approach and landing or, when provided, the current runway visual range value(s) and the trend, if practicable, supplemented by slant visual range value(s), if provided.

6.6.4 During final approach, the following information shall be transmitted without delay:

a) the sudden occurrence of hazards (e.g. unauthorized traffic on the runway);

b) significant variations in the current surface wind, expressed in terms of minimum and maximum values;

c) significant changes in runway surface conditions;

d) changes in the operational status of required visual or non-visual aids;

e) changes in observed RVR value(s), in accordance with the reported scale in use, or changes in the visibility representative of the direction of approach and landing.

CHAPTER 7

AERODROME CONTROL SERVICE

7.1 FUNCTIONS OF AERODROME CONTROL TOWERS

7.1.1 General

7.1.1.1 Aerodrome control towers shall issue information and clearances to aircraft under their control to achieve a safe, orderly and expeditious flow of air traffic on and in the vicinity of an aerodrome with the object of preventing collision(s) between:

a) aircraft flying within the designated area of responsibility of the control tower, including the aerodrome traffic circuits;

b) aircraft operating on the manoeuvring area;

c) aircraft landing and taking off;

d) aircraft and vehicles operating on the manoeuvring area;

e) aircraft on the manoeuvring area and obstructions on that area.

7.1.1.2 Aerodrome controllers shall maintain a continuous watch on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel on the manoeuvring area. Watch shall be maintained by visual observation, augmented in low visibility conditions by an ATS surveillance system when available. Traffic shall be controlled in accordance with the procedures set forth herein and all applicable traffic rules specified in MATS- Part 2/ Temporary Local Instructions (TLI) of the concerned airport. If there are other aerodromes within a control zone, traffic at all aerodromes within such a zone shall be coordinated so that traffic circuits do not conflict.

7.1.1.3 The functions of an aerodrome control tower may be performed by different control or working positions, such as:

- **aerodrome controller**, normally responsible for operations on the runway and aircraft flying within the area of responsibility of the aerodrome control tower;
- **ground controller**, normally responsible for traffic on the manoeuvring area with the exception of runways;
- **Clearance delivery position**, normally responsible for delivery of start-up and ATC clearance to departing IFR flights.

7.1.1.4 Where parallel or near parallel runways are used for simultaneous operations, individual aerodrome controllers should be responsible for operations on each of the runways.

7.1.2 Alerting service provided by aerodrome control towers

7.1.2.1 Aerodrome control towers are responsible for alerting the rescue and fire-fighting services whenever:

a) an aircraft accident has occurred on or in the vicinity of the aerodrome; or

b) information is received that the safety of an aircraft which is or will come under the jurisdiction of the aerodrome control tower may have or has been impaired; or

c) requested by the flight crew; or

d) when otherwise deemed necessary or desirable.

7.1.2.2 Procedures concerning the alerting of the rescue and fire fighting services shall be contained in local instructions. Such instructions shall specify the type of information to be provided to the rescue and fire fighting services, including type of aircraft and type of emergency and, when available, number of persons on board, and any dangerous goods carried on the aircraft.

7.1.2.3 Aircraft which fail to report after having been transferred to an aerodrome control tower, or, having once reported, cease radio contact and in either case fail to land five minutes after the expected landing time, shall be reported to the approach control unit, ACC or flight information centre, or to the rescue coordination centre or rescue sub-centre, in accordance with local instructions.

7.1.3 Failure or irregularity of aids and equipment

7.1.3.1 Aerodrome control towers shall immediately report in accordance with local instructions any failure or irregularity of operation in any equipment, light or other device established at an aerodrome for the guidance of aerodrome traffic and flight crews or required for provision of air traffic control service.

7.2 SELECTION OF RUNWAY-IN-USE

7.2.1 The term “runway-in-use” shall be used to indicate the runway or runways that, at a particular time, are considered by the aerodrome control tower to be the most suitable for use by the types of aircraft expected to land or take off at the aerodrome.

7.2.2 In selecting runway-in-use the unit providing aerodrome control service shall take into consideration, besides surface wind speed and direction, other relevant factors such as the aerodrome traffic circuits, the length of runways, and the approach and landing aids available.

7.2.3 A runway for take-off or landing, appropriate to the operation, may be nominated for noise abatement purposes, the objective being to utilize whenever possible those runways that permit aeroplanes to avoid noise-sensitive areas during the initial departure and final approach phases of flight.

7.2.4 Whenever change of the runway-in-use is necessary the aerodrome controller, after prior consultation with approach control, shall inform to aircraft under his control and other agencies according to local instructions.

7.3 INITIAL CALL TO AERODROME CONTROL TOWER

7.3.1 For aircraft being provided with aerodrome control service, the initial call shall contain:

i) designation of station being called;
ii) call sign and for aircraft in the heavy wake turbulence category, the word "Heavy" and for Airbus 380, the word "Super";
iii) position; and
iv) additional elements, as required by Aeronautical Information Publication.

7.4 INFORMATION TO AIRCRAFT BY AERODROME CONTROL TOWERS

7.4.1 Information related to the operation of aircraft

7.4.1.1 Start-Up Time Procedures:

7.4.1.1.1 Start-up time procedures should be contained in the local instructions/MATS-Part 2 and should specify the criteria and conditions for determining when and how start-up times shall be calculated and issued to departing aircraft.

7.4.1.1.2 If a start-up clearance is withheld, the flight crew shall be advised of the reason.

7.4.1.2 Aerodrome and Meteorological Information

7.4.1.2.1 Prior to taxiing for take-off, aircraft shall be advised of the following elements of information, in the order listed, with the exception of such elements which it is known the aircraft has already received:

a) the runway to be used;

b) the surface wind direction and speed, including significant variations therefrom;

c) the QNH altimeter setting and, either on a regular basis in accordance with local arrangements or if so requested by the aircraft, the QFE altimeter setting;

d) the air temperature for the runway to be used, in the case of turbine-engined aircraft;

e) the visibility representative of the direction of take-off and initial climb, if less than 10 km, or, when applicable, the RVR value(s) for the runway to be used;

f) the correct time.

7.4.1.2.2 Prior to take-off aircraft shall be advised of:

a) any significant changes in the surface wind direction and speed, the air temperature, and the visibility or RVR value(s) given in accordance with 7.4.1.2.1;
b) significant meteorological conditions in the take-off and climb-out area, except when it is known that the information has already been received by the aircraft.

Note.— Significant meteorological conditions in this context include the occurrence or expected occurrence of cumulonimbus or thunderstorm, moderate or severe turbulence, wind shear, hail, moderate or severe icing, severe squall line, freezing precipitation, severe mountain waves, sand storm, dust storm, blowing snow, tornado or waterspout in the take-off and climb-out area.

7.4.1.2.3 Prior to entering the traffic circuit or commencing its approach to land, an aircraft shall be provided with the following elements of information, in the order listed, with the exception of such elements which it is known the aircraft has already received:

a) the runway to be used;
b) the surface wind direction and speed, including significant variations therefrom;
c) the QNH altimeter setting and, either on a regular basis in accordance with local arrangements or, if so requested by the aircraft, the QFE altimeter setting.

7.4.1.3 Essential Local Traffic Information

7.4.1.3.1 Information on essential local traffic shall be issued in a timely manner, either directly or through the unit providing approach control service when, in the judgment of the aerodrome controller, such information is necessary in the interests of safety, or when requested by aircraft.

7.4.1.3.2 Essential local traffic shall be considered to consist of any aircraft, vehicle or personnel on or near the manoeuvring area, or traffic operating in the vicinity of the aerodrome, which may constitute a hazard to the aircraft concerned.

7.4.1.3.3 Essential local traffic shall be described so as to be easily identified.

7.4.1.4 Runway Incursion or Obstructed Runway

7.4.1.4.1 In the event the aerodrome controller observes, after a take-off clearance or a landing clearance has been issued, any obstruction on the runway likely to impair the safety of an aircraft taking off or landing, such as a runway incursion by an aircraft or vehicle, or animals or flocks of birds on the runway, appropriate action shall be taken as follows:

a) cancel the take-off clearance for a departing aircraft;
b) instruct a landing aircraft to execute a go around or missed approach.
c) in all cases inform the aircraft concerned of the runway incursion or obstruction and its location in relation to the runway;

7.4.1.5 Uncertainty of position on the manoeuvring area

7.4.1.5.1 In the event the aerodrome controller becomes aware of an aircraft or vehicle that is lost or uncertain of its position on the manoeuvring area, appropriate action shall be taken immediately to safeguard operations and assist the aircraft or vehicle concerned to determine its position.

7.4.1.6 Wake Turbulence and Jet Blast Hazard

7.4.1.6.1 Aerodrome controllers shall, when applicable, apply the wake turbulence separation minima specified in Chapter 5. Whenever the responsibility for wake turbulence avoidance rests with the pilot-in-command, aerodrome controllers shall, to the extent practicable, advice aircraft of the expected occurrence of hazards caused by turbulent wake.

7.4.1.6.2 In issuing clearances or instructions, air traffic controllers should take into account the hazards caused by jet blast and propeller slipstream to taxiing aircraft, to aircraft taking off or landing, particularly when intersecting runways are being used, and to vehicles and personnel operating on the aerodrome.

7.4.1.7 Abnormal Aircraft Configuration and Condition

7.4.1.7.1 Whenever an abnormal configuration or condition of an aircraft including conditions such as landing gear not extended or only partly extended, or unusual smoke emissions from any part of the aircraft, is observed by or reported to the aerodrome controller, the aircraft concerned shall be advised without delay.

7.4.1.7.2 When requested by the flight crew of a departing aircraft suspecting damage to the aircraft, the departure runway used shall be inspected without delay and the flight crew advised in the most expeditious manner as to whether any aircraft debris or bird or animal remains have been found or not.

7.5 ESSENTIAL INFORMATION ON AERODROME CONDITIONS

7.5.1 Essential information on aerodrome conditions is information necessary to safety in the operation of aircraft, which pertains to the movement area or any facilities usually associated therewith.

7.5.2 Essential information on aerodrome conditions shall include information relating to the following:

a) construction or maintenance work on, or immediately adjacent to the movement area;

b) rough or broken surfaces on a runway, a taxiway or an apron, whether marked or not;

c) snow, slush or ice on a runway, a taxiway or an apron;

d) water on a runway, a taxiway or an apron;

e) snow banks or drifts adjacent to a runway, a taxiway or an apron;

f) other temporary hazards, including parked aircraft and birds on the ground or in the air;

g) failure or irregular operation of part or all of the aerodrome lighting system;

h) any other pertinent information.

7.5.3 Essential information on aerodrome conditions shall be given to every aircraft, except when it is known that the aircraft already has received all or part of the information from other sources*. The information shall be given in sufficient time for the aircraft to make proper use of it, and the hazards shall be identified as distinctly as possible.

**Note.— “Other sources” include NOTAM, ATIS broadcasts, and the display of suitable signals.*

7.5.4 When a not previously notified condition pertaining to the safe use by aircraft of the manoeuvring area is reported to or observed by the controller, the appropriate aerodrome authority shall be informed and operations on that part of the manoeuvring area terminated until otherwise advised by the appropriate aerodrome authority.

7.6 CONTROL OF AERODROME TRAFFIC

7.6.1 General

7.6.1.1 As the view from the flight deck of an aircraft is normally restricted, the controller shall ensure that instructions and information which require the flight crew to employ visual detection, recognition and observation are phrased in a clear, concise and complete manner.

7.6.2 Designated positions of aircraft in the aerodrome traffic and taxi circuits

7.6.2.1 The following positions of aircraft in the traffic and taxi circuits are the positions where the aircraft normally receive aerodrome control tower clearances (See figure 7-1). Where practicable, all clearances should be issued without waiting for the aircraft to initiate the call.

Position 1. Aircraft initiates call to taxi for departing flight. Runway-in-use information and taxi clearances given.

Position 2. If there is conflicting traffic, the departing aircraft will be held at this position. Engine run-up will, when required, normally be performed here.

Position 3. Take-off clearance is issued here, if not practicable at position 2.

Position 4. Clearance to land is issued here as practicable.

Position 5. Clearance to taxi to apron is issued here.

Position 6. Parking information issued here, if necessary.

Note 1.— Arriving aircraft executing an instrument approach procedure; will normally enter the traffic circuit on final except when visual manoeuvring to the landing runway is required.

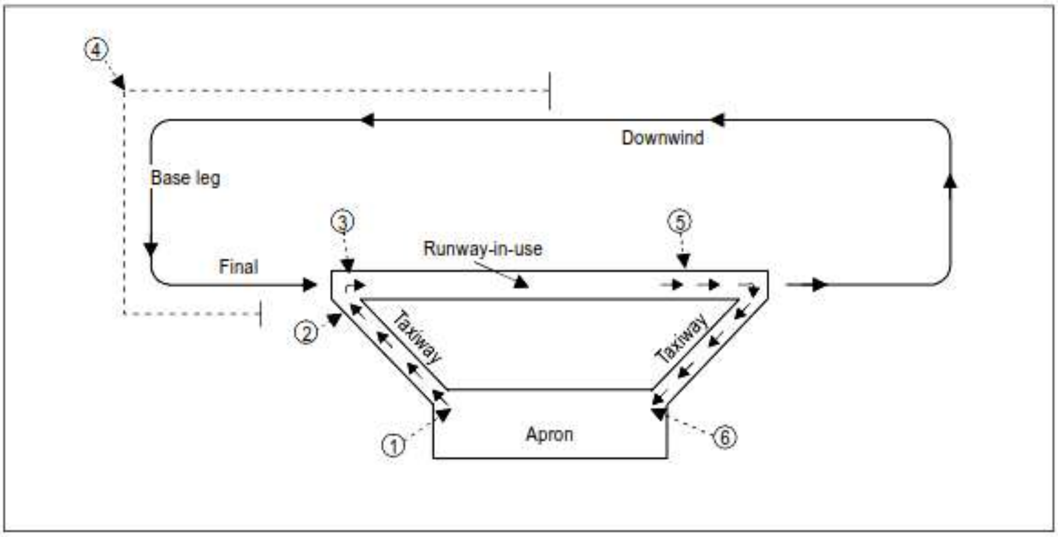


Figure 7-1: Designated positions of aircraft from an aerodrome control tower viewpoint

7.6.3 Traffic on the manoeuvring area

7.6.3.1 Control of Taxiing Aircraft

7.6.3.1.1 *Taxi Clearance*

a) Prior to issuing a taxi clearance, the controller shall determine where the aircraft concerned is parked. Taxi clearances shall contain concise instructions and adequate information so as to assist the flight crew to follow the correct taxi routes, to avoid collision with other aircraft or objects and to minimize the potential for the aircraft inadvertently entering an active runway.

b) When a taxi clearance contains a taxi limit beyond a runway, it shall contain an explicit clearance to cross or an instruction to hold short of that runway.

7.6.3.1.2 **Taxiing on a Runway-In-Use**

a) For the purpose of expediting air traffic, aircraft may be permitted to taxi on the runway-in-use, provided no delay or risk to other aircraft will result. Where control of taxiing aircraft is provided by a ground controller and the control of runway operations by an aerodrome controller, the use of a runway by taxiing aircraft shall be coordinated with and approved by the aerodrome controller. Communication with the aircraft concerned should be transferred from the ground controller to the aerodrome controller prior to the aircraft entering the runway.

b) If the control tower is unable to determine, either visually or via an ATS surveillance system that a vacating or crossing aircraft has cleared the runway, the aircraft shall be requested to report when it has vacated the runway. The report shall be made when the entire aircraft is beyond the relevant runway-holding position.

7.6.3.1.3 **Use of Runway-Holding Positions**

a) Except as provided in b) below, aircraft shall not be held closer to a runway-in-use than at a runway-holding position.

b) Aircraft shall not be permitted to line up and hold on the approach end of a runway-in-use whenever another aircraft is effecting a landing, until the landing aircraft has passed the point of intended holding. See Figure 7-2.

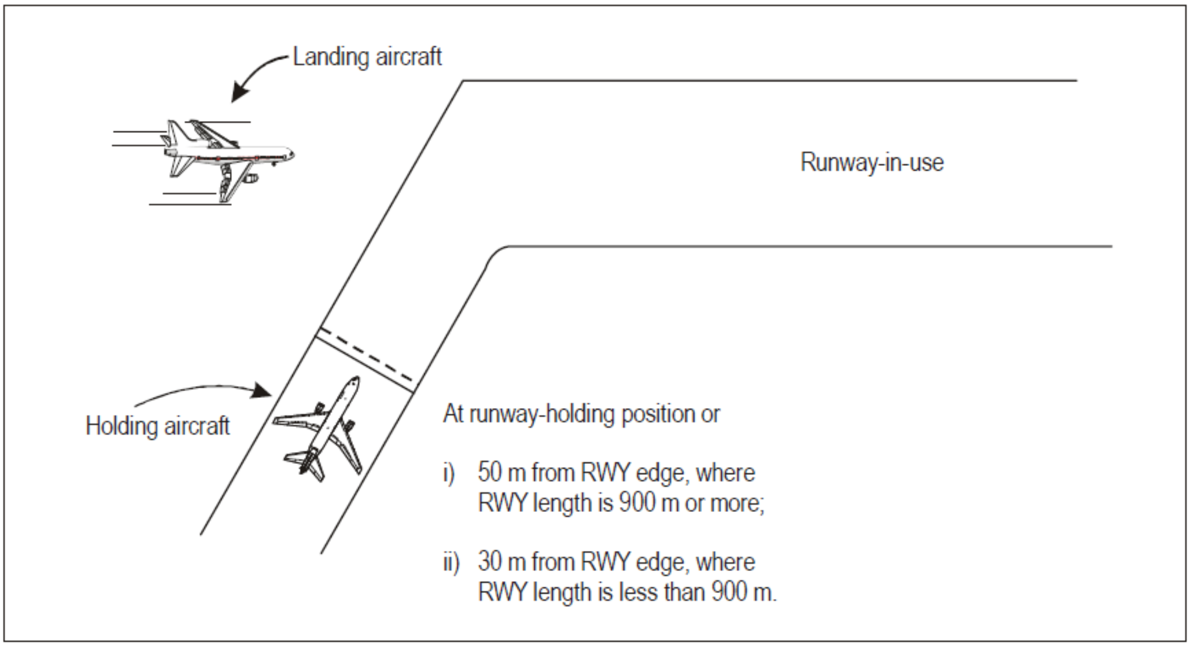


Figure 7-2: Method of holding aircraft [See 7.6.3.1.3 b)]

7.6.3.1.4 Crossing of runways and taxiways

7.6.3.1.4.1 Safety of aircraft operations is likely to be jeopardized by the unauthorized movement of vehicular traffic and personnel across runways and taxi-ways. Vehicles should follow perimeter / service road wherever available and avoid crossing runways and taxiways.

7.6.3.1.4.2 In order to ensure that safety of aircraft operations is not jeopardized, crossing of runways and taxi-ways will not be permitted without specific clearance from the Aerodrome Control Tower / Surface movement control (SMC).

7.6.3.1.4.3 Permission should be sought from Aerodrome Control Tower / SMC either on phone or on appropriate VHF / RTF or walkie-talkie sets before entering runways or taxi-ways.

7.6.3.1.4.4 All Airline operator and other concerned organizations should be instructed to comply with these instructions to avoid any untoward incident and to maintain safe aircraft operations.

7.6.3.1.5 Helicopter Taxiing Operations

7.6.3.1.5.1 When necessary for a wheeled helicopter or vertical take-off and landing (VTOL) aircraft to taxi on the surface, the following provisions are applicable.

Note.— Ground taxiing uses less fuel than air-taxiing and minimizes air turbulence. However, under certain conditions, such as rough, soft or uneven terrain, it may become necessary to air-taxi for safety considerations. Helicopters with articulating rotors (usually designs with three or more main rotor blades) are subject to "ground resonance" and may, on rare occasions, suddenly lift off the ground to avoid severe damage or destruction.

7.6.3.1.5.2 When it is requested or necessary for a helicopter to proceed at a slow speed above the surface, normally below 20 kt and in ground effect, air taxiing may be authorized.

Note.— Air-taxiing consumes fuel at a high burn rate, and helicopter downwash turbulence (produced in ground effect) increases significantly with larger and heavier helicopters.

7.6.3.1.5.3 Instructions which require small aircraft or helicopters to taxi in close proximity to taxiing helicopters should be avoided and consideration should be given to the effect of turbulence from taxiing helicopters on arriving and departing light aircraft.

7.6.3.1.5.4 A frequency change should not be issued to single-pilot helicopters hovering or air-taxiing. Whenever possible, control instructions from the next ATS unit should be relayed as necessary until the pilot is able to change frequency.

Note.— Most light helicopters are flown by one pilot and require the constant use of both hands and feet to maintain control during low-altitude/low-level flight. Although flight control friction devices assist the pilot, changing frequency near the ground could result in inadvertent ground contact and consequent loss of control.

7.6.3.2 Control of other than aircraft traffic

7.6.3.2.1 Entry to the Manoeuvring Area

7.6.3.2.1.1 The movement of pedestrians 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. Persons, including drivers of all vehicles, shall be required to obtain authorization from the aerodrome control tower before entry to the manoeuvring area. Notwithstanding such an authorization, entry to a runway or runway strip or change in the operation authorized shall be subject to a further specific authorization by the aerodrome control tower.

7.6.3.2.1.2 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 sensitive area(s) when Category II or Category III A / B precision instrument operations are in progress;

b) Subject to the provisions in 7.6.3.2.1.1, the vehicles shall remain at safe distance from taxiing aircraft.

7.6.3.2.2 Priority on the Manoeuvring Area

7.6.3.2.2.1 Emergency vehicles proceeding to the assistance of an aircraft in distress shall be afforded priority over all other surface movement traffic. All movement of surface traffic should, to the extent practicable, be halted until it is determined that the progress of the emergency vehicles will not be impeded.

7.6.3.2.2.2 Subject to the provisions in 7.6.3.2.2.1, vehicles on the manoeuvring area shall be required to comply with the following rules:

a) vehicles, vehicles towing aircraft and pedestrians 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.

7.6.3.2.2.3 When an aircraft is landing or taking off, vehicles shall not be permitted to hold closer to the runway-in use than:

a) **at a taxiway/runway intersection**- at a runway holding position; and

b) **at a location other than a taxiway/runway intersection**- at a distance equal to the separation distance of the runway-holding position. (See Figure 7-2)

7.6.3.2.3 Communication Requirements and Visual Signals

7.6.3.2.3.1 At controlled aerodrome all vehicles employed on the manoeuvring area shall be capable of maintaining two-way radio communication with the aerodrome control tower, except when the vehicle is occasionally used on the manoeuvring area and is:

a) accompanied by a vehicle with the required communications capability, or

b) employed in accordance with a pre-arranged plan established with the aerodrome control tower.

7.6.3.2.3.2 When communications by a system of visual signals is deemed to be adequate, or in the case of radio communication failure, the signals given hereunder shall have the meaning indicated therein:

Light signal from aerodrome control	**Meaning**
Green flashes	Permission to cross landing area or to move onto taxiway
Steady red	Stop
Red flashes	Move off the landing area or taxiway and watch out for aircraft
White flashes	Vacate manoeuvring area in accordance with local instructions

Table: 7-1: Light Signals from Aerodrome Control Tower to aircraft on manoeuvring area

7.6.3.2.3.3 In emergency conditions or if the signals in 7.6.3.2.2.2 are not observed, the signal given hereunder shall be used for runways or taxiways equipped with a lighting system and shall have the meaning indicated therein

Light signal	**Meaning**
Flashing runway or taxiway lights	Vacate the runway and observe the tower for light signal

Table: 7-2: Light Signals using Runway/taxiway lighting system, from Aerodrome Control Tower to aircraft on manoeuvring area

7.6.3.2.3.4 When employed in accordance with a plan pre-arranged with the aerodrome control tower, constructional and maintenance personnel should not normally be required to be capable of maintaining two-way radio communication with the aerodrome control tower.

7.6.3.3 Runway Occupancy

7.6.3.3.1 When aircraft, persons or vehicles have been given permission to cross or occupy a runway in use, the controller shall, as a positive reminder that the runway is blocked, display a strip(s) or marker(s) on the part of the flight progress board which is used to represent the runway.

7.6.3.3.2 At units where flight progress boards are not used, such runway occupancy is to be shown effectively by a suitable method similar to the above.

7.7 CONTROL OF TRAFFIC IN THE TRAFFIC CIRCUIT

7.7.1 General

7.7.1.1 Aircraft in the traffic circuit shall be controlled to provide the separation minima outlined in 7.9.2, 7.10.1 and Chapter 5, Section 5.9, except that:

a) aircraft in formation are exempted from the separation minima with respect to separation from other aircraft of the same flight;

b) aircraft operating in different areas or different runways on aerodromes suitable for simultaneous landings or take-offs are exempted from the separation minima;

c) separation minima shall not apply to aircraft operating under military necessity.

7.7.1.2 Sufficient separation shall be effected between aircraft in flight in the traffic circuit to allow the spacing of arriving and departing aircraft as outlined in 7.9.2, 7.10.1 and Chapter 5, Section 5.9.

7.7.2 Entry of traffic circuit

7.7.2.1 The clearance to enter the traffic circuit should be issued to an aircraft whenever it is desired that the aircraft approach the landing area in accordance with current traffic circuits but traffic conditions do not yet allow a landing clearance to be issued. Depending on the circumstances and traffic conditions, an aircraft may be cleared to join at any position in the traffic circuit.

7.7.2.2 An arriving aircraft executing an instrument approach shall normally be cleared to land straight in unless visual manoeuvring to the landing runway is required.

7.7.3 Priority for landing

7.7.3.1 If an aircraft enters an aerodrome traffic circuit without proper authorization, it shall be permitted to land if its actions indicate that it so desires. If circumstances warrant, aircraft which are in contact with the controller may be instructed by the controller to give way so as to remove as soon as possible the hazard introduced by such unauthorized operation. In no case shall permission to land be withheld indefinitely.

7.7.3.2 In cases of emergency it may be necessary, in the interests of safety, for an aircraft to enter a traffic circuit and effect a landing without proper authorization. Controllers should recognize the possibilities of emergency action and render all assistance possible.

7.7.3.3 Priority shall be given to:

a) an aircraft which anticipates being compelled to land because of factors affecting the safe operation of the aircraft (engine failure, shortage of fuel, etc.);

b) hospital aircraft or aircraft carrying any sick or seriously injured persons requiring urgent medical attention;

c) aircraft engaged in search and rescue operations;

d) VVIP aircraft - VIP I (President), VIP II (Vice President), VIP III (Prime Minister) and VIP V (Foreign Heads of State/Govt.) aircraft.

7.8 ORDER OF PRIORITY FOR ARRIVING AND DEPARTING AIRCRAFT

7.8.1 An aircraft landing or in the final stages of an approach to land shall normally have priority over an aircraft intending to depart from the same or an intersecting runway.

7.9 CONTROL OF DEPARTING AIRCRAFT

7.9.1 Departure sequence

7.9.1.1 Time taken for startup or pushback/start-up and taxiing time from various parking areas differ greatly; therefore, departure sequence shall not be determined on start-up request time.

7.9.1.2 Departures shall normally be cleared in the order in which they are ready for take-off, except that deviations may be made from this order of priority to facilitate the maximum number of departures with the least average delay. Factors which should be considered in relation to the departure sequence include, *inter alia*:

a) types of aircraft and their relative performance;

b) routes to be followed after take-off;

c) any specified minimum departure interval between take-offs;

d) need to apply wake turbulence separation minima;

e) aircraft which should be afforded priority; and

f) aircraft subject to ATFM requirements.

7.9.1.3 The Aerodrome Control Tower/SMC would approve start-up of aircraft on request and the sequence of departure would be determined and intimated based on their taxiing sequence / sequence at holding point, except where a deviation is made to facilitate a VIP aircraft or change of order is resorted to for traffic reasons.

7.9.1.4 However, the sequence of any two or more aircraft proceeding on the same route or restricted by push-back on adjacent bays would be determined based on their request for start-up.

7.9.1.5 At times cruising level availability may be affected by an overflying aircraft at the same level. Or, more than one aircraft scheduled to proceed to the same destination may register 'Start-up requests' while actually not being ready. Such approvals may be suffixed with approval expiry time (say, 5 minutes) to ensure that only aircraft genuinely ready for push-back / start-up calls up ATC / SMC for 'push-back / start-up'.

7.9.1.6 Aircraft should be informed of any delay in approving push-back / start-up and reason thereof.

7.9.1.7 *Start-up procedures for aircraft on domestic sector*

7.9.1.7.1 Push-back / Start-up at domestic sector should not be withheld for reasons of ATC coordination. ATC should respond as "START-UP OR PUSH-BACK APPROVED, STANDBY FOR LEVEL CLEARANCE".

7.9.1.8 *Start-up procedures for international (long haul) flights*

7.9.1.8.1 Since long haul international flights are fuel critical due higher fuel consumption at lower levels and they will prefer to know available flight level before push-back, ATC should respond "standby for level" to a push-back / start-up request.

7.9.1.8.2 Following coordination for level clearance / ATC clearance, aircraft shall be informed immediately and push-back / start-up approved.

7.9.1.8.3 Standard phraseologies for start-up, taxiing and Surface Movement as contained in chapter 12 must be adhered to.

7.9.2 Separation of departing aircraft

7.9.2.1 Except as provided in Chapter 5 section 5.9, a departing aircraft will not normally be permitted to commence take-off until the preceding departing aircraft has crossed the end of the runway-in-use or has started a turn or until all preceding landing aircraft are clear of the runway-in-use. (see Figure 7-3)

Position limits to be reached by a landed aircraft (A) or a departing aircraft (B or C) before an arriving aircraft may be cleared to cross the threshold of the runway-in-use or a departing aircraft may be cleared to take-off, unless otherwise prescribed in MATS-2.

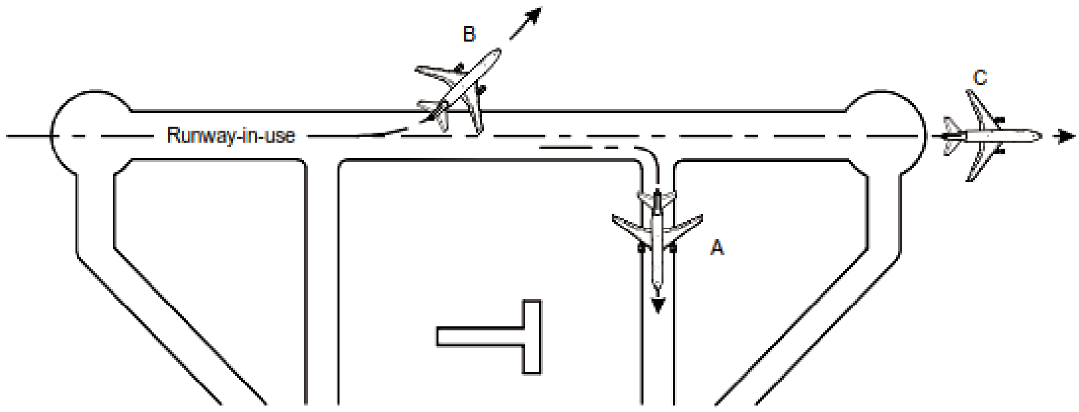


Figure 7-3: Separation between departing and arriving aircraft (see 7.9.2 and 7.10.1)

7.9.3 Take-off clearance

7.9.3.1 Take-off clearance may be issued to an aircraft when there is reasonable assurance that the separation in 7.9.2, will exist when the aircraft commences take-off.

7.9.3.2 When an ATC clearance is required prior to take-off, the take-off clearance shall not be issued until the ATC clearance has been transmitted to and acknowledged by the aircraft concerned. The ATC clearance shall be forwarded to the aerodrome control tower with the least possible delay after receipt of a request made by the tower or prior to such request if practicable.

7.9.3.3 The expression TAKE-OFF shall only be used in radiotelephony when an aircraft is cleared for take-off or when cancelling a take-off clearance.

Note. — The expression TORA, pronounced TOR-AH, may be used to indicate take-off run available.

7.9.3. 4 Subject to 7.9.3.2, the take-off clearance shall be issued when the aircraft is ready for take-off and at or approaching the departure runway, and the traffic situation permits. To reduce the potential for misunderstanding, the take-off clearance shall include the designator of the departure runway.

7.9.3.5 In the interest of expediting traffic, a clearance for immediate take-off may be issued to an aircraft before it enters the runway. On acceptance of such clearance the aircraft shall taxi out to the runway and take off in one continuous movement.

7.10 CONTROL OF ARRIVING AIRCRAFT

7.10.1 Separation of landing aircraft and preceding landing and departing aircraft using the same runway

7.10.1.1 Except as provided in Chapter 5 section 5.9, a landing aircraft will not normally be permitted to cross the runway threshold on its final approach until the preceding departing aircraft has crossed the end of the runway-in-use, or has started a turn, or until all preceding landing aircraft are clear of the runway-in-use. (See figure 7-3)

7.10.2 Clearance to land

7.10.2.1 An aircraft may be cleared to land when there is reasonable assurance that the separation in 7.10.1, will exist when the aircraft crosses the runway threshold, provided that a clearance to land shall not be issued until a preceding landing aircraft has crossed the runway threshold. To reduce the potential for misunderstanding, the landing clearance shall include the designator of the landing runway.

7.10.3 Landing and roll-out manoeuvres

7.10.3.1 When necessary or desirable in order to expedite traffic, a landing aircraft may be requested to:

a) hold short of an intersecting runway after landing;

b) land beyond the touchdown zone of the runway;

c) vacate the runway at a specified exit taxiway;

d) expedite vacating the runway.

7.10.3.2 In requesting a landing aircraft to perform a specific landing and/or roll-out manoeuvre, the type of aircraft, runway length, location of exit taxiways, reported braking action on runway and taxiway, and prevailing meteorological conditions shall be considered. A HEAVY aircraft shall not be requested to land beyond the touchdown zone of a runway.

7.10.3.3 If the pilot-in-command considers that he or she is unable to comply with the requested operation, the controller shall be advised without delay.

7.10.3.4 When necessary or desirable, e.g. due to low visibility conditions, a landing or a taxiing aircraft may be instructed to report when a runway has been vacated. The report shall be made when the entire aircraft is beyond the relevant runway- holding position.

7.10.3.5 Except for reasons of safety, no transmission shall be directed to the aircraft during the last part of the final approach or during the landing roll.

7.10.3.6 Unless absolutely necessary, controllers should not direct taxi instructions to aircraft until the landing roll is completed.

7.10.4 Radio calls during missed approach/go around phase

7.10.4.1 A missed-approach or go-around procedure is carried out by an aircraft when the approach cannot be continued or when instructed by ATC. There could be many reasons of initiating a missed approach by pilot such as unstablised approach, wind shear, strong tail wind, bad weather, bird activity in approach path or on runway, FOD on runway, degradation/ unserviceability of landing aid, malfunctioning of avionics, non-establishment of required visual reference etc.

7.10.4.2 The flight crew are expected to inform ATC of initiation and reason of the missed approach/go around as soon as possible but occasionally they do not inform reason to ATC. Such information e.g. bird activity on runway, may be very significant information for subsequent arriving aircraft. However, when a missed-approach is initiated, cockpit workload is inevitably high, asking reason for go around by ATC may distract the flight crew.

7.10.4.3 When Flight crew of an aircraft initiates missed approach/go around, generally they notify to the ATC immediately with reason of such manoeuvre. The flight crew is expected to follow published missed approach procedures. However, situations wherein an immediate alternate missed approach/go around instruction need to be passed due safety reasons e.g. conflicting traffic, then such instruction/clearance shall be short and simple to comprehend.

7.10.4.4 If flight crew has previously not intimated the reason for missed approach approach/ go around, then air traffic controllers should normally not ask the reason of missed approach / go around during initial stages of missed approaches unless immediate safety reason demands so. Subsequently the air traffic controller may request the flight crew to advise the reason of missed approach / go around using following phraseology:

WHEN ABLE, ADVISE REASON OF GO AROUND.

7.11 PROCEDURES FOR LOW VISIBILITY OPERATIONS

7.11.1 Control of aerodrome surface traffic in conditions of low visibility

7.11.1.1 In conditions where low visibility procedures are in operation, 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 sensitive area(s) when Category II or Category III A/B precision instrument operations are in progress.

7.11.1.2 When there is a requirement for traffic to operate on the manoeuvring area in conditions of visibility which prevent the aerodrome control tower from applying visual separation between aircraft, and between aircraft and vehicles, the following shall apply:

7.11.1.2.1 At the intersection of taxiways, an aircraft or vehicle on a taxiway shall not be permitted to hold closer to the other taxiway than the holding position limit defined by a clearance bar, stop bar or taxiway intersection marking.

7.11.1.2.2 Subject to the provisions in 7.11.1.2.1, the vehicles shall remain at safe distance from taxiing aircraft.

7.12 SUSPENSION OF VISUAL FLIGHT RULES OPERATIONS

7.12.1 Any or all VFR operations on and in the vicinity of an aerodrome may be suspended by any of the following units, persons or authorities whenever safety requires such action:

a) the approach control unit or the appropriate ACC;

b) the aerodrome control tower;

7.12.2 All such suspensions of VFR operations shall be accomplished through or notified to the aerodrome control tower.

7.12.3 The following procedures shall be observed by the aerodrome control tower whenever VFR operations are suspended:

a) hold all VFR departures;

b) recall all local flights operating under VFR or obtain approval for special VFR operations;

c) notify the approach control unit or ACC as appropriate of the action taken;

d) notify all operators, or their designated representatives, of the reason for taking such action, if necessary or requested.

7.13 AUTHORIZATION OF SPECIAL VFR FLIGHTS

7.13.1 When traffic conditions permit, special VFR flights may be authorized subject to the approval of the unit providing approach control service and the following provisions:

a) Requests for such authorization shall be handled individually.

b) Separation shall be effected between all special VFR flights and between such flights and IFR flights in accordance with separation minima applicable to IFR flights.

c) When the ground visibility is not less than 1500 m, special VFR flights may be authorized to: enter a control zone for the purpose of landing, take off and depart from a control zone, cross a control zone or operate locally within a control zone. Performance Class I, Performance Class II and military helicopters may be authorized to operate special VFR flights when the ground visibility is not less than 1000 meters.

7.13.2 **Performance class 1 helicopter:** A helicopter with performance such that, in case of critical power- unit failure, it is able to land on the rejected take-off area or safely continue the flight to an appropriate landing area depending on when the failure occurs.

7.13.3 **Performance class 2 helicopter:** A helicopter with performance such that, in case of critical power-unit failure, it is able to safety continue the flight, except when the failure occurs prior to a defined point after take-off or after a defined point before landing, in which cases a forced landing may be required.

7.14 AERONAUTICAL GROUND LIGHTS.

7.14.1 General

7.14.1.1 All aeronautical ground lights shall be operated except as provided in 7.14.1.2 and 7.14.2

a) during the time from sunset to sun rise;
b) during time from sunrise to sunset when visibility is less than 5 km;
c) when requested by pilot;
d) at any other time when their use, based on meteorological conditions, is considered desirable for the safety of air traffic.

7.14.1.2 Lights on and in the vicinity of aerodromes that are not intended for en-route navigation purposes may be turned off, subject to further provisions hereafter, if no likelihood of either regular or emergency operation exists, provided that they can be again brought into operation at least one hour before the expected arrival of an aircraft.

7.14.1.3 At aerodromes equipped with lights of variable intensity a table of intensity settings, based on conditions of visibility and ambient light, should be provided for the guidance of air traffic controllers in effecting adjustment of these lights to suit the prevailing conditions. When so requested by an aircraft, further adjustment of the intensity shall be made whenever possible.

7.14.2 Approach lighting

Note.— Approach lighting includes such lights as simple approach lighting systems, precision approach lighting systems, visual approach slope indicator systems, circling guidance lights, approach light beacons and runway alignment indicators.

7.14.2.1 In addition to 7.14.1.1 approach lighting shall also be operated:

a) by day when requested by an approaching aircraft;
b) when the associated runway lighting is operated;

7.14.2.2 The lights of a visual approach slope indicator system shall be operated during the hours of daylight as well as of darkness and irrespective of the visibility conditions when the associated runway is being used.

7.14.3 Runway lighting

Note.— Runway lighting includes such lights as edge, threshold, centre line, end, touchdown zone and wing bar lights.

7.14.3.1 Runway lighting shall not be operated if that runway is not in use for landing, take-off or taxiing purposes, unless required for runway inspections or maintenance.

7.14.3.2 If runway lighting is not operated continuously, lighting following a take-off shall be provided as specified below:

a) at aerodromes where air traffic control service is provided and where lights are centrally controlled, the lights of one runway shall remain lighted after take-off as long as is considered necessary for the return of the aircraft due to an emergency occurring during or immediately after take-off;

b) at aerodromes without air traffic control service or without centrally controlled lights, the lights of one runway shall remain lighted until such time as would normally be required to reactivate the lights in the likelihood of the departing aircraft returning for an emergency landing, and in any case not less than fifteen minutes after take-off.

Note: Operations of Runway centre line lights and touchdown zone lights shall be decided locally, based on the necessary conditions stipulated in DGCA CAR Section 4 Series B Part I on "Aerodrome Design and Operations", DGCA CAR Section 8 Series C Part I on "All Weather Operations (AWO)" or when requested by a pilot and same shall be documented in MATS-Part2.

7.14.4 Stopway lighting

7.14.4.1 Stopway lights shall be operated whenever the associated runway lights are operated.

7.14.5 Taxiway lighting

Note.— Taxiway lighting includes such lights as edge lights, centre line lights, stop bars and clearance bars.

7.14.5.1 Where required to provide taxi guidance, taxiway lighting shall be turned on in such order that a continuous indication of the taxi path is presented to taxiing aircraft. Taxiway lighting or any portion thereof may be turned off when no longer needed.

Note: Operations of Taxiway centre line lights shall be decided locally, based on the necessary conditions stipulated in DGCA CAR Section 4 Series B Part I on "Aerodrome Design and Operations", DGCA CAR Section I Series C Part I on "All Weather Operations (AWO)" or when requested by a pilot and same shall be documented in MATS- Part 2.

7.14.6 Stop bars

7.14.6.1 Stop bars shall be switched on to indicate that all traffic shall stop and switched off to indicate that traffic may proceed.

Note.— Stop bars are located across taxiways at the point where it is desired that traffic stop, and consist of lights, showing red, spaced across the taxiway.

7.14.7 Obstacle lighting

7.14.7.1 Obstacle lighting associated with the approach to or departure from a runway or channel, where the obstacle does not project through the inner horizontal surface should be turned off and on simultaneously with the runway lights.

7.14.7.2 Un -serviceability lights may not be turned off as permitted under 7.14.1.2 while the aerodrome is open.

7.14.8 Monitoring of visual aids

7.14.8.1 Aerodrome controllers shall make use of automatic monitoring facilities, when provided, to ascertain whether the lighting is in good order and functioning according to selection.

7.14.8.2 In the absence of an automatic monitoring system or to supplement such a system, the aerodrome controller shall visually observe such lighting as can be seen from the aerodrome control tower and use information from other sources such as visual inspections or reports from aircraft to maintain awareness of the operational status of the visual aids.

7.14.8.3 On receipt of information indicating a lighting fault, the aerodrome controller shall take such action as is warranted to safeguard any affected aircraft or vehicles, and initiate action to have the fault rectified.

7.15 WIND SHEAR ADVISORIES

Note: Wind shear is a sustained change in the wind velocity along the aircraft flight path, which occurs significantly faster than the aircraft can accelerate or decelerate. It can occur at any level, but it is 'low level wind shear', occurring from the surface to a height of approximately 1500 feet, which can cause problems of sufficient magnitude to affect the control of aircraft in departure or final approach phases of flight.

7.15.1 Whenever a pilot reports wind shear conditions to ATC, the information shall be passed to subsequent arriving and departing aircraft until either confirmation is received that the condition no longer exists or wind shear information has been included in ATIS and flight crew of the concerned aircraft reports the receipt of the appropriate ATIS designator.

Phraseology:

WIND SHEAR WARNING ARRIVING (or DEPARTING) (type of aircraft) REPORTED LIGHT (or MEDIUM or HEAVY) WIND SHEAR

7.15.2 Reports on wind shear from aircraft should be passed to Meteorological office.

7.16 Runway surface condition (including Aquaplaning/Hydroplaning) Reporting.

Note 1: *Aquaplaning also known as hydroplaning is a condition in which standing water causes the moving wheel of an aircraft to loose contact with the surface on which it is load bearing with the result that braking action on the wheel is not effective in reducing the ground speed of the aircraft. Aquaplaning can occur when a wheel is running in the presence of water; it may occur in certain circumstances when running in a combination of water and wet snow.*

Note 2: *Runway excursion is a veer off or overrun off the runway surface*

7.16.1 The aerodrome operator is responsible for assessing runway surface conditions.

7.16.2 Information that water is present on a runway shall be transmitted to each aircraft concerned on, on the initiative of the controller, using the terms in Table 7-3:

7.16.3 Reports from pilots may be transmitted by a controller when it is felt that the information may prove useful to other aircraft.

Phraseology:

BRAKING ACTION REPORTED BY (aircraft type) AT (time) GOOD (or MEDIUM to GOOD, or MEDIUM, or MEDIUM to POOR, or POOR)

DAMP	The surface shows a change of colour due to moisture.
WET	The surface is soaked but there is no standing water.
STANDING WATER	For aeroplane performance purposes, a runway where more than 25 per cent of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by water more than 3 mm deep

Table 7-3: Terms used to indicate presence of water on runway

7.16.4 When flight crew of an aircraft reports aquaplaning/hydroplaning, the controller shall inform succeeding aircraft.

Phraseology:

AQUAPLANING REPORTED BY (aircraft type) AT (time)

7.17 DESIGNATION OF HOT SPOT

7.17.1 The aerodrome operator shall whenever necessary, designate a location or several locations on the movement area of the aerodrome as hot spot(s). Such hot spots, when notified by aerodrome operator shall be included in MATS- Part 2.

Note.- Guidance material related to hot spot is contained in the Manual on the Prevention of Runway Incursions (Doc 9870).

7.18 PREVENTION OF SAFETY OCCURRENCES DURING RUNWAY INSPECTION

7.18.1 Runway inspection is carried out for various purposes viz. runway inspection, inspection of runway lights, clearing/cleaning runway of any FOD or bird control etc.

7.18.2 The vehicle intending to enter runway shall obtain positive clearance from the Aerodrome Control Tower and remain in RT contact with the Aerodrome Control Tower.

7.18.3 Visual surveillance, as far as practicable, shall be maintained by tower controllers on the runway and the vehicle carrying out the runway inspection.

7.18.4 The control tower shall obtain runway status and explicit runway vacation report from the concerned vehicle before allowing any aircraft operation on that runway. If the runway inspection report by the vehicle does not include explicit runway status and/or vacation report, query in the following phraseology can be made to ascertain runway status and runway vacation.

"CONFIRM RUNWAY FIT FOR OPERATIONS" and/or "CONFIRM RUNWAY [number] VACATED".

7.18.5 Assumption shall never be made on the vacation of the runway by the vehicle merely on the basis of visual observation by the controller as there always exists a possibility of the vehicle going off and on the runway for various reasons such as; chasing dogs, animals or birds, inspection of the intersecting taxiways and inspection of the edge lights etc.

CHAPTER 8

ATS SURVEILLANCE SERVICES

8.1 GENERAL PROVISIONS:

8.1.1 ATS surveillance systems, such as primary surveillance radar (PSR), secondary surveillance radar (SSR), ADS-B and MLAT system may be used either alone or in combination in the provision of air traffic services, including in the provision of separation between aircraft, provided:

a) reliable coverage exists in the area;

b) The probability of detection, the accuracy and the integrity of the ATS surveillance system(s) are satisfactory; and

c) In the case of ADS-B, the availability of data from participating aircraft is adequate,

8.1.2 PSR systems should be used in circumstances where other ATS surveillance systems alone would not meet the air traffic services requirements.

8.1.3 SSR system, especially those utilizing monopulse technique or having Mode S capability, or MLAT may be used alone, including in the provision of separation between aircraft, provided;

a) the carriage of SSR transponders is mandatory within the area; and

b) identification is established and maintained.

8.1.4 ADS-B shall only be used for the provision of air traffic control service provided the quality of the information contained in the ADS-B message exceeds the values as specified in AIP.

8.1.5 ADS-B may be used alone in the provision of separation between aircraft, provided:

a) identification of ADS-B-equipped aircraft is established and maintained;

b) the data integrity measure in the ADS-B message is adequate to support the separation minimum;

c) there is no requirement for detection of aircraft not transmitting ADS-B; and

d) there is no requirement for determination of aircraft position independent of the position-determining elements of the aircraft navigation system

8.1.6 The provision of ATS surveillance services shall be limited when position data quality degrades below a level as specified in AIP/MATS-Part 2.

8.1.7 Where PSR and SSR are required to be used in combination, SSR alone may be used in the event of PSR failure to provide separation between identified transponder-equipped aircraft, provided the accuracy of the SSR position indications has been verified by monitor equipment or other means.

8.1.8 The number of aircraft simultaneously provided with ATS surveillance services shall not exceed that which can safely be handled under the prevailing circumstances, taking into account:

a) the structural complexity of the control area or sector concerned;

b) the functions to be performed within the control area or sector concerned;

c) assessments of controller workloads, taking into account different aircraft capabilities, and sector capacity; and

d) the degree of technical reliability and availability of the primary and back-up communications, navigation and surveillance systems, both in the aircraft and on the ground.

8.1.9 Direct pilot-controller communications shall be established prior to the provision of ATS surveillance services, unless special circumstances, such as emergencies, dictate otherwise.

8.2 USE OF ATS SURVEILLANCE SYSTEM IN AIR TRAFFIC CONTROL SERVICE:

8.2.1 The information provided by ATS surveillance systems and presented on a situation display may be used to perform the following functions in the provision of air traffic control service;

8.2.1.1 Provide ATS surveillance services in order to:-

a) improve airspace utilization;

b) reduce delays;

c) facilitate direct routings and more optimum flight profiles;

d) enhance safety

8.2.1.2 Provide vectoring to:-

a) Departing aircraft for expeditious and efficient departure flow and expediting climb to cruising level

b) Arriving aircraft for the purpose of expediting descent from cruising level and establishing an expeditious and efficient approach sequence.

c) Aircraft for purpose of resolving potential conflict.

d) Assist pilots in their navigation.

8.2.1.3 Provide separation and maintain normal traffic flow when an aircraft experiences communication failure within area of coverage.

8.2.1.4 Maintain flight path monitoring of air traffic

8.2.1.5 Maintain a watch on the progress of air traffic, in order to provide a procedural controller with:

a) improved position information regarding aircraft under control.

b) supplementary information regarding other traffic.

c) Information regarding any significant deviations by aircraft from their assigned routing or level, when appropriate.

NOTE: *To be considered 'Significant' an aircraft's track deviation should be sufficient to take it beyond the boundary of the route being followed or be assessed by the controller as liable to take it beyond the edge of the protected airspace of the route being followed.*

8.2.2 The position indication presented on a situation display may be used to perform the following additional functions in the provision of approach control service:

a) provide vectoring of arriving traffic on to pilot-interpreted final approach aids;

b) provide vectoring of arriving traffic to a point from which a visual approach can be completed;

c) provide vectoring of arriving traffic to a point from which a surveillance radar approach can be made;

d) provide flight path monitoring of other pilot-interpreted approaches;

e) in accordance with prescribed procedures, conduct surveillance radar approaches;

f) provide separation between:

i) succeeding departing aircraft;

ii) succeeding arriving aircraft; and

iii) a departing aircraft and a succeeding arriving aircraft.

8.3 USE OF SSR TRANSPONDERS AND ADS-B TRANSMITTERS

8.3.1 To ensure the safe and efficient use of ATS surveillance services pilots and controllers shall strictly adhere to published operating procedures and standard radiotelephony phraseology shall be used. The correct setting of transponder codes and/or aircraft identification shall be ensured at all times.

8.3.2 **SSR CODE MANAGEMENT**

8.3.2.1 *General Principles to meet the objectives:* The detailed principles governing the use of SSR codes in the APAC Region are based on the following general principles:

a) Mode A codes should be used for ATS purposes only.

b) Code assignment practices should be based on the temporary use of codes and permit the most economic code re-cycling. The need for code changes during flight should be minimum and may be resorted to only when essential for the operations of the ATC system/unit having control responsibility.

c) Codes are allotted on the basis of duly justified operational requirements, with the actual number derived from the number of aircraft to be handled simultaneously within a specified area and for a determined period of protection (uniqueness) during traffic peaks.

d) Codes should be assigned to aircraft as close as possible to their actual departure time, and preferably at the time they receive their start-up clearance. In the case of having to change the code of an aircraft while in flight, the assignment should be made as close as possible to the time the flight is to transfer to the control of the assigning ATS unit/system

e) Codes may be assigned according to the earliest time of release. However, in units assigning codes manually, the cyclical assignment of the codes released should be undertaken instead of an allocation.

8.3.3 Special Purpose Codes:

8.3.3.1 Specific codes in certain series are reserved for special purposes as follows:

SSR Codes	Purpose
0000	Available as a general-purpose code for domestic use by any State.
2000	Reserved for use on the initiative of pilots to provide recognition of aircraft which have not received ATC instructions regarding which code to squawk.
7500	Reserved for use in the event of unlawful interference.
7600	Reserved for use in the event of radiotelephony communication failure
7700	Reserved for use in the event of emergencies

Table 8-1: Special purpose SSR codes

8.3.4 Emergency Procedure:

8.3.4.1 An aircraft encountering a state of emergency may continue to operate the transponder on the previously assigned code, until otherwise advised. Alternatively the transponder shall be set to mode A code 7700.

8.3.4.2 Notwithstanding the procedure in 8.3.3.1 above, a pilot may select mode A code 7700 whenever the nature of the emergency is such that this appears to be the most suitable course of action.

8.3.5 Radio Communication Failure

8.3.5.1 In the event of an aircraft radio receiver failure, a pilot shall select mode A code 7600 and follow established procedures; subsequent control of the aircraft will be based on those procedures.

8.3.6 Unlawful Interference

8.3.6.1 Should an aircraft in flight be subjected to unlawful interference, the pilot shall endeavor to set the transponder to mode A code 7500 to give indication of the situation unless circumstances warrant the use of mode A code 7700.

8.3.6.2 When a pilot has selected mode A code 7500 and is subsequently requested to confirm his code by ATC he shall, according to circumstances either confirm this or not reply at all.

NOTE: The absence of a reply from the pilot will be taken by ATC as an indication that the use of code 7500 is not due to an inadvertent false code selection.

8.3.7 Operation of SSR transponders:

8.3.7.1 When it is observed that the Mode A code shown on the situation display is different to what has been assigned to the aircraft, the pilot shall be requested to confirm the code selected and, if the situation warrants (e.g. not being a case of unlawful interference), to reselect the correct code.

8.3.7.2 If the discrepancy between assigned and displayed Mode A codes still persists, the pilot may be requested to stop the operation of the aircraft's transponder. The next control position and any other affected unit using SSR and/or MLAT in the provision of ATS shall be informed accordingly.

8.3.7.3 Aircraft equipped with Mode S having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration.

8.3.7.4 Whenever it is observed on the situation display that the aircraft identification transmitted by a Mode S-equipped aircraft is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re-enter the correct aircraft identification.

Phraseology:

RE-ENTER [MODE S] AIRCRAFT IDENTIFICATION.

8.3.7.5 If, following confirmation by the pilot that the correct aircraft identification has been set on the Mode S identification feature, the discrepancy continues to exist, the following actions shall be taken by the controller:

a) inform the pilot of the persistent discrepancy;

b) where possible, correct the label showing the aircraft identification on the situation display; and

c) notify the erroneous aircraft identification transmitted by the aircraft to the next control position and any other interested unit using Mode S for identification purposes.

8.3.8 Operation of ADS-B transmitters

8.3.8.1 To indicate that it is in a state of emergency or to transmit other urgent information, an aircraft equipped with ADS-B might operate the emergency and/or urgency mode as follows:

a) emergency;

b) communication failure;

c) unlawful interference;

d) minimum fuel; and/or

e) medical.

Note: *Some aircraft equipped with first generation ADS-B avionics do not have the capability described above and only have the capability to transmit a general emergency alert regardless of the code selected by the pilot.*

8.3.8.2 Aircraft equipped with ADS-B having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration.

8.3.8.3 Whenever it is observed on the situation display that the aircraft identification transmitted by an ADS-B-equipped aircraft is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re-enter the correct aircraft identification.

Phraseology:

RE-ENTER [ADS-B] AIRCRAFT IDENTIFICATION.

8.3.8.4 If, following confirmation by the pilot that the correct aircraft identification has been set on the ADS-B identification feature, the discrepancy continues to exist, the following actions shall be taken by the controller:

a) inform the pilot of the persistent discrepancy;

b) where possible, correct the label showing the aircraft identification on the situation display; and

c) notify the next control position and any other unit concerned of the erroneous aircraft identification transmitted by the aircraft.

8.3.9 Level Information based on the use of pressure altitude information:

8.3.9.1 Verification of accuracy of level information:

8.3.9.1.1 The tolerance value used to determine that pressure-altitude-derived level information displayed to the controller is accurate shall be ± 200 ft in RVSM airspace. In other airspace, it shall be ±300 ft. Geometric height information shall not be used for separation.

8.3.9.1.2 Verification of pressure-altitude-derived level information displayed to the controller shall be effected at least once by each suitably equipped ATC unit on initial contact with the aircraft concerned or, if this is not feasible, as soon as possible thereafter. The verification shall be effected by simultaneous comparison with altimeter-derived level information received from the same aircraft by radiotelephony. The pilot of the aircraft whose pressure-altitude-derived level information is within the approved tolerance value need not be advised of such verification. Geometric height information shall not be used to determine if altitude differences exist.

Note 1: The accuracy of pressure-altitude-derived level information displayed to the controller may be verified based on the level information report given by aircraft

Note 2: When the accuracy of pressure-altitude-derived level information displayed to the controller has been verified by a controller and inter-unit/Intra-unit handoff is made to another controller at the same location, the accepting controller need not verify the pressure-altitude-derived level information.

8.3.9.1.3 If the displayed level information is not within the approved tolerance value or when a discrepancy in excess of the approved tolerance value is detected subsequent to verification, the pilot shall be advised accordingly and requested to check the pressure setting and confirm the aircraft's level.

Phraseology:

CHECK ALTIMETER SETTING AND CONFIRM (*level*).

8.3.9.1.4 If, following confirmation of the correct pressure setting the discrepancy continues to exist, the following action should be taken according to circumstances:

a) request the pilot to stop Mode C or ADS-B altitude data transmission, provided this does not cause the loss of position and identity information,

Phraseology:

STOP SQUAWK CHARLIE WRONG INDICATION;

STOP ADS-B ALTITUDE TRANSMISSION [(WRONG INDICATION, *reason*)].

and notify the next control positions or ATC unit concerned with the aircraft of the action taken; or

b) inform the pilot of the discrepancy and request that the relevant operation continue in order to prevent loss of position and identity information of the aircraft, and, when authorized by the local ATS In-charge through Circular or publication in MATS-Part 2, override the label-displayed level information with the reported level. Notify the next control position or ATC unit concerned with the aircraft of the action taken.

8.3.9.2 **Determination of level occupancy:**

8.3.9.2.1 The criterion which shall be used to determine that a specific level is occupied by an aircraft shall be ± 200 ft in RVSM airspace. In other airspace, it shall be ±300 ft.

8.3.9.2.2 *Aircraft maintaining a level.* An aircraft is considered to be maintaining its assigned level as long as the pressure-altitude-derived level information indicates that it is within the tolerance of the assigned level as specified in 8.3.8.2.1.

8.3.9.2.3 *Aircraft vacating a level.* An aircraft cleared to leave a level is considered to have commenced its manoeuvre and vacated the previously occupied level when the pressure-altitude-derived level information indicates a change of more than 300 ft in the anticipated direction from its previously assigned level.

8.3.9.2.4 *Aircraft passing a level in climb or descent.* An aircraft in climb or descent is considered to have crossed a level when the pressure-altitude-derived level information indicates that it has passed this level in the required direction by more than 300 ft.

8.3.9.2.5 *Aircraft reaching a level.* An aircraft is considered to have reached the level to which it has been cleared when the elapsed time of three display updates, three sensor updates or 15 seconds, whichever is the greater, has passed since the pressure-altitude-derived level information has indicated that it is within appropriate tolerance of the assigned level as specified in 8.3.8.2.1.

8.3.9.2.6 Intervention by a controller shall only be required if differences in level information between that displayed to the controller and that used for control purposes are in excess of the values stated above.

8.4 SITUATION DISPLAY SETTINGS AND PERFORMANCE CHECKS

8.4.1 The controller shall adjust the situation display(s) and carry out adequate checks on the accuracy thereof, in accordance with the technical instructions contained in Local SOPs/MATS-Part 2.

8.4.2 All relevant maps should be displayed on the screen according to the jurisdiction of airspace. Arrangements should be made for automatic display of relevant maps upon initial logon and subsequent consolidation or bifurcation of sectors.

8.4.3 The setting of display range and centre should be optimized to cover all the required area under the jurisdiction of concerned sector. It may be noted that displaying a larger area much beyond sector boundary may divert the controller's attention to other sector traffic instead of paying undivided attention to own traffic.

8.4.4 All the information presented in an aircraft data label is significant and therefore in order to make it conspicuous, the labels shall be accurately positioned. The label positions should be selected in such a manner that these do not overlap or cross each other, not over the PPS and also not far away from the PPS of the aircraft.

8.4.5 The length of the "Leader Line", a solid line that connects the track symbol with its track label, shall be optimized to facilitate the correct and conspicuous position of the labels. Long length of the leader line may give false sense of position of aircraft to controller which may lead to an unsafe situation.

8.4.6 In order to minimize the unwanted clutter of other non-jurisdiction aircrafts, the limits of the altitude filter shall be set as per the requirements of the sector concerned. The standard altitude filter setting shall be established and published in the form of SOPs.

8.4.7 Modern ATC automation systems have the capability of displaying system generated tracks along with flight plan data. Such tracks are called the extrapolated or synthetic tracks. The display of these tracks helps the working controller in advance planning of traffic situation and also during the failure of Data Processing Systems or LANs. It is, therefore, imperative that such tracks should normally be displayed on the Situation Display.

8.4.8 Occasionally, in absence of relevant flight plan data, the surveillance track remains unassociated and the automation system displays "unassociated tracks" i.e. the tracks which have not been associated with the flight plan data. Some automation systems have option for displaying or non-displaying of these unassociated tracks. In some of the automation systems this functionality is termed as ''Splat function", other systems may have the same functionality with different nomenclature. Since "non-display" of unassociated tracks may cause false perception of traffic situation, therefore, it is imperative that all the tracks including unassociated tracks under the jurisdiction of the concerned sector remain displayed on the Situation Display.

8.4.9 "Visual" as well as "Audio" alerts are generated by the automation systems when some system defined alerts/warning situations are created. In order to protect the purpose of the alerts, it is imperative that the brightness level of the visual alert and volume level of the audio alert should be optimally selected. The level of the audio alert should never be kept minimum or muted. It should also be noted that a high volume level of the audio alert may cause disturbance to the other adjacent units.

8.4.10 The input of AMSS messages in the automation system has made it feasible that Meteorological Data is automatically updated in the system. Therefore, a procedure for update of QNH and its notification to concerned Approach Controller shall be established in MATS- Part 2 and adhered to.

8.4.11 The settings of other important miscellaneous functions of Situation Display such as ILS windows, aircraft lists etc. shall be standardized to establish a uniform way of working, which will improve the overall level of safety.

8.4.12 The controller shall be satisfied that the available functional capabilities of the ATS surveillance system as well as the information presented on the situation display(s) is adequate for the functions to be performed.

8.4.13 The controller shall report, in accordance with local procedures contained in MATS- Part 2, any fault in the equipment, or any incident requiring investigation, or any circumstances which make it difficult or impractical to provide ATS surveillance services.

8.5 IDENTIFICATION OF AIRCRAFT

8.5.1 Before providing ATS surveillance service to an aircraft, identification shall be established and the pilot informed by using the phraseology “IDENTIFIED”. Thereafter, identification shall be maintained until termination of the ATS surveillance service.

8.5.2 If identification is subsequently lost, the pilot shall be informed accordingly and, when applicable, appropriate instructions issued.

8.5.3 Identification shall be established by at least one of the methods specified in 8.5.3.1, 8.5.3.2, 8.5.3.3.

8.5.3.1 ADS-B Identification Procedures

8.5.3.1.1 Where ADS-B is used for identification, aircraft may be identified by one or more of the following procedures:

a) direct recognition of the aircraft identification in an ADS-B label;
b) transfer of ADS-B identification; (refer para 8.7) and
c) observation of compliance with an instruction to TRANSMIT ADS-B IDENT;

Note 1.- Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

Note 2.- In automated system, the “IDENT’ feature may be presented in different ways, e.g. as a flashing of all or part of the position indication and associated label.

8.5.3.2 SSR and/or MLAT Identification Procedures

8.5.3.2.1 Where SSR and/or MLAT is used for identification, aircraft may be identified by one or more of the following procedures:

a) recognition of the aircraft identification in an SSR and/or MLAT label

Note: *The controllers need not confirm SSR code with aircraft provided:*

i. the aircraft has been assigned discrete SSR code,

ii. there is no "Duplication" or "Coasting" indication, and

iii. code/call sign correlation has been achieved successfully,

iv. the track of the Radar Position Symbol (RPS) is consistent with the current flight plan of the aircraft.

b) recognition of an assigned discrete code, the setting of which has been verified, in an SSR and/or MLAT label;

Note: For application of such procedures there should not be any "Duplication" or "Coasting" indication

c) direct recognition of the aircraft identification of a Mode S-equipped aircraft in an SSR and/or MLAT label;

Note: The controller should normally correlate the Aircraft Identification Feature with the aircraft identification entered in the flight plan in ATS Flight Data Processing System or displayed to controllers on flight progress strips. This will help in avoiding any misidentification due to transmission of wrong call sign by Mode S equipped aircraft.

d) by transfer of identification ; (refer para 8.7)

e) observation of compliance with an instruction to set a specific code;

f) observation of compliance with an instruction to squawk IDENT;

Note 1.— In automated radar systems, the "IDENT" feature may be presented in different ways, e.g. as a flashing of all or part of the position indication and associated label.

Note 2.— Garbling of transponder replies may produce "IDENT"-type of indications. Nearly simultaneous "IDENT" transmissions within the same area may give rise to errors in identification.

8.5.3.2.2 When a discrete code has been assigned to an aircraft, a check shall be made at the earliest opportunity to ensure that the code set by the pilot is identical to that assigned for the flight. Only after this check has been made shall the discrete code be used as a basis for identification.

Note**:** *Wherever aerodrome control tower is equipped with Approach Monitor Aid, and it is observed that the Mode A code (discrete) shown on the situation display is same as has* *been assigned to the aircraft, it will be deemed as verified Mode A code. There is no need for further verification of Mode A code by the concerned Approach Radar controller. However, when it is observed that the Mode A code shown on the situation display is different to what has been assigned to the aircraft; the tower controller shall immediately inform to the Approach Radar controller about the discrepancy in assigned Mode A code. In such cases, the pilot shall be requested to confirm the code selected and, if the situation warrants (e.g. not being a case of unlawful interference), to reselect the correct code.*

8.5.3.2.3 If direction, level, speed, track or any other displayed information of an aircraft raises doubt about its identification, additional checks may be made to ensure correctness of identification.

8.5.3.3 PSR Identification Procedures:

8.5.3.3.1 Where PSR is used for identification, aircraft may be identified by one or more of the following procedures:

a) By correlating a particular radar position indication with an aircraft reporting its position over or as bearing and distance from, a point shown on the situation display; and by ascertaining that the track of the particular radar position is consistent with the aircraft path or reported heading.

Note: The term "a point" refers to a geographical point suitable for the purposes of identification. It is normally a reporting point defined by reference to a radio navigation aid or aids.

b) By correlating an observed radar position indication with an aircraft which is known to have just departed, provided that the identification is established within 1 NM from the end of the runway used. Particular care should be taken to avoid confusion with aircraft holding over or overflying the aerodrome, or with aircraft departing from or making a missed approach over adjacent runways.

c) By Transfer of Identification**.** (refer para 8.7)

d) By ascertaining the aircraft heading, if circumstances require, and following a period of track observation:

- instructing the pilot to execute one or more changes of heading of 30 degrees or more and correlating the movements of one particular radar position indication with the aircraft's acknowledged execution of the instructions given; or
- correlating the movements of a particular radar position indication with manoeuvres currently executed by an aircraft having so reported.

When using these methods, the radar controller shall:

i) verify that the movements of not more than one radar position indication correspond with those of the aircraft; and

ii) ensure that the manoeuvre(s) will not carry the aircraft outside the coverage of the radar or the situation display.

Note 1: Caution must be exercised when employing these methods in areas where route changes normally take place.

Note 2: With reference to ii) above, para 8.9. regarding vectoring of controlled aircraft should be referred.

8.6 ADDITIONAL IDENTIFICATION:

8.6.1 When two or more position indications are observed in close proximity, or are observed to be making similar movements at the same time, or when doubt exists as to the identity of a position indication for any other reason, changes of heading should be prescribed or repeated as many times as necessary, or additional methods of identification should be employed, until all risk of error in identification is eliminated.

8.6.2 If identification is doubtful due to any reason, a controller shall take immediate action to re-identify the aircraft or terminate the surveillance service.

8.7 TRANSFER OF IDENTIFICATION

8.7.1 Transfer of identification from one controller to another should only be attempted when it is considered that the aircraft is within the accepting controller's surveillance coverage.

8.7.2 Transfer of identification shall be effected by one of the following methods:

a) designation of the position indication by automated means, provided that only one position indication is thereby indicated and there is no possible doubt of correct identification;

b) notification of the aircraft's discrete SSR code or aircraft address;

Note.— The use of a discrete SSR code requires a system of code assignment which ensures that each aircraft in a given portion of airspace is assigned a discrete code.

c) notification that the aircraft is SSR Mode S-equipped with an aircraft identification feature when SSR Mode S coverage is available;

d) notification that the aircraft is ADS-B-equipped with an aircraft identification feature when compatible ADS-B coverage is available;

e) direct designation (pointing with the finger) of the position indication, if the two situation displays are adjacent, or if a common "conference" type of situation display is used. If parallax is likely to cause an error, an alternative method is to be used;

f) designation of the position indication by reference to, or in terms of bearing and distance from, a geographical position or navigational facility accurately indicated on both situation displays, together with the track of the observed position indication if the route of the aircraft is not known to both controllers.
- The position indication, as seen by the accepting controller, must be within 3 miles of the position stated.
- The distance between the aircraft and the reference point must not exceed:
  i) 30 miles, if the aircraft is flying along a published ATS route or direction is given as a bearing in degrees;
  ii) 15 miles in other circumstances.

Note.— Caution must be exercised before transferring identification using this method, particularly if other position indications are observed on similar headings and in close proximity to the aircraft under control. Inherent radar deficiencies, such as inaccuracies in bearing and distance of the radar position indications displayed on individual situation displays and parallax errors, may cause the indicated position of an aircraft in relation to the known point to differ between the two situation displays.

g) where applicable, issuance of an instruction to the aircraft by the transferring controller to change SSR code and the observation of the change by the accepting controller; or

h) issuance of an instruction to the aircraft by the transferring controller to squawk/transmit IDENT and observation of this response by the accepting controller.

Note.— Use of procedures g) and h) requires prior coordination between the controllers, since the indications to be observed by the accepting controller are of short duration.

8.7.3 When radar identification is not terminated during transfer of control and radar identification is established by accepting controller by Transfer of Identification, the pilot should be informed by using the phraseology “RADAR CONTACT”, however; when inter-unit/Intra-unit handoff is made to another controller at the same location, the accepting controller need not use “IDENTIFIED” or “RADAR CONTACT’ to reduce RT workload.

8.8 POSITION INFORMATION

8.8.1 An aircraft provided with ATS surveillance service should be informed of its position in the following circumstances:

a) upon identification, except when the identification is established:

i) based on the pilot's report of the aircraft position or within one nautical mile of the runway upon departure and the observed position on the situation display is consistent with the aircraft's time of departure; or

ii) by use of ADS-B aircraft identification, Mode S aircraft identification or assigned discrete SSR codes and the location of the observed position indication is consistent with the current flight plan of the aircraft; or

iii) by transfer of identification;

b) when the pilot requests this information;

c) when a pilot's estimate differs significantly from controller's estimate based on the observed position;

d) when the pilot is instructed to resume own navigation after vectoring if the current instructions had diverted the aircraft from a previously assigned route,

e) immediately before termination of ATS surveillance service, if the aircraft is observed to deviate from its intended route.

8.8.2 Position information shall be passed to aircraft in one of the following forms:

a) as a well-known geographical position;

b) magnetic track and distance to a significant point, an en-route navigation aid, or an approach aid;

c) direction (using points of the compass) and distance from a known position;

d) distance to touchdown, if the aircraft is on final approach; or

e) distance and direction from the centre line of an ATS route.

8.8.3 Whenever practicable, position information shall relate to positions or routes pertinent to the navigation of the aircraft concerned and shown on the situation display map.

8.8.4 When so informed, the pilot may omit position reports at compulsory reporting points or report only over those reporting points specified by the air traffic services unit concerned, including points at which air-reports are required for meteorological purposes. Unless automated position reporting is in effect (e.g. ADS-C), pilots shall resume voice or CPDLC position reporting:

a) when so instructed;

b) when advised that the ATS surveillance service has been terminated; or

c) when advised that identification is lost.

8.9 VECTORING

8.9.1 Vectoring shall be achieved by issuing to the pilot specific headings which will enable the aircraft to maintain the desired track. When vectoring an aircraft, a controller shall comply with the following:

8.9.1.1 Whenever practicable, the aircraft shall be vectored along tracks on which the pilot can monitor the aircraft position with reference to pilot-interpreted navigation aids (this will minimize the amount of navigational assistance required and alleviate the consequences resulting from an ATS surveillance system failure);

8.9.1.2 When an aircraft is given its initial vector diverting it from a previously assigned route, the pilot shall be informed, what the vector is to accomplish and, the limit of the vector shall be specified (e.g. to ... position, for ... approach);

8.9.1.3 Except when transfer of control is to be effected, aircraft shall not be vectored closer than 2.5 NM, or, where the minimum permissible separation is greater than 5 NM is prescribed, a distance equivalent to one half of the prescribed separation minimum, from the limit of the airspace for which the controller is responsible, unless local arrangements have been made to ensure that separation will exist with aircraft operating in adjoining areas;

8.9.1.4 Controlled flights shall not be vectored into uncontrolled airspace except in the case of emergency or in order to circumnavigate adverse meteorological conditions (in which case the pilot should be so informed), or at the specific request of the pilot; and

8.9.1.5 When an aircraft has reported unreliable directional instruments, the pilot shall be requested, prior to the issuance of manoeuvring instructions, to make all turns at an agreed rate and to carry out the instructions immediately upon receipt.

8.9.2 When vectoring an IFR flight and giving an IFR flight a direct routing which takes the aircraft off an ATS route, the controller shall issue clearances such that the prescribed obstacle clearances will exist at all times until the aircraft reaches the point where the pilot will resume own navigation.

Note 1.— When an IFR flight is being vectored, the pilot is often unable to determine the aircraft's exact position and consequently the altitude which provides the required obstacle clearance. .

8.9.3 When ATC provides vectors to a VFR flight, the pilot retains responsibility for terrain clearance.

8.9.4 Report of incidents involving activations of aircraft ground proximity warning systems shall be encouraged so that their locations can be identified and altitude, routing and/or aircraft operating procedures can be altered to prevent recurrences.

8.9.5 In terminating vectoring of an aircraft, the controller shall instruct the pilot to resume own navigation, giving the pilot the aircraft's position and appropriate instructions, as necessary, in the form prescribed in 8.8.2 b), if the current instructions had diverted the aircraft from a previously assigned route.

8.10 NAVIGATION ASSISTANCE

8.10.1 An identified aircraft observed to deviate significantly from its intended route or designated holding pattern shall be advised accordingly. Appropriate action shall also be taken if, in the opinion of the controller, such deviation is likely to affect the service being provided.

8.10.2 The pilot of an aircraft requesting navigation assistance from an air traffic control unit providing ATS surveillance services shall state the reason (e.g. to avoid areas of adverse weather or unreliable navigational instruments) and shall give as much information as possible in the circumstances.

8.11 INTERRUPTION OR TERMINATION OF ATS SURVEILLANCE SERVICE

8.11.1 An aircraft which has been informed that it is provided with ATS surveillance service should be informed immediately when, for any reason, the service is interrupted or terminated.

8.11.2 ATS surveillance service is automatically terminated when an arriving aircraft receiving service has been instructed to contact tower frequency. Position of aircraft to touch down should be given to the aircraft before changing over the aircraft to tower.

8.11.3 When the control of an identified aircraft is to be transferred to a control sector that will provide the aircraft with procedural separation, the transferring controller shall ensure that appropriate procedural separation is established between that aircraft and any other controlled aircraft before the transfer is effected.

8.12 MINIMUM LEVELS

8.12.1 The controller shall at all times be in possession of full and up-to-date information regarding:

a) established minimum flight altitudes within the area of responsibility;

b) the lowest usable flight level or levels determined

c) established minimum altitudes applicable to procedures based on tactical vectoring.

8.12.2 Unless otherwise specified, minimum altitude for procedures based on tactical vectoring with any ATS surveillance system shall be determined using the criteria applicable to tactical radar vectoring.

8.13 INFORMATION REGARDING ADVERSE WEATHER

8.13.1 Modern ATS surveillance system and processors are normally designed to suppress weather clutter. Even the most active areas of adverse weather may not be presented on the situation display. An aircraft's weather radar will normally provide better detection and definition of adverse weather than radar sensors in use by ATC.

8.13.2 If, however weather is observed that appears likely to affect the flight, the controller may pass the information to the pilot.

8.13.3 If an aircraft is equipped with weather radar and the pilot intends to circumnavigate the adverse weather area observed on his situation display, he should intimate and obtain clearance from controller for his proposed action. This is necessary to ensure that separation which the controller may be providing to any other aircraft is not jeopardized.

8.13.4 In vectoring an aircraft for circumnavigating any area of adverse weather, the controller should ascertain that the aircraft can be returned to its intended or assigned flight path within the coverage of ATS surveillance system and, if this does not appear possible, inform the pilot of the circumstances.

Note.— Attention must be given to the fact that under certain circumstances the most active area of adverse weather may not be displayed.

8.14 REPORTING OF SIGNIFICANT METEOROLOGICAL INFORMATION TO METEOROLOGICAL OFFICES

8.14.1 Although a controller is not required to keep a special watch for heavy precipitation, etc. information on the position, intensity, extent and movement of significant meteorological conditions (i.e. heavy showers or well-defined frontal surfaces) as observed on situation displays, should, when practicable, be reported to the associated meteorological office.

8.15 SEPARATION APPLICATION

Note.— Factors which the controller using an ATS surveillance system must take into account in determining the spacing to be applied in particular circumstances in order to ensure that the separation minimum is not infringed include aircraft relative headings and speeds, ATS surveillance system technical limitations, controller workload and any difficulties caused by communication congestion.

8.15.1 Except as provided for in 8.15.5, 8.15.6 and 8.19.2.2, the separation minima specified in 8.16 shall only be applied between identified aircraft when there is reasonable assurance that identification will be maintained.

8.15.2 When control of an identified aircraft is to be transferred to a control sector that will provide the aircraft with procedural separation, such separation shall be established by the transferring controller before the aircraft reaches the limits of the transferring controller's area of responsibility, or before the aircraft leaves the relevant area of surveillance coverage.

8.15.3 Separation based on the use of ADS-B, SSR and/or MLAT, and/or PSR position symbol shall be applied so that the distance between the centres of the position symbols representing the positions of the aircraft concerned, is never less than a prescribed minimum.

8.15.4 In no circumstances shall the edges of the position indications touch or overlap unless vertical separation is applied between the aircraft concerned, irrespective of the type of position indication displayed and separation minimum applied.

8.15.5 In the event that the controller has been notified of a controlled flight entering or about to enter the airspace within which separation minima specified in 8.16 is applied, but has not identified the aircraft, the controller may continue to provide ATS surveillance service to identified aircraft provided that:

a) reasonable assurance exists that the unidentified controlled flight will be identified using SSR and/or ADS-B and/or MLAT or the flight is being operated by an aircraft of a type which may be expected to give an adequate return on primary radar in the airspace within which the separation is applied; and
b) the separation is maintained between identified flights and any other observed ATS surveillance position indications until either the unidentified controlled flight has been identified or procedural separation has been established.

8.15.6 The separation minima specified in 8.16 may be applied between an aircraft taking off and a preceding departing aircraft or other identified traffic provided there is reasonable assurance that the departing aircraft will be identified within 1 NM from the end of the runway, and that, at the time, the required separation will exist.

8.15.7 Separation minima specified in 8.16 shall not be applied between aircraft holding over the same holding fix. When applying ATS surveillance separation between holding aircraft and other flights, the controller shall maintain identity of holding aircraft for the provision of separation minima based on radar and/or ADS-B and/or MLAT to other flights. No doubt shall exist about the identity of holding aircraft for any reason when such separation is applied. The controller shall also keep in mind the likely manoeuvres of the holding aircraft during application of such separation.

8.16 Separation minima based on ATS surveillance systems

8.16.1 Except as provided for in 8.16.4 the following horizontal separation minima based on radar and/or ADS-B and/or MLAT systems shall be applied:

a) 5 NM horizontal separation upto 60 NM from radar head,

b) 5 NM within 60 NM of ADS-B ground station when only ADS-B is used in non-radar environment

c) 10 NM horizontal separation beyond 60 NM from radar head

d) 10 NM beyond 60 NM of ADS-B ground station when only ADS-B is used in non-radar environment.

e) 3 NM from radar head where specifically authorized.

8.16.2 Where ADS-B and /or MLAT is/are used in combination with radar the horizontal separation minima applicable will be same as applicable to the separation based on radar.

8.16.3 Where MLAT is used alone the horizontal separation minima applicable will be as notified/prescribed before its implementation.

8.16.4 The distance based wake turbulence separation minima as given in Table 8-2 shall be applied to aircraft being provided with an ATS surveillance service in the approach and departure phases of flight in the circumstances given in 8.16.5.

Preceding Aircraft	Succeeding Aircraft	Distance Base Wake Turbulence Separation Minima
A380-800/ Non A380-800 HEAVY	A380-800	Not required+
A380-800	Non A380-800 HEAVY	6 NM*
	MEDIUM	7 NM*
	LIGHT	8 NM*
HEAVY	HEAVY	4 NM*
	MEDIUM	5 NM*
	LIGHT	6 NM*
MEDIUM	HEAVY	Not required+
	MEDIUM	Not required+
	LIGHT	5 NM*
LIGHT	HEAVY	Not required+
	MEDIUM	Not required+
	LIGHT	Not required+

Table 8-2: Wake turbulence separation minima in ATS surveillance service

+ When a wake turbulence restriction is not required, then separation reverts to prescribed horizontal separation minimum.

* In the airspace wherein prescribed horizontal separation minimum is more than applicable wake turbulence separation minimum, prescribed horizontal separation minimum will have precedence over wake turbulence separation minimum.

8.16.5 The minima set out in 8.16.4 shall be applied when:

i) an aircraft is operating directly behind another aircraft at the same altitude or less than 1000 ft below; or

ii) both aircraft are using the same runway, or parallel runways separated by less than 760 m or

iii) an aircraft is crossing behind another aircraft, at the same altitude or less than 1000 ft below.

8.17 TRANSFER OF CONTROL

8.17.1 Where ATS surveillance service is being provided, transfer of control should be effected, whenever practicable, so as to enable the uninterrupted provision of ATS surveillance service.

8.17.2 Where SSR and/or ADS-B and/or MLAT is used and the display of position indications with associated labels is provided for, transfer of control of aircraft between adjacent control positions or between adjacent ATC units may be effected without prior coordination, provided that:

a) updated flight plan information on the aircraft about to be transferred, including the discrete assigned SSR Code or, with respect to SSR Mode S and ADS-B, the aircraft identification, is provided to the accepting controller prior to transfer;
b) the ATS surveillance coverage provided to the accepting controller is such that the aircraft concerned is presented on the situation display before the transfer is effected and is identified on, but preferably before, receipt of the initial call;
c) when the controllers are not physically adjacent, two-way direct speech facilities, which permit communications to be established instantaneously, are available between them at all times;

Note.— "Instantaneous" refers to communications which effectively provide for immediate access between controllers.

d) the transfer point or points and all other conditions of application, such as direction of flight, specified levels, transfer of communication points, and especially an agreed minimum separation between aircraft, including that applicable to succeeding aircraft on the same route, about to be transferred as observed on the situation display, have been made the subject of specific instructions (for intra-unit transfer) or of a specific letter of agreement between two adjacent ATC units;
e) the instructions or letter of agreement specify explicitly that the application of this type of transfer of control may be terminated at any time by the accepting controller, normally with an agreed advance notice;
f) the accepting controller is informed of any level, speed or vectoring instructions given to the aircraft prior to its transfer and which modify its anticipated flight progress at the point of transfer.

8.17.3 The minimum agreed separation between aircraft about to be transferred (refer 8.17.2 d) and the advance notice (refer 8.17.2 e) shall be determined taking into account all relevant technical, operational and other circumstances. If circumstances arise in which these agreed conditions can no longer be satisfied, controllers shall revert to the procedure in 8.17.4 until the situation is resolved.

8.17.4 Where primary radar is being used, and where another type of ATS surveillance system is employed but the provisions of 8.17.2 are not applied, the transfer of control of aircraft between adjacent control positions or between two adjacent ATS units may be effected, provided that:

a) identification has been transferred to or has been established directly by the accepting controller;

b) when the controllers are not physically adjacent, two-way direct-speech facilities between them are at all times available which permit communications to be established instantaneously;

c) separation from other controlled flights conforms to the minima authorized for use during transfer of control between the sectors or units concerned;

d) the accepting controller is informed of any level, speed or vectoring instructions applicable to the aircraft at the point of transfer;

e) radio-communication with the aircraft is retained by the transferring controller until the accepting controller has agreed to assume responsibility for providing the ATS surveillance service to the aircraft. Thereafter, the aircraft should be instructed to change over to the appropriate channel and from that point is the responsibility of the accepting controller.

8.18 SPEED CONTROL PROCEDURES AND SPEED MINIMA

8.18.1 In order to facilitate sequencing or to reduce the need for vectoring, a controller, subject to consideration of the aircraft performance limitation, may request aircraft to adjust their speed in a specified manner.

8.18.2 In order to facilitate safe and orderly flow of arriving air traffic within terminal area where surveillance based approach control services have been established, aircraft shall follow the speed in specified manner as provided in Table 8-3.

8.18.3 The speed control is applied for ATC separation purposes and is mandatory in the interest of acquiring accurate spacing.

8.18.4 Speed control is also necessary to achieve the desired separation minimum or spacing between the successive arrivals. This in turn would improve the utilization of airspace and enhance the runway capacity to handle more number of aircraft.

8.18.5 Aircraft unable to comply with the specified speeds must inform ATC and report minimum speed it is able to follow. In such cases controller shall apply the alternative method to achieve the desired spacing between aircraft concerned.

8.18.6 The speeds specified in Table 8-3 are within the limits of turboprops and turbojets aircraft performance based on the ICAO recommendations and best international practices and therefore should be acceptable. However it is the pilot's responsibility and prerogative to refuse speed restrictions that are considered excessive or contrary to the aircraft operating specifications.

8.18.7 Surveillance controller may remove an aircraft from the sequence for repositioning if it is observed that aircraft concerned is not following the speed restrictions in the specified manner and closing-in with preceding aircraft or slowing down unnecessarily thus disrupting the traffic flow.

8.18.8 Speed control shall not be applicable to aircraft:

i. entering or established in holding pattern;
ii. encountering the turbulent weather;
iii. conducting the Cat II/III operations and within 20NM from touch-down;
iv. within 5NM from touch-down;
v. executing the published instrument approach procedure until interception of final approach track;
vi. carrying VVIP and
vii. conducting priority/emergency landing.

8.18.9 Aircraft shall be advised as and when speed control restriction is not applicable or no longer required.

8.18.10 While applying the speed control, the following additional information is provided for controllers and pilots:

i. Speed adjustments are not achieved instantaneously. Aircraft configurations, altitude and speed determine the time and distance to accomplish the adjustments.
ii. Speed control shall not be assigned to an aircraft at or above FL 390 without pilot's consent.
iii. Speed control should be expressed in multiples of 10 kt based on indicated airspeed (IAS). At or above F250 the adjustments should be expressed in multiples of 0.01 Mach.
iv. For the same indicated air speed (IAS), the true speed of aircraft will vary with altitude. A table representing indicated air speed vs. true air speed at different altitude is provided at Table 8-4. Surveillance controllers must be aware of speed differentials between IAS and TAS.
v. Simultaneous speed reduction and descent can be extremely difficult, particularly for turbojet aircraft. It may be necessary for the pilot to level

off temporarily and reduce speed prior to descending below 10000 ft AMSL.

vi. Arriving aircraft would prefer to fly in clean configuration for as long as circumstances permit. Below 10000 ft AMSL, speed not less than 210Kt IAS is considered as minimum speed of turbojet aircraft in clean configuration.

vii. Speed adjustments requiring alternate decrease and increase shall be avoided particularly after the aircraft has reduced the speed below 210kt. In such cases the Phraseology", No ATC speed restriction", or "Resume normal speed" shall only be used.

NOTE: Subject to aircraft performance limitations a radar controller may assign a specific speed to the aircraft in order to maintain/achieve required spacing

8.18.11 Pictorial depiction of speed specifications within 30DME and below FL150 is provided in Figure-8-1.

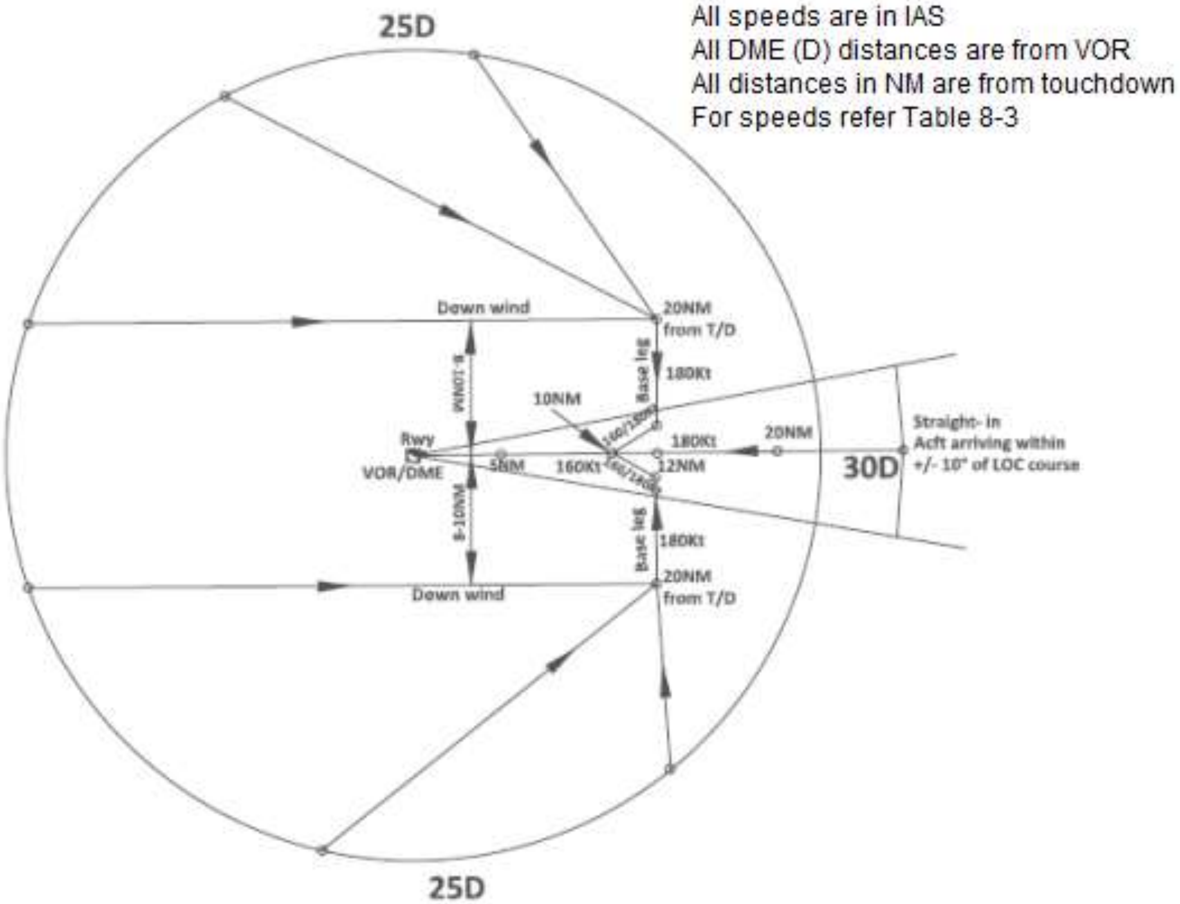


Figure 8-1: Illustration of Speed control under surveillance environment below FL150 and within 30 DME.

Phase of flight	IAS		Status	Remarks
	Turboprop	Turbojet		
Enroute and initial descent upto FL 290	N/A	250 kt or actual whichever is higher	Optional/ As per requirement of ATC	Speed less than 250 kt will be subject to concurrence of pilot
Below FL 290 and upto FL 150	250 kt or actual speed whichever is lower	250 kt or actual whichever is higher	Optional/ As per requirement of ATC	Speed less than 250 kt will be subject to concurrence of pilot. Below FL 210 speed may be reduced to 240 kt by ATC with the concurrence of pilot
Below FL 150 & within 25D to 20NM (30D to 20 NM in case of straight-in) or on Downwind	220 kt or actual speed whichever is lower	220 kt or minimum clean speed whichever is higher	Mandatory	Below 10000 ft AMSL speed may be reduced to 210 kt by ATC subject to concurrence of pilot
Within 20NM from touch down	180 kt	180 kt	Mandatory	Speed may be further reduced to 170Kt by ATC
Intercept leg or 12NM from touch-down in case of straight-in	180-160 kt	180 -160 kt	Mandatory	Speed to be reduced to 160 kt during the intercept leg
10 - 5 NM from Touchdown **	160-150 kt	160 kt	Mandatory	Turboprop aircraft unable to maintain the specified speed must inform ATC as early as possible preferably during intercept leg or when 12 NM from touchdown. ** At the time approach clearance is issued, speed restrictions shall remain applicable unless withdrawn by ATC
Within 5NM from touch down	N/A	N/A	N/A	

Table 8-3: Speed Control under Radar Environment for Arriving Aircraft

(All DME (D) Distances are from VOR and all distances in NM are from touchdown)

IAS (kt) →	160	180	210	220	240	250	260
Altitude (ft)							
2000	169	190					
3000	172	193					
4000	174	196	229	239			
5000	177	199	232	243			
6000		202	236	247			
8000			241	255			
10000			251	263	289	299	
12000			259	272	296	309	
14000			268	281	306	319	
15000					308	321	
17000					322	335	
20000					338	353	
21000						349	
24000						366	
25000						372	
26000						377	
28000						391	
30000							418
31000							425
32000							432
34000							446

Table 8-4: Indicated Airspeed (IAS) Vs. True Airspeed (TAS) at different altitude at ISA + 15° C

8.19 EMERGENCIES, HAZARDS AND EQUIPMENT FAILURES

8.19.1 Emergencies

8.19.1.1 In the event of an aircraft in, or appearing to be in, any form of emergency, every assistance shall be provided by the controller, and the procedures prescribed herein may be varied according to the situation.

8.19.1.2 The progress of an aircraft in emergency shall be monitored and (whenever possible) plotted on the situation display until the aircraft passes out of coverage of the ATS surveillance system, and position information shall be provided to all air traffic services units which may be able to give assistance to the aircraft. Transfer to adjacent sectors shall also be effected when appropriate.

Note.— If the pilot of an aircraft encountering a state of emergency has previously been directed by ATC to select a specific transponder code and/or an ADS-B emergency mode, that code/mode will normally be maintained unless, in special circumstances, the pilot has decided or has been advised otherwise. Where ATC has not requested a code or emergency mode to be set, the pilot will set the transponder to Mode A Code 7700 and/or the appropriate ADS-B emergency mode.

8.19.1.3 Whenever a general ADS-B emergency alert is observed on the situation display and there is no other indication of the particular nature of the emergency, the controller shall take the following action:

a) attempt to establish communication with the aircraft to verify the nature of the emergency; or

b) if no response is received from the aircraft, the controller shall attempt to ascertain if the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed on the situation display.

Note 1.- Some aircraft equipped with first generation ADS-B avionics have the capability to transmit a general emergency alert only, regardless of the code selected by the pilot.

Note 2.- Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

8.19.2 Collision hazard information

8.19.2.1 When an identified controlled flight is observed to be on a conflicting path with an unknown aircraft deemed to constitute a collision hazard, the pilot of the controlled flight shall, whenever practicable:

a) be informed of the unknown aircraft and if so requested by the controlled flight or, if in the opinion of the controller the situation warrants, a course of avoiding action should be suggested; and

b) be notified when the conflict no longer exists.

8.19.2.2 When an identified IFR flight operating outside controlled airspace is observed to be on a conflicting path with another aircraft, the pilot should:

a) be informed as to the need for collision avoidance action to be initiated, and if so requested by the pilot or if, in the opinion of the controller, the situation warrants, a course of avoiding action should be suggested; and

b) be notified when the conflict no longer exists.

8.19.2.3 In both cases mentioned in 8.19.2.1 and 8.19.2.2 the decision whether to comply with ATC suggestion or not, rests with the pilot.

8.19.2.4 Information regarding traffic on a conflicting path should be given, whenever practicable, in the following form:

a) relative bearing of the conflicting traffic in terms of the 12-hour clock;

b) distance from the conflicting traffic in nautical miles;

c) direction in which the conflicting traffic appears to be proceeding;

d) level and type of aircraft or, if unknown, relative speed of the conflicting traffic, e.g. slow or fast.

8.19.2.5 Pressure-altitude-derived level information, even when unverified, should be used in the provision of collision hazard information because such information, particularly if available from an otherwise unknown aircraft (e.g. a VFR flight) and given to the pilot of a known aircraft, could facilitate the location of a collision hazard.

8.19.2.5.1 When the pressure-altitude-derived level information has been verified, the information shall be passed to pilots in a clear and unambiguous manner. If the level information has not been verified, the accuracy of the information should be considered uncertain and the pilot shall be informed accordingly.

8.19.3 Failure of equipment

8.19.3.1 *Aircraft Radio Transmitter Failure*

8.19.3.1.1 If two-way communication is lost with an aircraft, the controller should determine whether or not the aircraft's receiver is functioning by instructing the aircraft on the channel so far used to acknowledge by making a specified manoeuvre and by observing the aircraft's track, or by instructing the aircraft to operate IDENT or to make SSR code and/or ADS-B transmission changes.

Note1..— Transponder-equipped aircraft experiencing radio-communication failure will operate the transponder on Mode A Code 7600.

Note2.- ADS-B-equipped aircraft experiencing radio-communication failure may transmit the appropriate ADS-B emergency an/or urgency mode.

8.19.3.1.2 If the action prescribed in 8.19.3.1.1 is unsuccessful, it shall be repeated on any other available channel on which it is believed that the aircraft might be listening.

8.19.3.1.3 In both the cases covered by 8.19.3.1.1 and 8.19.3.1.2, any manoeuvring instructions shall be such that the aircraft would regain its current cleared track after having complied with the instructions received.

8.19.3.1.4 Where it has been established by the action in 8.19.3.1.1 that the aircraft's radio receiver is functioning, continued control can be effected using SSR code/ADS-B transmission changes or IDENT transmissions to obtain acknowledgement of clearances issued to the aircraft.

8.19.3.2 *Complete Aircraft Communication Failure:* When a controlled aircraft experiencing complete communication failure is operating or expected to operate in an area and at flight levels where an ATS surveillance service is applied, separation specified in 8.16 may continue to be used. However, if the aircraft experiencing the communication failure is not identified, separation shall be applied between identified aircraft and all unidentified aircraft observed along the expected route of the aircraft with the communication failure, until such time as it is known, or can safely be assumed, that the aircraft with radio communication failure has passed through the airspace concerned, has landed, or has proceeded elsewhere.

8.19.3.3 *Aircraft Transponder Failure in areas where the carriage of a functioning transponder is mandatory:*

8.19.3.3.1 When an aircraft experiencing transponder failure after departure is operating or expected to operate in an area where the carriage of a functioning transponder with specified capabilities is mandatory, the ATC units concerned should endeavour to provide for continuation of the flight to the aerodrome of first intended landing in accordance with the flight plan. However, in certain traffic situations, either in terminal areas or en-route, continuation of the flight may not be possible, particularly when failure is detected shortly after take-off. The aircraft may then be required to return to the departure aerodrome or to land at the nearest suitable aerodrome acceptable to the operator concerned and to ATC.

8.19.3.3.2 In case of a transponder failure which is detected before departure from an aerodrome where it is not practicable to effect a repair, the aircraft concerned should be permitted to proceed, as directly as possible, to the nearest suitable aerodrome where repair can be made. When granting clearance to such aircraft, ATC should take into consideration the existing or anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight. Subsequent adjustments may become necessary during the course of the flight.

8.19.4 ATS surveillance system failure

8.19.4.1 In the event of complete failure of the ATS surveillance system where air-ground communications remain, the controller shall plot the position of all aircraft already identified, take the necessary action to establish procedural separation between the aircraft and, if necessary, limit the number of aircraft permitted to enter the area.

8.19.4.2 As an emergency measure, use of flight levels spaced by half the applicable vertical separation minimum may be resorted to temporarily if standard procedural separation cannot be provided immediately.

8.19.5 Degradation of aircraft position source data

8.19.5.1 In order to reduce the impact of a degradation of aircraft position source data, for example, a receiver autonomous integrity monitoring (RAIM) outage for GNSS; contingency procedures to be followed by control positions and ATC units in the event of data degradation shall be established and published in MATS-Part 2.

8.19.6 Ground radio failure

8.19.6.1 In the event of complete failure of the ground radio equipment used for control, the controller shall, unless able to continue to provide the ATS surveillance service by means of other available communication channels, proceed as follows:

a) without delay inform all adjacent control positions or ATC units, as applicable, of the failure;

b) apprise such positions or units of the current traffic situation;

c) request their assistance, in respect of aircraft which may establish communications with those positions or units, in establishing and maintaining separation between such aircraft; and

d) instruct adjacent control positions or ATC units to hold or reroute all controlled flights outside the area of responsibility of the position or ATC unit that has experienced the failure until such time that the provision of normal services can be resumed.

8.20 USE OF ATS SURVEILLANCE SYSTEM IN THE APPROACH CONTROL SERVICE

8.20.1 General provision:

8.21.1.1 ATS surveillance systems used in the provision of approach control service shall be appropriate to the functions and level of service to be provided.

8.20.2 General Approach control Procedures using ATS surveillance systems:

8.20.2.1 The aerodrome controller shall be kept informed of the sequence of arriving aircraft by the approach radar controller, as well as any instructions and restrictions which have been issued to such aircraft in order to maintain separation after transfer of control to the aerodrome controller.

8.20.2.2 Prior to, or upon commencement of, vectoring for approach, the pilot shall be advised of the type of approach as well as the runway to be used.

8.20.2.3 The controller shall advise an aircraft being vectored for an instrument approach of its position at least once prior to commencement of final approach.

8.20.2.4 When giving distance information, the controller shall specify the point or navigation aid to which the information refers.

8.20.2.5 The initial and intermediate approach phases of an approach executed under the direction of a controller comprise those parts of the approach from the time vectoring is initiated for the purpose of positioning the aircraft for a final approach, until the aircraft is on final approach and:

a) established on the final approach path of a pilot-interpreted aid; or

b) reports that it is able to complete a visual approach; or

c) ready to commence a surveillance radar approach;

8.20.2.6 Aircraft vectored for final approach should be given a heading or a series of headings calculated to close with the final approach track. The final vector shall enable the aircraft to be established on the final approach track prior to intercepting the specified or nominal glide path of the approach procedure from below, and should provide an intercept angle with the final approach track of 45 degrees or less.

8.20.2.7 Whenever an aircraft is assigned a vector which will take it through the final approach track, it should be advised accordingly, stating the reason for the vector.

8.20.3 Vectoring to pilot-interpreted final approach aid

8.20.3.1 An aircraft vectored to intercept a pilot-interpreted final approach aid shall be instructed to report when established on the final approach track. Clearance for the approach should be issued prior to when the aircraft reports established, unless circumstances preclude the issuance of the clearance at such time. Vectoring will normally terminate at the time the aircraft leaves the last assigned heading to intercept the final approach track.

8.20.3.2 When clearance for the approach is issued, aircraft shall maintain last assigned level until intercepting the specified or nominal glide path of the approach procedure. If ATC requires an aircraft to intercept the glide path at a level other than a level flight segment depicted on the instrument approach chart, ATC shall instruct the pilot to maintain the particular level until established on the glide path.

8.20.3.3 The controller shall be responsible for maintaining separation specified in 8.15 between succeeding aircraft on the same final approach, except that the responsibility may be transferred to the aerodrome controller in accordance with procedures prescribed in MATS- Part 2 and provided an ATS surveillance system is available to the aerodrome controller.

8.20.3.4 Transfer of control of succeeding aircraft on final approach to the aerodrome controller shall be effected in accordance with procedures prescribed in MATS-Part 2.

8.20.3.5 Transfer of communications to the aerodrome controller should be effected at such a point or time that clearance to land or alternative instructions can be issued to the aircraft in a timely manner.

8.20.4 Surveillance Radar Approaches

8.20.4.1 *General Provisions*

8.20.4.1.1 During the period that a controller is engaged in giving surveillance radar approaches, he or she should not be responsible for any duties other than those directly connected with such approaches.

8.20.4.1.2 Controllers conducting surveillance radar approaches shall be in possession of information regarding the obstacle clearance altitudes/heights established for such approaches.

8.20.4.1.3 Prior to commencement of a surveillance radar approach, the aircraft shall be informed of:

a) the runway to be used;

b) the applicable obstacle clearance altitude/height;

c) the angle of the nominal glide path

d) the procedure to be followed in the event of radio-communication failure.

8.20.4.1.4 When a radar approach cannot be continued due to any circumstance, the aircraft should be immediately informed that a radar approach or continuation thereof is not possible. The approach should be continued if this is possible using non-radar facilities or if the pilot reports that the approach can be completed visually; otherwise an alternative clearance should be given.

8.20.4.1.5 Aircraft making a radar approach should be reminded, when on final approach, to check that the wheels are down and locked.

8.20.4.1.6 The controller conducting the approach should notify the aerodrome controller when an aircraft making a radar approach is approximately 8 NM from touchdown. If landing clearance is not received at this time, a subsequent notification should be made at approximately 4 NM from touchdown and landing clearance requested.

8.20.4.1.7 Clearance to land or any alternative clearance received from the aerodrome controller or, when applicable, the procedural controller should normally be passed to the aircraft before it reaches a distance of 2 NM from touchdown.

8.20.4.1.8 An aircraft making a radar approach should:

a) be directed to execute a missed approach in the following circumstances:

i) when the aircraft appears to be dangerously positioned on final approach; or

ii) for reasons involving traffic conflictions; or

iii) if no clearance to land has been received from the aerodrome controller by the time the aircraft reaches a distance of 2 NM from touch-down or such other distance as has been agreed with the aerodrome control tower; or

iv) on instructions by the aerodrome controller; or

b) be advised to consider executing a missed approach in the following circumstances:

i) when the aircraft reaches a position from which it appears that a successful approach cannot be completed; or

ii) if the aircraft is not visible on the situation display for any significant interval during the last 2 NM of the approach; or

iii) if the position or identification of the aircraft is in doubt during any portion of the final approach.

In all such cases, the reason for the instruction or the advice should be given to the pilot.

8.20.4.1.9 Unless otherwise required by exceptional circumstances, radar instructions concerning a missed approach should be in accordance with the prescribed missed approach procedure and should include the level to which the aircraft is to climb and heading instructions to keep the aircraft within the missed approach area during the missed approach procedure.

8.20.5 Final approach procedures

8.20.5.1. A surveillance radar approach shall only be performed with equipment suitably sited and a situation display specifically marked to provide information on position relative to the extended center line of the runway to be used and distance from touchdown, and where surveillance radar approaches are promulgated.

8.20.5.2 When conducting a surveillance radar approach, the controller shall comply with the following:

a) at or before the commencement of the final approach, the aircraft shall be informed of the point at which the surveillance radar approach will be terminated;

b) the aircraft shall be informed when it is approaching the point at which it is computed that descent should begin, and just before reaching that point it shall be informed of the obstacle clearance altitude/height and instructed to descend and check the applicable minima;

c) The pilot shall be informed at regular intervals of the aircraft's position in relation to the extended centre line of the runway. Heading corrections shall be given as necessary to bring the aircraft back on to the extended center line.

d) Distance from touch-down shall normally be passed at each NM;

e) pre-computed levels through which the aircraft should be passing to maintain the glide path shall also be transmitted at each NM at the same time as the distance;

f) the surveillance radar approach shall be terminated:

i) at a distance of 2 NM from touchdown, or

ii) before the aircraft enters an area of continuous radar clutter; or

iii) when the pilot reports that a visual approach can be effected;

whichever is the earliest.

8.20.5.3 Levels through which the aircraft should pass to maintain the required glide path, and the associated distances from touchdown, shall be pre-computed and displayed in such a manner as to be readily available to the controller concerned.

8.20.6 Vectoring for Visual Approach

8.20.6.1 The Approach controller (surveillance) may initiate visual approach subject to the following conditions

a) Ground visibility is not below the higher of aerodrome operating minima of associated non-precision approach or minimum visibility/RVR of 2800 m for Category A/B aeroplanes, 3200 m for Category C aeroplanes and 3600 m for Category D aeroplanes. If visual approach is requested for a runway which has only a circling approach, the ground visibility shall not be less than 5 Km, and

b) Concurrence of the flight crew is obtained, and

c) The reported ceiling is above the minimum altitude applicable to vectoring by using ATS surveillance system and meteorological conditions are such that, with reasonable assurance, a visual approach and landing can be completed.

8.20.6.2 Clearance for visual approach shall be issued, provided the aircraft can maintain visual reference to terrain and has the runway in sight at which time vectoring by using ATS surveillance system would normally be terminated.

Phraseologies:

✈*ADVISE ABLE TO ACCEPT VISUAL APPROACH RUNWAY (number)*

✈*(vectoring instruction) VECTORING FOR VISUAL APPROACH RUNWAY (number), REPORT RUNWAY IN SIGHT*

✈*(vectoring instruction) VECTORING FOR) (position in the traffic circuit), REPORT RUNWAY IN SIGHT*

✈*CLEARED VISUAL APPROACH RUNWAY (number), REPORT (position in the traffic circuit)*

8.20.6.3 If the pilot does not sight the runway, the aircraft will either be vectored for pilot interpreted final approach aid / surveillance radar approach or the aircraft will be climbed to minimum holding altitude associated with landing nav-aid and cleared for IAL procedure of the nav-aid.

8.21 USE OF ATS SURVEILLANCE SYSTEMS IN THE AERODROME CONTROL SERVICE

8.21.1 Approach Monitor Aid in Control Tower

8.21.1.1 A display unit of the TAR (ASR/MSSR) when provided in the control tower at the Aerodrome Control Work Station will give view of the final approaches of the runways at the airport.

8.21.1.2 In order to achieve maximum runway utilization and aerodrome capacity, the ATCO on Aerodrome Control duty may use the information derived from the monitor for: –

a) Tactical decision regarding landing and departing aircraft to determine their sequence and spacing.

b) Tactical decision regarding position of aircraft on take-off vis-à-vis the position of proceeding aircraft.

c) Strategical decisions regarding sequencing of departing aircraft to achieve smooth traffic flow;

d) Monitoring pilot's position reports and confirming compliance with the assigned track to departing aircraft;

e) Providing information to an aircraft on the position of another arriving/departing aircraft.

8.21.1.3 The Aerodrome Controller shall not assume control of any aircraft of the Approach Monitor Aid.

8.21.1.4 The Approach Monitor Aid shall not be used to issue heading instructions.

8.21.1.5 The equipment shall not be used to provide ATS surveillance services.

8.21.1.6 The Aerodrome Controller shall issue ATC (Procedural) instructions to aircraft required to go around, delay, and orbit.

8.21.1.7 The monitor at all times will be set to a range published in MATS-Part 2. The ATCO in the Aerodrome Control is not required to make any selections, adjustments, off-centering etc., other than that published in MATS-Part 2.

Note.— Control of aerodrome traffic is based mainly on visual observation of the manoeuvring area and the vicinity of the aerodrome by the aerodrome controller.

8.21.2 Use of ASMGCS for surface movement control`

8.21.2.1 FUNCTIONS

8.21.2.1.1 ASMGCS should be used to augment visual observation of traffic on the manoeuvring area and to provide surveillance of traffic on those parts of the manoeuvring area which cannot be observed visually.

8.21.2.1.2 The information displayed on an ASMGCS display may be used to assist in:

a) monitoring of aircraft and vehicles on the manoeuvring area for compliance with clearances and instructions;

b) determining that a runway is clear of traffic prior to a landing or take-off;

c) providing information on essential local traffic on or near the manoeuvring area;

d) determining the location of aircraft and vehicles on the manoeuvring area;

e) providing directional taxi information to aircraft when requested by the pilot or deemed necessary by the controller. Such information should not be issued in the form of specific heading instructions; and

f) providing assistance and advice to emergency vehicles.

8.21.2.2 IDENTIFICATION OF AIRCRAFT

Where an ATS surveillance system is used, aircraft may be identified by one or more of the following procedures:

a) by correlating a particular position indication with:

i) an aircraft position visually observed by the controller;

ii) an aircraft position reported by the pilot; or

iii) an identified position indication displayed on a situation display;

b) by transfer of identification when authorized in MATS-Part 2; and

c) by automated identification procedures

8.21.2.3 USE OF ASMGCS

8.21.2.3.1 The ASMGCS provided at the workstation of Surface Movement Controller within the limitation of the coverage, may be used for the following purposes:

a) To monitor and assist departing and arriving traffic.

b) To monitor the position of traffic in order to facilitate switching-on of associated taxiway lights.

c) To monitor and assist emergency service vehicles to attend a scene of an incident as necessary.

d) To monitor movement of ground vehicles on the movement area to detect unauthorized entry into maneuvering area.

e) To monitor pilot compliance with the issued instructions.

f) To provide taxi guidance.

g) To provide guidance information to an aircraft uncertain of its position.

h) To monitor push-back for avoiding conflict with traffic in the area.

Note : ASMGCS should not be used by ATC to provide heading instructions for taxi-guidance. Taxi guidance instructions using ASMGCS should be the same as those applicable for visual control.

8.21.2.3.2 The use of ASMGCS for the above listed purposes will not in any way relieve pilots of taxing aircraft or drivers of vehicles or any of their responsibilities in respect of avoiding collision with other objects or structure on the ground.

8.21.2.3.3 The ASMGCS monitor provided at Aerodrome Control workstation may be used for the following purposes:

a) To ascertain that departing aircraft are lined up on the correct runway.

b) To ascertain that arriving aircraft has vacated the runway.

c) To ascertain that aircraft has commenced the take-off run.

d) To ascertain that runway is clear of aircraft, vehicles or obstructions prior to a departure or landing.

8.22 USE OF ATS SURVEILLANCE SYSTEMS IN THE FLIGHT INFORMATION SERVICE

Note.— The use of ATS surveillance system in the provision of flight information service does not relieve the pilot-in-command of an aircraft of any responsibilities, including the final decision regarding any suggested alteration of the flight plan.

8.22.1 The information presented on a situation display may be used to provide identified aircraft with:

a) information regarding any aircraft observed to be on a conflicting path with the radar-identified aircraft and suggestions or advice regarding avoiding action;

b) information on the position of significant weather and, as practicable, advice to the aircraft on how best to circumnavigate any such areas of adverse weather;

Note.— Attention must be given to the fact that under certain circumstances the most active area of adverse weather may not show on a radar display.

c) information to assist the aircraft in its navigation.

8.23 Duties and responsibilities of Air traffic controllers Surveillance and Planning in ATS surveillance environment

8.23.1 The Area Control Centres, where surveillance services are being provided, are generally manned by Area Controller (Procedural) and Area Controller (Surveillance). To facilitate provision of ATS surveillance services and monitoring by the Area Controller (Procedural) a common VHF RTF shall be used by the Area Controller (surveillance) and Area Controller (Procedural).

8.23.2 Controllers shall follow ATC watch take over procedure as contained in para 3.13, Chapter 3 of MATS-Part 1.

8.23.3 The responsibilities of the Area Controllers (procedural) and the Area Controllers (Surveillance) will be as follows:

8.23.3.1 Area Controller (Surveillance) shall

a) Ensure that aircraft are separated within ATS surveillance coverage.

b) Ensure that procedural separation will exist against known traffic when aircraft pass out of radar coverage.

c) In the event of surveillance system failure, he shall ensure that procedural separation is established before requesting the Area Controller (Procedural) to assume control. He shall continue to assist the Area Controller (Procedural) in all matters.

d) When Flight Progress Strips are used, keep the Flight Progress Strips up to date with pertinent data.

e) Coordinate any modification of the procedural clearance with the Planning Controller.

f) Accept and initiate automated hand off whenever required.

g) Coordinate with approach/radar controller for descend of arriving aircraft.

h) Inform WSO about the unserviceability of equipment.

i) Initiate action in case of delayed/missing/emergency aircraft.

j) Any other duties and responsibilities to meet situational objectives

k) Any other additional duties and responsibilities given in MATS- Part 2

8.23.3.2 Area Controller (Procedural) shall:

a) Ensure that standard separation exists between aircraft over the exit points of the sector.

b) Keep the Flight Progress Strip Board updated.

c) Monitor the R/T Frequency (where Surveillance Service is provided) and operate intercom.

d) Coordinate with the Area Controller (Surveillance) on the tasks required, e.g. level change, time requirement over fixes etc. and assist in meeting the situation objectives.

e) Issue clearances, amendment to clearance to adjacent ATS Units.

f) Keep the Area Controller (Surveillance) updated on pertinent information.

g) Ensure Coordination with adjacent ATS Units when so required by the Controller (Surveillance).

h) Issue ATC clearances to air traffic operating to/from other aerodromes within the Flight Information Region/ACCs where applicable.

i) Inform Watch Supervisory Officer about the malfunctioning of frequency, Navigational aids etc.

j) Operate Flight Data Display wherever provided including printing of strips, acknowledgement of FDD Messages.

k) Coordinate with Air Force Movement Liaison Unit (AF MLU) when applicable.

l) In the event of ATS surveillance system failure, assume control of all traffic in his sector of jurisdiction for provision of Area Control Service.

m) Initiate action in case of delayed/missing/emergency aircraft.

n) Any other duties and responsibilities to meet situational objectives

o) Any other additional duties and responsibilities given in MATS-Part 2

CHAPTER 9

FLIGHT INFORMATION SERVICE, ADVISORY SERVICE AND ALERTING SERVICE

9.1 Flight information service

9.1.1 Application

9.1.1.1 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.

9.1.1.2 Where air traffic services units provide both flight information service and air traffic control service, the provision of air traffic control service shall have precedence over the provision of flight information service whenever the provision of air traffic control service so requires.

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

9.1.2 Scope of flight information service

9.1.2.1 Flight information service shall include the provision of pertinent:

a) SIGMET;

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 serviceability of navigation aids;

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.

9.1.2.2 Flight information service provided to flights shall include, in addition to that outlined in 9.1.2.1, 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 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.

Flight information service provided to VFR flights shall include, in addition to that outlined in 9.1.2.1, 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.

9.1.2.3 *Routine Air-reports and Special air-reports*

9.1.2.3.1 Aircraft shall make routine air reports at the designated MET reporting points on designated ATS routes and special observations whenever requested by a meteorological office for specific observation or whenever encountered following weather phenomenon:

- moderate to severe turbulence,
- severe icing,
- hail,
- cumulonimbus clouds,
- low level wind shear and
- any meteorological condition in the opinion of the pilot in command is likely to affect aircraft operation.

9.1.2.3.2 ATS units should transmit, as soon as practicable, routine and special air-reports to the associated meteorological office.

9.1.2.3.3 ATS units should also transmit, as soon as practicable special air-reports to other aircraft concerned, and to other ATS units concerned.

9.1.3 Recording and transmission of information on the progress of flights

9.1.3.1 Information on the actual progress of flights, including those of heavy or medium unmanned free balloons, under neither air traffic control service nor air traffic advisory service shall be:

a) recorded by the air traffic services unit serving the FIR within which the aircraft is flying in such a manner that it is available for reference and in case it is requested for search and rescue action;

b) transmitted by the air traffic services unit receiving the information to other air traffic services units concerned, when so required.

9.1.4 Transfer of responsibility for the provision of flight information service

9.1.4.1 The responsibility for the provision of flight information service to a flight normally passes from the appropriate ATS unit in an FIR to the appropriate ATS unit in the adjacent FIR at the time of crossing the common FIR boundary. However, when coordination is required but communication facilities are inadequate, the former ATS unit shall, as far as practicable, continue to provide flight information service to the flight until it has established two-way communication with the appropriate ATS unit in the FIR it is entering.

9.1.5 Transmission of information

9.1.5.1 *Means of Transmission*

9.1.5.1.1 Except as provided in 9.1.5.2.1, information shall be disseminated to aircraft by one or more of the following means:

a) the preferred method of directed transmission on the initiative of the appropriate ATS unit to an aircraft, ensuring that receipt is acknowledged; or

b) a general call, unacknowledged transmission to all aircraft concerned; or

c) broadcast; or

d) data link.

Note.— It should be recognized that in certain circumstances, e.g. during the last stages of a final approach, it may be impracticable for aircraft to acknowledge directed transmissions.

9.1.5.1.2 The use of general calls shall be limited to cases where it is necessary to disseminate essential information to several aircraft without delay, e.g. the sudden occurrence of hazards, a change of the runway-in-use, or the failure of a key approach and landing aid.

9.1.5.2 Transmission of SIGMET Information and Special Air-reports

9.1.5.2.1 SIGMET information shall be transmitted to aircraft with the least possible delay on the initiative of the appropriate ATS unit, by the preferred method of directed transmission followed by acknowledgement, or by a general call when the number of aircraft would render the preferred method impracticable.

9.1.5.2.2 SIGMET information passed to aircraft shall cover a portion of the route up to two hours' flying time ahead of the aircraft.

9.1.5.2.3 The special air-report information to be passed to aircraft on ground initiative should cover a portion of the route up to one hour's flying time ahead of the aircraft.

9.1.5.3 *Transmission of Information concerning Volcanic Activity*

9.1.5.3.1 Information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash clouds (position of clouds and flight levels affected) shall be disseminated to aircraft by one or more of the means specified in 9.1.5.1.1

9.1.5.4 *Transmission of Information concerning Radioactive Materials and Toxic Chemical Clouds*

9.1.5.4.1 Information on the release into the atmosphere of radioactive materials or toxic chemicals which could affect airspace within the area of responsibility of the ATS unit shall be transmitted to aircraft by one or more of the means specified in 9.1.5.1.1.

9.1.5.5 *Transmission of SPECI AND Amended TAF*

9.1.5.5.1 Special reports in the SPECI code form and amended TAF shall be transmitted on request and supplemented by:

a) directed transmission from the appropriate air traffic services unit of selected special reports and amended TAF for the departure, destination and its alternate aerodromes, as listed in the flight plan; or

b) a general call on appropriate frequencies for the unacknowledged transmission to affected aircraft of selected special reports and amended aerodrome forecasts; or

c) continuous or frequent broadcast to make available current METAR and TAF in areas determined on the basis of regional air navigation agreements where traffic congestion dictates. VOLMET broadcasts are used for this purpose. Based on regional air navigation agreements, VOLMET broadcasts are done from Mumbai and Kolkata at half hourly intervals which contain Current Weather Reports and Aerodrome Forecasts of certain stations. These stations are notified in AIP India. Language used for these broadcasts is English.

Note: *VOLMET broadcasts should use standard radiotelephony phraseologies.*

9.1.5.5.2 The amended aerodrome forecasts to aircraft shall be passed within 60 minutes from the aerodrome of destination, unless the information would have been made available through other means.

9.1.5.6 *Transmission of Information on Heavy or Medium Unmanned Free Balloons*

9.1.5.6.1 Appropriate information as specified in Chapter 14 section 14.2 on heavy or medium unmanned free balloons shall be disseminated to aircraft by one or more of the means specified in 9.1.5.1.1

9.1.5.7 **Operational flight information service (OFIS) broadcasts**

9.1.5.7.1 HF / VHF Operational Flight Information Service (OFIS) broadcasts

9.1.5.7.1.1 The HF / VHF operational flight information service (OFIS) broadcasts are not provided in India as there is no regional air navigation agreement for these requirements.

9.1.5.7.2 *Automatic Terminal Information Service (ATIS)*

9.1.5.7.2.1 The automatic terminal information service (ATIS) broadcast is intended to provide a pilot with a range of information to enable him to make a definite decision about his approach and landing or take-off. It reduces the communication load on the ATS VHF air-ground communication channels.

i. The 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 of ATIS.

ii. The language used for ATIS broadcast shall be English.

iii. The information communicated shall relate to a single aerodrome.

iv. The information communicated shall be updated immediately whenever a significant change occurs.

v. The preparation and dissemination of the ATIS message shall be the responsibility of the ATS unit as per local arrangement.

vi. 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;

vii. 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.

viii. The aerodrome control tower shall, when replying to the message in (vii) above or, in the case of arriving aircraft, appropriate ATS Unit shall provide the aircraft with the current altimeter setting when first cleared to an altitude below the transition level.

ix. The meteorological information shall be extracted from the local meteorological routine or special report.

x. 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.

xi. 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 (viii).

xii. If an aircraft acknowledges receipt of an ATIS that is no longer current, the controller, after ensuring the currency of ATIS, shall advise the aircraft to monitor the current ATIS.

Note: Contents of ATIS should be kept as brief as possible. Information additional to that specified in 9.1.5.7.2.2, for example information already available in aeronautical information publications (AIPs) and NOTAM, should only be included when justified in exceptional circumstances.

9.1.5.7.2.2 The ATIS broadcast messages contain information for arriving and departing aircraft consisting of the following elements of information in the order listed:

a) Name of aerodrome;

b) Designator i.e. the word "INFORMATION" and identification letter from the ICAO alphabet;

c) Time of observation;

d) Type of approach (es) to be expected;

e) The runway(s) in use;

f) Significant Runway surface conditions and, if appropriate braking action;

g) Transition level;

h) Other essential operational information;

i) Surface wind direction (in degrees magnetic) and speed, including significant variations;

*j) 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;

*k) Present weather;

*l) Cloud below 5,000 ft or below the highest minimum sector altitude, whichever is greater; cumulonimbus.

* These elements are replaced by the term "CAVOK", whenever applicable

m) Air temperature;

n) Dew point temperature;

o) Altimeter setting(s);

p) 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 contained in MET report;

q) Trend forecast, when available; and

r) specific ATIS instructions

9.1.5.7.2.3 Where a Data link-automatic terminal information service (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.

9.1.5.7.2.4 Where real-time meteorological information is included in a D-ATIS, 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.

9.1.5.7.2.5 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.

9.2 Air traffic advisory service

9.2.1 The objective of the air traffic advisory service is to make information on collision hazards more effective than it would be in the mere provision of flight information service. It may be provided to aircraft conducting IFR flights in advisory airspace or on advisory routes (Class F airspace).

9.2.2 Air traffic advisory service does not afford the degree of safety and cannot assume the same responsibilities as air traffic control service in respect of the avoidance of collisions, since information regarding the disposition of traffic in the area concerned available to the unit providing air traffic advisory service may be incomplete. Air traffic advisory service does not deliver "clearances" but only "advisory information" and it uses the word "advise" or "suggest" when a course of action is proposed to an aircraft.

Note.— If the flight plan is submitted for the purpose of obtaining air traffic control service, the aircraft is required to wait for an air traffic control clearance prior to proceeding under the conditions requiring compliance with air traffic control procedures. If the flight plan is submitted for the purpose of obtaining air traffic advisory service, the aircraft is required to wait for acknowledgment of receipt by the unit providing the service.

9.2.3 IFR flights when operating within Class F airspace are expected to comply with the same procedures as those applying to controlled flights except that:

a) the flight plan and changes thereto are not subjected to a clearance, since the unit furnishing air traffic advisory service will only provide advice on the presence of essential traffic or suggestions as to a possible course of action;

Note 1.— It is assumed that a pilot will not effect a change in the current flight plan until he or she has notified the intended change to the appropriate ATS unit, and has received acknowledgement or relevant advice.

Note 2.— When a flight is operating or about to operate in a control area to continue eventually into an advisory area or along an advisory route, a clearance may be issued for the whole route, but the clearance as such, or revisions thereto, applies only to those portions of the flight conducted within control areas and control zones. Advice or suggestions would be provided as necessary for the remaining portion of the route.

b) it is for the aircraft to decide whether or not it will comply with the advice or suggestion received and to inform the unit providing air traffic advisory service, without delay, of its decision;

c) air-ground contacts shall be made with the air traffic services unit designated to provide air traffic advisory service within the advisory airspace or portion thereof.

9.2.4 An air traffic services unit providing air traffic advisory service shall:

a) *Advise* the aircraft to depart at the time specified and to cruise at the levels indicated in the flight plan if it does not foresee any conflict with other known traffic.

b) *Suggest* to aircraft a course of action by which a potential hazard may be avoided, giving priority to an aircraft already in advisory airspace over other aircraft desiring to enter such advisory airspace.

c) *Pass* to aircraft traffic information comprising the same information as that prescribed for area control service.

9.2.5 The criteria used as a basis for action under 9.2.4 b) and c) should be at least those laid down for aircraft operating in controlled airspace and should take into account the limitations inherent in the provision of air traffic advisory service, navigation facilities and air-ground communications prevailing in the Region.

9.3 Alerting service

9.3.1 Application

9.3.1.1 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.

9.3.1.2 Flight information centres or area control centers 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.

9.3.1.3 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 center responsible which shall in turn notify the rescue coordination centre, except that notification of the area control centre, flight information centre, or rescue coordination centre shall not be required when the nature of the emergency is such that the notification would be superfluous.

9.3.1.4 Nevertheless, whenever the urgency of the situation so requires, the aerodrome control tower or approach control unit responsible shall first alert and take other necessary steps to set in motion all appropriate local rescue and emergency organizations which can give the immediate assistance required.

9.3.2 Notification of rescue coordination centers

9.3.2.1 Without prejudice to any other circumstances that may render such notification advisable, air traffic services units shall, except as prescribed in 9.3.5.1, notify rescue coordination centres immediately an aircraft is considered to be in a state of emergency in accordance with the following:

a) Uncertainty phase when:

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

2) an aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by air traffic services units, whichever is the later, except when no doubt exists as to the safety of the aircraft and its occupants.

b) Alert phase when:

1) following the uncertainty phase, subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft, or when

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

3) information has been received which indicates that the operating efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely, except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants, or when

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

c) ***Distress phase when:***

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

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

3) information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely, or when

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

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

9.3.2.2 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.

9.3.2.3 Such part of the information specified in 9.3.2.2, which is not available at the time notification is made to a rescue coordination centre, should be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

9.3.2.4 Further to the notification in 9.3.2.1, 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.

9.3.3 Use of communication facilities

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

9.3.4 Plotting aircraft in a state of emergency

9.3.4.1 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. 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.

9.3.5 Information to the operator

9.3.5.1 When an area control or a flight information center 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 9.3.2.1.

9.3.5.2 All information notified to the rescue coordination centre by an area control or flight information centre shall, whenever practicable, also be communicated, without delay, to the operator.

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

9.3.6.1 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 9.3.6.2, be informed of the nature of the emergency as soon as practicable.

9.3.6.2 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.

9.3.7 Action by Air traffic services units

9.3.7.1 When no report from an aircraft has been received within a reasonable period of time (which may be a specified interval prescribed on the basis of regional air navigation agreements) after a scheduled or expected reporting time, the ATS unit shall, within the stipulated period of thirty minutes, endeavour to obtain such report in order to be in a position to apply the provisions relevant to the "Uncertainty Phase" should circumstances warrant such application.

9.3.7.2 When alerting service is required in respect of a flight operated through more than one FIR or control area, and when the position of the aircraft is in doubt, responsibility for coordinating such service shall rest with the ATS unit of the FIR or control area:

i) within which the aircraft was flying at the time of last air-ground radio contact;

ii) that the aircraft was about to enter when last air ground contact was established at or close to the boundary of two FIRs or control areas;

iii) within which the aircraft's intermediate stop or final destination point is located:

a) if the aircraft was not equipped with suitable two way radio communication equipment; or

b) was not under obligation to transmit position reports.

9.3.7.3 The unit responsible for alerting service, in accordance with 9.3.7.2, shall:

— **notify** units providing alerting service in other affected FIRs or control areas of the emergency phase or phases, in addition to notifying the rescue coordination centre associated with it;

— **request** those units to assist in the search for any useful information pertaining to the aircraft presumed to be in an emergency, by all appropriate means and especially those indicated in 9.3.3;

— **collect** the information gathered during each phase of the emergency and, after verifying it as necessary, transmit it to the rescue coordination centre;

— **announce** the termination of the state of emergency as circumstances dictate.

9.3.7.4 In obtaining the necessary information as required under 9.3.2.3, attention shall particularly be given to informing the relevant rescue coordination center of the distress frequencies available to survivors, as listed in Item 19 of the flight plan but not normally transmitted.

CHAPTER 10

COORDINATION

10.1 COORDINATION IN RESPECT OF THE PROVISION OF AIR TRAFFIC CONTROL SERVICE

10.1.1 General

10.1.1.1 The coordination and transfer of control of a flight between successive ATC units and control sectors shall be effected by a dialogue comprising the following stages:

a) notification of the flight in order to prepare for coordination, as necessary;

b) coordination of conditions of transfer of control by the transferring ATC unit;

c) coordination, if necessary, and acceptance of conditions of transfer of control by the accepting ATC unit; and

d) the transfer of control to the accepting ATC unit or control sector.

10.1.1.2 ATC units should, to the extent possible, establish and apply standardized procedures for the coordination and transfer of control of flights, in order, *inter alia*, to reduce the need for verbal coordination. Such coordination procedures shall conform to the procedures contained in the following provisions and be specified in letters of agreement and instructions contained in MATS 2 of the concerned airport, as applicable.

10.1.1.3 Such agreements and instructions shall cover the following as applicable:

a) definition of areas of responsibility and common interest, airspace structure and airspace classification(s);

b) any delegation of responsibility for the provision of ATS ;

c) procedures for the exchange of flight plan and control data, including use of automated and/or verbal coordination messages;

d) means of communication;

e) requirements and procedures for approval requests;

f) significant points, levels or times for transfer of control;

g) significant points, levels or times for transfer of communication;

h) conditions applicable to the transfer and acceptance of control, such as specified altitudes/flight levels, specific separation minima or spacing to be established at the time of transfer, and the use of automation;

i) ATS surveillance system coordination procedures;

j) SSR Code assignment procedure;

k) procedures for departing traffic;

l) designated holding fixes and procedures for arriving traffic;

m) applicable contingency procedures; and

n) any other provisions or information relevant to the coordination and transfer of control of flights.

10.1.2 Coordination between ATC units providing air traffic service within contiguous control areas

10.1.2.1 ATC units shall forward from unit to unit, as the flight progresses, necessary flight plan and control information. When so required by agreement between the appropriate ATS authorities to assist the separation of aircraft, flight plan and flight progress information for flights along specified routes or portions of routes in close proximity to flight information region boundaries shall also be provided to the ATC units in charge of the flight information regions adjacent to such routes or portions of routes.

Note.- Such a route or portion of route is often referred to as an area of common interest, the extent of which is usually determined by the required separation minima.

10.1.2.1.1 The flight plan and control information shall be transmitted in sufficient time to permit reception and analysis of the data by the receiving unit(s) and necessary coordination between the units concerned.

10.1.2.2 Approval Request

10.1.2.2.1 If the flying time from the departure aerodrome of an aircraft to the boundary of an adjacent control area is less than the specified minimum required to permit transmission of the necessary flight plan and control information to the accepting ATC unit after take-off and allow adequate time for reception, analysis and coordination, the transferring ATC unit shall, prior to departure, forward that information to the accepting ATC unit together with a request for approval. The required time period shall be specified in letters of agreement or local instructions, as appropriate.

10.1.2.2.2 In the case of an aircraft in flight requiring an initial clearance when the flying time to the boundary of an adjacent control area is less than 30 minutes, the aircraft shall be held within the transferring ATC unit's control area until the flight plan and control information has been forwarded together with a request for approval, and coordination effected, with the adjacent ATC unit.

10.1.2.2.3 In the case of an aircraft requesting a change in its current flight plan, or of a transferring ATC unit proposing to change the current flight plan of an aircraft, and the flying time of the aircraft to the control area boundary is less than 30 minutes, the revised clearance shall be withheld pending approval of the proposal by the adjacent ATC unit. In other circumstances, revisions to previously transmitted current flight plan and control data shall be transmitted as early as possible, and no approval from the accepting ATC unit shall be required.

10.1.2.2.4 When boundary estimate data are to be transmitted for approval by the accepting unit, the time in respect of an aircraft not yet departed shall be based upon the estimated time of departure as determined by the ATC unit in whose area of responsibility the departure aerodrome is located. In respect of an aircraft in flight requiring an initial clearance, the time shall be based on the estimated elapsed time from the holding point to the boundary plus the time expected to be needed for coordination.

10.1.2.2.5 Procedure and the conditions including specified flying times, under which approval requests are to be forwarded for approval, shall be as specified in letters of agreement / MATS- Part 2.

10.1.2.3 Transfer of control

10.1.2.3.1 The procedures herein shall apply to transfer of control of aircraft as under:

a) From one ATS unit to another adjacent ATS unit where both units are at the same geographical location, viz. Approach Control unit and Area Control Centre of an Airport or two or more Area Control Centres located at the same Airport or ATC center.

b) From one ATS unit to another adjacent ATS Unit where these units are at different geographical locations, viz. two Area Control Centres or two Approach Control Centres located at different airports/ *ATC* centres.

c) From an Upper Area Control center to the corresponding Lower Area Control Centre located at another airport and vice-versa.

d) From one ATS unit where Air Traffic Services are provided by AAI to another adjacent ATS unit where Air Traffic Services are provided by another agency.

10.1.2.3.1.1 The responsibility for the control of an aircraft shall be transferred from ATC unit to the next unit at the time of crossing the common control area boundary as determined by the unit having control of the aircraft or at such other point or time as has been agreed between the two units.

10.1.2.3.1.2 Where specified in LOA (letters of agreement) between the ATC units concerned, and when transferring an aircraft, the transferring unit shall notify the accepting unit that the aircraft is in position to be transferred and specify that the responsibility for control should be assumed by the accepting unit, forthwith at the time of crossing the control boundary or other transfer control point specified in letters of agreement between the ATC units or at such other point or time coordinated between the two units.

10.1.2.3.1.3 If the transfer of control time or point is other than the forthwith, the accepting ATC unit shall not alter the clearance of the aircraft prior to the agreed transfer of control time or point without the approval of the transferring unit. The Transferring unit shall inform the Accepting Unit about any restrictions on Time, Level, Speed, Heading, Rate of Descent/Climb etc., that has been assigned to the aircraft, prior to transfer of communication of the aircraft.

10.1.2.3.1.4 If transfer of communication is used to transfer an aircraft to a receiving ATC unit, responsibility for control shall not be assumed until the time of crossing the control area boundary or other transfer of control point specified in letter of agreement between the ATC units or SOPs.

10.1.2.3.1.5 The Transferring Unit shall not approve any direct routing to a waypoint that lies in the jurisdiction of the Accepting Unit, without prior approval of the Accepting Unit.

10.1.2.3.1.6 There may be cases wherein the waypoint to which the direct routing is assigned, lies within the lateral jurisdiction of the Transferring Unit, but the aircraft is likely to cross the vertical limit of the Transferring Unit before it reaches this waypoint thereby entering the vertical limits of the Accepting Unit. Prior approval of the Accepting Unit shall be obtained before approval of such direct routing.

10.1.2.3.1.7 The Accepting Unit shall not alter the clearance of the aircraft, without the approval of the Transferring Unit, until the aircraft enters its lateral and/or vertical jurisdiction. Coordination shall be affected if the changes in the clearances are necessitated by the Accepting Unit prior to the aircraft crossing the lateral or the vertical limits of the Transferring Unit.

10.1.2.3.1.8 During the bifurcation of the airspaces there are conditions where the Transferring Unit is an Upper Area Control and the Accepting Unit is a Lower Area Control, in such cases the Transferring Unit should ensure an optimum descent profile of an arriving aircraft. Prior coordination for obtaining lower levels from Lower Area Control or higher level from Upper Area Control may be effected by use of appropriate means as given in SOPs/LoAs between the two Area Control Centres in order to allow continuous descend or continuous climb of the aircraft.

10.1.2.4 Transfer of communication

10.1.2.4.1 Except when separation minima specified in 8.15 are being applied, the transfer of air-ground communications of an aircraft from the transferring to the accepting ATC unit shall be made five minutes before the time at which the aircraft is estimated to reach the common control area boundary, unless otherwise agreed between the two ATC units concerned or as specified in LOA.

10.1.2.4.2 When separation minima specified in 8.15 are being applied at the time of transfer of control, the transfer of air-ground communications of an aircraft from the transferring to the accepting ATC unit shall be made immediately after the accepting ATC unit has agreed to assume control.

10.1.2.4.3 The accepting ATC unit shall normally not be required to notify the transferring unit that radio and/or data communication has been established with the aircraft being transferred and that control of the aircraft has been assumed, unless otherwise specified in LOA. The accepting ATC unit shall notify the transferring unit in the event that communication with the aircraft is not established as expected.

10.1.2.4.4 In cases where a portion of a control area is so situated that the time taken by aircraft to traverse it is of a limited duration, agreement should be reached to provide for direct transfer of communication between the units responsible for the adjacent control areas, provided that the intermediate unit is fully informed of such traffic. The intermediate unit shall retain responsibility for coordination and for ensuring that separation is maintained between all traffic within its area of responsibility.

10.1.2.4.5 An aircraft may be permitted to communicate temporarily with a control unit other than the unit controlling the aircraft.

10.1.2.5 Termination of controlled flight

10.1.2.5.1 In the case where a flight ceases to be operated as a controlled flight, i.e. by leaving controlled airspace or by canceling its IFR flight and proceeding on VFR in airspace where VFR flights are not controlled, the ATC unit concerned shall ensure that appropriate information on the flight is forwarded to ATS unit(s) responsible for the provision of flight information and alerting services for the remaining portion of the flight, in order to ensure that such services will be provided to the aircraft.

10.1.2.6 Coordination on ATM automation system with AIDC capability

10.1.2.6.1 Phases of Flight

10.1.2.6.1.1 *Notification Phase*

An Air Traffic Service Unit receives information during the Notification phase on a flight which will at some future time enter its Area of Common Interest (ACI).

10.1.2.6.1.2 *Coordination Phase*

The transferring ATC unit coordinates the condition of transfer of control and if necessary, the accepting ATC unit counter-coordinates the acceptance condition for the flight to be transferred. There are several types of coordination dialogues which may occur, depending on where the aircraft is and what previous dialogues have occurred.

10.1.2.6.1.3 *Transfer of Control Phase*

This phase occurs when the controlling ATSU relinquishes control of the flight to the receiving ATSU and the accepting ATSU accepts the control of flight.

10.1.2.6.2 AIDC Messages

The core messages below are to be supported by all ASIA/PAC ATS Providers using automated data interchange

10.1.2.6.2.1 *ABI (Advance Boundary Information)* is transmitted automatically by the automation system at time or position (adaptable) before the common boundary to give advance information on flights prior to coordination. Changes to a previously transmitted ABI shall be communicated by the automation system automatically by means of another ABI.

10.1.2.6.2.2 *CPL (Current Flight Plan)* is transmitted automatically by the automation system at time or position (adaptable) before the common boundary to initiate initial coordination dialogue between automated ATS system for a specific flight.

10.1.2.6.2.3 *EST (Coordination Estimate)* is transmitted automatically by the automation system at time or position (adaptable) before the common boundary to inform the receiving center of the crossing conditions for aflight and to indicate that the conditions are in compliance with agreements between the two ATS units. EST messages are transmitted only when the flight overflies an agreed Coordination Point(COP). In all other cases a CPL is sent

10.1.2.6.2.4 *CDN (Coordination)* messages may be initiated by the controller to propose changes to the coordination conditions agreed to in a previously transmitted CPL, EST, PAC or CDN message. It must be noted that only one CDN dialogue can be active per flight at any given time between the same two ATSU's and CDN dialogues should be closed prior to the Transfer of Control occurring.

10.1.2.6.2.5 *PAC (Pre-activation)* is transmitted to inform the receiving ATS unit of the crossing conditions for a flight which has not yet departed and to indicate that the conditions are in compliance with agreements between the two parties. Normally it is only used when the departure point is closed to the common boundary and preflight coordination is required.

10.1.2.6.2.6 *MAC (Coordination Cancellation)* message is transmitted specifically to indicate to a receiving center that all notification and/or coordination received for a flight is no longer relevant to that center. This message is not to be considered as a cancellation (CNL) message of a FPL.

10.1.2.6.2.7 *ACP (acceptance)* is transmitted to confirm that the contents of areceicved CPL, CDN, EST, or PAC message are accepted. ACP may be generated automatically or manually in response to received EST or PAC message wheread an ACP message has to be generated by the controller manually in response to CPL or CDN message.

10.1.2.6.2.8 *REJ (Rejection)* is manually transmitted to reject a clearance proposed by a CDN to a previously coordinated flight and terminate the coordination dialogue. When CDN is rejected the clearance remains as was previously agreed. CPL, EST, or PAC messages cannot be rejected.

10.1.2.6.2.9 *TOC (Transfer of Control)* may be generated automatically or manually to offer the receiving ATS unit executive control of a flight.

10.1.2.6.2.10 *AOC (Assumption of Control)* may be generated automatically or manually in response to a TOC to indicated acceptance of executive control of a flight.

10.1.2.6.3 Application Response Messages

10.1.2.6.3.1 *LAM (Logical Acknowledge Message)* shall be transmitted automatically when the receiving automation system finds the received message to be syntactically correct and the message date is accepted for further processing or presentation. Otherwise an LRM (Logical Rejection Message) with error code shall be transmitted by the system. Every AIDC message received by an ATSU, except a LAM or LRM shall be responded to with a LAM or LRM.

10.1.2.6.3.2 Failure to receive an application response within the time out value (T_{alarm}) seconds from the original transmission of the message shall result in a warning LTO (Logical Time Out) being issued.

10.1.2.6.4 Operational Response Messages

10.1.2.6.4.1 Several ASIA/PAC AIDC message require a response in addition to the normal application response, by another AIDC message. Such a response is termed an Operational Response. Table 10-1 below indicates the required response to received message.

10.1.2.6.4.2 Failure to receive a response within an adapted operational response timeout period Top shall result in a warning CTO (Coordinated Time Out) being issued

Received Message	Required Operational Response
CPL	ACP or CDN
EST	ACP
PAC	ACP
CDN	ACP, CDN or REJ
TOC	AOC

Table 10-1: Required operational response messages

10.1.2.6.5 Other AIDC messages

10.1.2.6.5.1 The use of other AIDC message specified in the ASIA/PAC Regional ICD for AIDC will be reviewed after resolving interoperability issued in exchange of these messages between different ATM automation systems.

10.1.2.6.6 Message Handling

10.1.2.6.6.1 The automation system receiving an ABI sets the Flight Plan State to OPERATIVE, the Aircraft State to AIRBORNE and the Clearance State to CLEARED. The Flight strips are automatically printed based on the ABI and the surveillance track is correlated. Further changes to flight profile via ABI, CPL or EST messages automatically updates the FDE, FDL and Data Tag. If adapted, automatic reprinting of strips are done by the system otherwise the controller has to manually reprint or correct the strips. CDN messages are only proposal and flight profiles are updated only after an ACP is sent by the receiving controller.

10.1.2.6.7 Adaptation

10.1.2.6.7.1 The automation system should be adapted to provide for easy handling of AIDC messages. This should usually be achieved by some form of menu access for generating messages and by pop-up windows for replying to incoming messages. Wherever feasible menu access should be provided via the track label, FDE and FDL to generate outgoing AIDC message or view and reply to incoming messages.

10.1.2.6.7.2 Receipt of an operational response (ACP or REJ) should be indicated to the controller via FDE, FDL and Data Tag.

10.1.2.6.7.3 Failure to receive an expected Application or Operational response within an adapted time Top should provide an alert to the controller so that manual coordination can be performed.

10.1.2.6.8 Flight Plan Database Accuracy

10.1.2.6.8.1 The most common errors for receiving LRM (Logical Rejection

Messages) from external automation systems are:

a. Duplicate Flight Plan

b. Erroneous Flight Plan Data

c. Non-Availability of FPL

d. Incorrect FPL Format

e. Incorrect route and/or Boundary estimate

10.1.2.6.8.2 The accuracy of the flight plan database must be maintained at all times. Controllers and flight data officers must ensure that the flight plan information accurately represents the cleared route and level. It should be noted that Flight Planning messages will continue to play an important role even after the implementation of AIDC.

10.1.2.6.9 AIDC Training

10.1.2.6.9.1 The AIDC training may include the following:

a) Basic AIDC messaging rules, messaging errors, parameters and procedures for all ATCOs.

b) Additional training dealing with message errors and flight plan database management for Operational support Specialists (OSS/FDO).

c) On the adaptation capabilities and limitations for defining AIDC messaging conditions for Adaptation Team (DMS).

10.1.2.6.10 Letter of Agreement

10.1.2.6.10.1 Before implementing AIDC stations should amend their Letter of Agreement (LOA) to incorporate the following:

a. The routes and Coordination Points (COP)

b. Accountability and reuse Timer

c. AIDC Messages to be exchanged

d. AIDC failure and recovery procedures

e. Area of Common Interest

f. Variable System Parameters (VSP) for exchange of messages

10.1.3 Coordination between a unit providing area control service and a unit providing approach control service

10.1.3.1 Division of Control

10.1.3.1.1 Except when otherwise specified in letters of agreement or local instructions, or by the ACC concerned in individual cases, a unit providing approach control service may issue clearances to any aircraft released to it by an ACC without reference to the ACC. However, when an approach has been missed the ACC shall, if affected by the missed approach, be advised immediately and subsequent action coordinated between the ACC and the unit providing approach control service as necessary.

10.1.3.1.2 An ACC may, after coordination with the unit providing approach control service, release aircraft directly to aerodrome control towers if the entire approach will be made under visual meteorological conditions.

10.1.3.2 Take-off and Clearance Expiry Times

10.1.3.2.1 Time of take-off shall be specified by the ACC when it is necessary to:

a) coordinate the departure with traffic not released to the unit providing approach control service; and

b) provide en-route separation between departing aircraft following the same track.

10.1.3.2.2 If time of take-off is not specified, the unit providing approach control service shall determine the take-off time when necessary to coordinate the departure with traffic released to it.

10.1.3.2.3 A clearance expiry time shall be specified by the ACC if a delayed departure would conflict with traffic not released to the unit providing approach control service. If, for traffic reasons of its own, a unit providing approach control service has to specify in addition its own clearance expiry time, this shall not be later than that specified by the ACC.

10.1.3.3 Exchange of movement and control data

10.1.3.3.1 The unit providing approach control service shall keep the ACC promptly advised of pertinent data on controlled traffic such as:

a) runway(s)-in-use and expected type of instrument approach procedure;

b) lowest vacant level at the holding fix available for use by the ACC;

c) average time interval or distance between successive arrivals as determined by the unit providing approach control service;

d) revision of the expected approach time issued by the ACC when the calculation of the expected approach time by the unit providing approach control service indicates a variation of five minutes or such other time as has been agreed between the two ATC units concerned;

e) arrival times over the holding point when these vary by three minutes, or such other time as has been agreed between the two ATC units concerned, from those previously estimated;

f) cancellations by aircraft of IFR flight, if these will affect levels at the holding point or expected approach times of other aircraft;

g) aircraft departure times or, if agreed between the two ATC units concerned, the estimated time at the control area boundary or other specified point;

h) all available information relating to overdue or unreported aircraft;

i) missed approaches which may affect the ACC.

10.1.3.3.2 The ACC shall keep the unit providing approach control service promptly advised of pertinent data on controlled traffic such as:

a) identification, type and point of departure of arriving aircraft;

b) estimated time and proposed level of arriving aircraft over holding fix or other specified point;

c) estimated time and proposed level of arriving aircraft over holding fix or actual time and proposed level if aircraft is released to the unit providing approach control service after arrival over the holding point;

d) requested type of IFR approach procedure if different to that specified by the approach control unit;

e) expected approach time issued;

f) when required, statement that aircraft has been instructed to contact the unit providing approach control service;

g) when required, statement that an aircraft has been released to the unit providing approach control service including, if necessary, the time and conditions of release;

h) anticipated delay to departing traffic due to congestion.

10.1.3.3.3 Information on arriving aircraft shall be forwarded not less than fifteen minutes before estimated time of arrival and such information shall be revised as necessary.

10.1.4 Coordination between a unit providing approach control service and a unit providing aerodrome control service

10.1.4.1 Division of Control

10.1.4.1.1 A unit providing approach control service shall retain control of arriving aircraft until such aircraft have been transferred to the aerodrome control tower and are in communication with the aerodrome control tower. Letters of agreement or local instructions, appropriate to the airspace structure, terrain, meteorological conditions and ATS facilities available, shall establish rules for the transfer of arriving aircraft.

10.1.4.1.2 A unit providing approach control service may authorize an aerodrome control tower to release an aircraft for take-off subject to the discretion of the aerodrome control tower with respect to arriving aircraft.

10.1.4.1.3 Aerodrome control towers shall, when so prescribed in letters of agreement or local instructions, obtain approval from the unit providing approach control service prior to authorizing operation of special VFR flights.

10.1.4.2 Exchange of movement and control data

10.1.4.2.1 An aerodrome control tower shall keep the unit providing approach control service promptly advised of pertinent data on relevant controlled traffic such as:

a) arrival and departure times;

b) when required, statement that the first aircraft in an approach sequence is in communication with and is sighted by the aerodrome control tower, and that reasonable assurance exists that a landing can be accomplished;

c) all available information relating to overdue or unreported aircraft;

d) information concerning missed approaches;

e) information concerning aircraft that constitute essential local traffic to aircraft under the control of the unit providing approach control service.

10.1.4.2.2 The unit providing approach control service shall keep the aerodrome control tower promptly advised of pertinent data on controlled traffic such as:

a) estimated time and proposed level of arriving aircraft over the aerodrome, at least fifteen minutes prior to estimated arrival;

b) when required, a statement that an aircraft has been instructed to contact the aerodrome control tower and that control shall be assumed by that unit;

c) anticipated delay to departing traffic due to congestion.

10.1.5 Coordination between control positions within the same unit

10.1.5.1 Appropriate flight plan and control information shall be exchanged between control positions within the same air traffic control unit, in respect of:

a) all aircraft for which responsibility for control will be transferred from one control position to another;

b) aircraft operating in such close proximity to the boundary between control sectors that control of traffic within an adjacent sector may be affected;

c) all aircraft for which responsibility for control has been delegated by a controller using procedural methods to a controller using an ATS surveillance system, as well as other aircraft affected.

10.1.5.2 Procedures for coordination and transfer of control between control sectors within the same ATC unit shall conform to the procedures applicable to ATC units.

10.2 COORDINATION IN RESPECT OF THE PROVISION OF FLIGHT INFORMATION SERVICE AND ALERTING SERVICE

10.2.1 Coordination between ATS units providing flight information service in adjacent FIRs shall be effected in respect of IFR and VFR flights, in order to ensure continued flight information service to such aircraft in specified areas or along specified routes. Such coordination shall be effected in accordance with an agreement between the ATS units concerned.

10.2.2 Where coordination of flights is effected in accordance with 10.2.1, this shall include transmission of the following information on the flight concerned:

a) appropriate items of the current flight plan; and

b) the time at which last contact was made with the aircraft concerned.

10.2.3 This information shall be forwarded to the ATS unit in charge of the next FIR in which the aircraft will operate prior to the aircraft entering such FIR.

10.2.4 When so required by agreement between the appropriate ATS authorities to assist in the identification of strayed or unidentified aircraft and thereby eliminate or reduce the need for interception, flight plan and flight progress information for flights along specified routes or portions of routes in close proximity to FIR boundaries shall also be provided to the ATS units in charge of the FIRs adjacent to such routes or portions of routes.

10.2.5 In circumstances where an aircraft has declared minimum fuel, or is experiencing an emergency or in any other situation wherein the safety of the aircraft is not assured, the type of emergency and/or the circumstances experienced by the aircraft shall be reported by the transferring unit to the accepting unit and any other ATS unit that may be concerned with the flight and to the associated rescue coordination centres, if necessary.

10.3 COORDINATION IN RESPECT OF THE PROVISION OF AIR TRAFFIC ADVISORY SERVICE

10.3.1 ATS units providing air traffic advisory service shall apply the coordination procedures specified in Section 10.1 with respect to such aircraft having elected to use this type of service.

10.4 COORDINATION BETWEEN THE OPERATOR AND AIR TRAFFIC SERVICES

10.4.1 ATS units, in carrying out their objectives, shall have due regard for the requirements of the operators 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

10.4.2 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 contained in MATS Part-2.

10.5 COORDINATION BETWEEN MILITARY AUTHORITIES AND AIR TRAFFIC SERVICES

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

10.5.2 Coordination of activities potentially hazardous to civil aircraft shall be effected in accordance with 10.6.

10.5.3 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.

10.5.3.1 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.

10.5.3.2 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.

10.6 COORDINATION OF ACTIVITIES POTENTIALLY HAZARDOUS TO CIVIL AIRCRAFT

10.6.1 The arrangements for activities potentially hazardous to civil aircraft shall be coordinated by the organization conducting such activities with the AAI CHQ and / or local air traffic services unit(s) as appropriate. The coordination shall be effected early enough to permit timely promulgation of information regarding the activities.

10.6.2 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.

10.6.2.1 In determining these arrangements the following should be applied:

a) the locations or areas, times and durations for the activities should be selected to avoid closure or realignment of established ATS routes, blocking of the most economic flight levels, or delays of scheduled aircraft operations, unless no other options exist;

b) the size of the airspace designated for the conduct of the activities should be kept as small as possible;

c) direct communication between the appropriate air traffic services unit and the organization or unit conducting the activities should be provided for use in the event that civil aircraft emergencies or other unforeseen circumstances require discontinuation of the activities.

10.6.4 The AAI CHQ and / or local air traffic services unit(s) as appropriate shall be responsible for initiating the promulgation of information regarding such activities.

10.6.5 Information regarding activities potentially hazardous to civil aircraft taking place on a regular or continuing basis are published in AIP ENR 5. If required, special committees should be established to ensure that the requirements of all parties concerned are adequately coordinated.

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

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

Note 2.— See also Annex 14 — Aerodromes, *Volume I —* Aerodrome Design and Operations, *Chapter 5 section 5.3.1.2.*

10.6.7 Information regarding flexible use of airspace along some of the ATS routes reserved for military or other special activities is published in AIP ENR 3. Appropriate ATS unit shall affect necessary coordination with military / other concerned authorities to permit all airspace users to have safe access to such reserved airspace.

10.7 COORDINATION BETWEEN METEOROLOGICAL AND ATS AUTHORITIES

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

a) in addition to using indicating instruments, to report, if observed by air traffic services personnel or communicated by aircraft, such other meteorological elements as may be agreed upon;

b) to report as soon as possible to the associated meteorological office meteorological phenomena of operational significance, if observed by air traffic services personnel or communicated by aircraft, which have not been included in the aerodrome meteorological report;

c) to report as soon as possible to the associated meteorological office 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).

10.7.2 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.

10.8 COORDINATION BETWEEN AERONAUTICAL INFORMATION SERVICE (AIS) AND AIR TRAFFIC SERVICES (ATS) UNITS

10.8.1 To ensure that aeronautical information services units obtain information to enable them to provide up to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made locally between aeronautical information services and ATS units responsible for AIS to report to the responsible AIS unit, with a minimum of delay:

a) information on aerodrome conditions;

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

c) the occurrence of volcanic activity observed by air traffic services personnel or reported by a

d) any other information considered to be of operational significance.

10.8.2 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.

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

CHAPTER 11

AIR TRAFFIC SERVICES MESSAGES

11.1 Categories of messages

11.1.1 General

11.1.1.1 The messages listed below are authorized for transmission via the aeronautical fixed service (including the aeronautical telecommunication network (ATN) and the aeronautical fixed telecommunication network (AFTN), direct speech circuits or digital data interchange between ATS units, and direct teletypewriter and computer circuits), or via the aeronautical mobile service, as applicable. They are classified in categories relating to their use by the air traffic services and providing an approximate indication of their importance.

11.1.2 Emergency messages

11.1.2.1 This category comprises:

a) distress messages and distress traffic, including alerting messages relating to a distress phase (SS);
b) urgency messages, including alerting messages relating to an alert phase or to an uncertainty phase (DD);
c) other messages concerning known or suspected emergencies which do not fall under a) or b) above, and radio communication failure messages (FF or higher as required).

11.1.3 Movement and control messages

11.1.3.1 This category comprises:

a) movement messages (FF), including:
   - filed flight plan messages
   - delay messages
   - modification messages
   - flight plan cancellation messages
   - departure messages
   - arrival messages;

b) coordination messages (FF), including:
   - current flight plan messages
   - estimate messages
   - coordination messages
   - acceptance messages
   - logical acknowledgement messages;

c) supplementary messages (FF), including:

- request flight plan messages
- request supplementary flight plan messages
- supplementary flight plan messages;

d) AIDC (ATS inter-facility data communication) messages, including:

- notification messages
- coordination messages
- transfer of control messages
- application management messages;

e) control messages (FF), including:

- clearance messages
- flow control messages
- position report and air-report messages.

11.1.4 Flight information messages

This category comprises:

a) messages containing traffic information (FF);

b) messages containing meteorological information (FF or GG);

c) messages concerning the operation of aeronautical facilities (GG);

d) messages containing essential aerodrome information (GG);

e) messages concerning air traffic incident reports (FF).

11.1.5 When justified by the requirement for special handling, messages transmitted via the AFTN should be assigned the Priority Indicator DD in place of the normal Priority Indicator.

11.2 General provisions

Note.— The use in this Chapter of expressions such as "originated", "transmitted", "addressed" *or* "received" *does not necessarily imply that reference is made to a teletypewriter or digital data interchange for a computer-to-computer message. Except where specifically indicated, the messages described in this Chapter may also be transmitted by voice, in which case the four terms above represent "initiated", "spoken by", "spoken to" and "listened to" respectively.*

11.2.1 Origination and addressing of messages

11.2.1.1 <u>General</u>

Note.— Movement messages in this context comprise flight plan messages, departure messages, delay messages, arrival messages, cancellation messages and position report messages and modification messages relevant thereto.

11.2.1.1.1 Messages for ATS purposes shall be originated by the appropriate air traffic services units or by aircraft as specified in Section 11.3, except that, through special local arrangements, ATS units may delegate the responsibility for originating movement messages to the pilot, the operator, or its designated representative.

11.2.1.1.2 Origination of movement, control and flight information messages for purposes other than air traffic services (e.g. operational control) shall, except as provided for in section 10.4, Chapter 10 of this document, be the responsibility of the pilot, the operator, or a designated representative.

11.2.1.1.3 Flight plan messages, amendment messages related thereto and flight plan cancellation messages shall, except as provided in 11.2.1.1.4, be addressed only to those ATS units which are specified in the provisions of 11.4.2. Such messages shall be made available to other ATS units concerned, or to specified positions within such units and to any other addressees of the messages, in accordance with local arrangements.

11.2.1.1.4 When so requested by the operator concerned, emergency and movement messages which are to be transmitted simultaneously to ATS units concerned shall also be addressed to:

a) one addressee at the destination aerodrome or departure aerodrome, and
b) not more than two operational control units concerned,

such addressees to be specified by the operator or its designated representative.

11.2.1.1.5 When so requested by the operator concerned, movement messages transmitted progressively between ATS units concerned and relating to aircraft for which operational control service is provided by that operator shall, so far as practicable, be made available immediately to the operator or its designated representative in accordance with agreed local procedures.

11.2.1.2 *Use of the AFTN*

11.2.1.2.1 Air traffic services messages to be transmitted via the AFTN shall contain:

a) information in respect of the priority with which they are to be transmitted and the addressees to whom they are to be delivered, and an indication of the date and time at which they are filed with the aeronautical fixed station concerned and of the Originator Indicator (ref 11.2.1.2.5);

b) the air traffic services data, preceded if necessary by the supplementary address information described in 11.2.1.2.6, and prepared in accordance with Appendix 3 of PANS ATM DOC 4444. These data will be transmitted as the text of the AFTN message.

11.2.1.2.2 *Priority Indicator*

This shall consist of the appropriate two-letter Priority Indicator for the message as shown in parentheses for the appropriate category of message in Section 11.1.

Note.— The order of priority for the transmission of messages in the AFTN shall be as follows:

Transmission Priority	*Priority Indicator*
1	SS
2	DD FF
3	GG KK

Table 11-1: Order of priority for the transmission of messages in the AFTN

11.2.1.2.3 *Address*

11.2.1.2.3.1 This shall consist of a sequence of Addressee Indicators, one for each addressee to whom the message is to be delivered.

11.2.1.2.3.2 Each Addressee Indicator shall consist of an eight-letter sequence comprising, in the following order:

a) the ICAO four-letter Location Indicator assigned to the place of destination;

b) i) the ICAO three-letter designator identifying the aeronautical authority, service or aircraft operating agency addressed, or

ii) in cases where no designator has been assigned, one of the following:

- "YXY" in the case where the addressee is a military service/organization,
- "ZZZ" in the case where the addressee is an aircraft in flight,
- "YYY" in all other cases;

c) i) the letter X, or

ii) the one-letter designator identifying the department or division of the organization addressed.

11.2.1.2.3.3 The following three-letter designators shall be used when addressing ATS messages to ATS units:

a) Centre in charge of a Flight Information Region (Whether ACC or FIC):

i. if the message is relevant to an IFR flight: ZQZ

ii. if the message is relevant to a VFR flight: ZFZ

b) Aerodrome Control Tower: ZTZ

c) Air Traffic Services Reporting Office: ZPZ

Other three-letter designators for ATS units shall not be used for that purpose.

11.2.1.2.4 *Filing Time*

The filing time shall consist of a six-digit date-time group indicating the date and the time of filing the message for transmission with the aeronautical fixed station concerned.

11.2.1.2.5 *Originator Indicator*

The Originator Indicator shall consist of an eight-letter sequence, similar to an Addressee Indicator (ref 11.2.1.2.3.2), identifying the place of origin and the organization originating the message.

11.2.1.2.6 *Supplementary information on the address and the origin*

The following supplementary information is required when, in the Indicators of the Address and/or Origin, the three-letter designators "YXY", "ZZZ" or "YYY" (see 11.2.1.2.3.2 b) ii)) are used:

a) the name of the organization or the identity of the aircraft concerned is to appear at the beginning of the text;

b) the order of such insertions is to be the same as the order of the Addressee Indicators and/or the Originator Indicator;

c) where there are more than one such insertion, the last should be followed by the word "STOP";

d) where there are one or more insertions in respect of Addressee Indicators plus an insertion in respect of the Originator Indicator, the word "FROM" is to appear before that relating to the Originator Indicator.

Note.— Regarding ATS messages received in teletypewriter page-copy form:

1) ATS messages received via the AFTN will have been placed within a communications "envelope" (preceding and following character sequences which are necessary to ensure correct transmission via the AFTN). Even the text of the AFTN message may be received with words or groups preceding and following the ATS text.

2) The ATS message may then be located by the simple rule that it is preceded by an Open Bracket, e.g., '(' and followed by a Close Bracket, e.g., ')'.

3) In some local cases, the teletypewriter machines in use will always print two specific symbols other than Open Bracket and Close Bracket on receipt of ATS messages constructed as prescribed in Appendix 3 of PANS ATM DOC 4444. Such local variants are easily learned and are of no consequence.

11.2.2 Preparation and transmission of messages

11.2.2.1 Except as provided for in 11.2.2.2, ATS messages shall be prepared and transmitted with standard texts in a standard format and in accordance with standard data conventions, as and when prescribed in Appendix 3 of PANS ATM DOC 4444.

11.2.2.2 Where appropriate, the messages prescribed in Appendix 3 of PANS-ATM DOC 4444 shall be supplemented with, and/or replaced by, AIDC messages prescribed in Appendix 6 of PANS ATM DOC 4444, on the basis of regional air navigation agreement.

11.2.2.2.1 Where AIDC messages are transmitted via the ATN, the messages shall utilize the packed encoding rules using abstract syntax notation one (ASN.1).

Note.- Provisions and information on the ANS.1 packed encoding rules and AIDC addressing rules are contained in Annex 10, Volume II, Part I and the Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN) (Doc 9705). Guidance material concerning the operational use of AIDC messages is contained in Manual of Air Traffic Services Data Link Applications (Doc 9694).

11.2.2.2.2 Where AIDC messages are transmitted via the AFTN, the format for the AIDC messages shall, as far as practicable, comply with the appropriate data conventions contained in Appendix 3 of PANS ATM DOC 4444, shall be provided for on the basis of regional air navigation agreement.

11.2.2.3 When messages are exchanged orally between the relevant ATS units, an oral acknowledgement shall constitute evidence of receipt of the message. No confirmation in written form directly between controllers shall therefore be required. The confirmation of coordination via the exchange of messages between automated systems shall be required unless special arrangement have been made between the units concerned.

11.3 Methods of message exchange

11.3.1 The lead-time requirements of air traffic control and flow control procedures shall determine the method of message exchange to be used for the exchange of ATS data.

11.3.1.1 The method of message exchange shall also be dependent upon the availability of adequate communications channels, the function to be performed, the types of data to be exchanged and the processing facilities at the centres concerned.

11.3.2 Basic flight plan data necessary for flow control procedures shall be furnished at least 60 minutes in advance of the flight. Basic flight plan data shall be provided by either a filed flight plan or a repetitive flight plan submitted by mail in the form of a repetitive flight plan listing form or other media suitable for electronic data processing systems.

11.3.2.1 Flight plan data submitted in advance of flight shall be updated by time, level and route changes and other essential information as may be necessary.

11.3.3 Basic flight plan data necessary for air traffic control purposes shall be furnished to the first en-route control centre at least 30 minutes in advance of the flight, and to each successive centre at least 20 minutes before the aircraft enters that centre's area of jurisdiction, in order for it to prepare for the transfer of control.

11.3.4 Except as provided for in 11.3.5, the second en-route centre and each successive centre shall be provided with current data, including updated basic flight plan data, contained in a current flight plan message or in an estimate message supplementing already available updated basic flight plan data.

11.3.5 In areas where automated systems are utilized for the exchange of flight plan data and where these systems provide data for several ACCs, approach control units and/or aerodrome control towers, the appropriate messages shall not be addressed to each individual ATS unit, but only to these automated systems.

Note.— Further processing and distribution of the data to its associated ATS units is the internal task of the receiving system.

11.3.5.1 When AIDC messages are used, the sending unit shall determine the identity of the receiving ATS unit and all messages shall contain the identification of the next ATS unit. The receiving unit shall only accept messages intended for it.

11.3.6 **Movement messages**

Movement messages shall be addressed simultaneously to the first en-route control centre, to all other ATS units along the route of flight which are unable to obtain or process current flight plan data, and to air traffic flow management units concerned.

11.3.7 **Coordination and transfer data**

11.3.7.1 Progression of a flight between successive control sectors and/or control centres shall be effected by a coordination and transfer dialogue comprising the following stages:

a) notification of the flight in order to prepare for coordination as necessary;
b) coordination of conditions of transfer of control by transferring ATC unit;
c) coordination, if necessary, and acceptance of conditions of transfer of control by the accepting ATC unit; and
d) the transfer of control to the accepting unit.

11.3.7.2 Except as provided for in 11.3.7.3, the notification of the flight shall be by a current flight plan message containing all relevant ATS data or by an estimate message containing the proposed conditions of transfer. An estimate message shall be used only when updated basic flight plan data is already available at the receiving unit, i.e. a filed flight plan message and associated update message(s) have already been sent by the transferring unit.

11.3.7.3 Where AIDC messages are used, the notification of the flight shall be via a Notification message and/or Coordination Initial message containing all relevant ATS data.

11.3.7.4 Except as provided for in 11.3.7.5, the coordination dialogue shall be considered to be completed as soon as the proposed conditions contained in the current flight plan message, or in the estimate message or in one or more counter-proposals, are accepted by an operational or logical procedure.

11.3.7.5 Where AIDC messages are used, any coordination dialogue shall be considered to be completed as soon as the Coordinate Initial message or a counter proposal (Coordinate Negotiate message) has been accepted.

11.3.7.6 Except as provided for in 11.3.7.7, unless an operational acknowledgement is received, a Logical Acknowledgement message shall be automatically transmitted by the receiving computer in order to ensure the integrity of the coordination dialogue employing computer-to-computer links. This message shall be transmitted when the transfer data has been received and processed to the point that, it is considered free of syntactic and semantic errors, i.e. the message contains valid information.

11.3.7.7 Where AIDC messages are used, an Application Accept message shall be automatically transmitted by the receiving computer in order to ensure the integrity of the coordination dialogue employing computer-to-computer links. This message shall be transmitted when the coordination, general information or transfer data has been received, processed and found free of errors and, where relevant, is available for presentation at the control position.

11.3.7.8 The transfer of control shall be either explicit or, by agreement between the two units concerned, implicit, i.e. no communication need be exchanged between the transferring and accepting units.

11.3.7.9 When the transfer of control involves exchange of data, the proposal for transfer shall include information derived from an ATS surveillance system, if appropriate. Since the proposal relates to previously accepted coordination data, further coordination shall normally not be required. However, acceptance of the proposed transfer conditions shall be required.

11.3.7.10 In situations where the proposed transfer conditions are no longer acceptable to the accepting unit, further coordination shall be initiated by the accepting unit by proposing alternative acceptable conditions.

11.3.7.11 Transfer of communication messages may be used as an alternative to Transfer of Control messages. If Transfer of communication messages are used to instruct a flight to establish communication with the receiving unit and the transfer of control will take place at the control area boundary, or such other time or place, specified in letters of agreement, Transfer of control messages need not be used.

11.3.7.12 If, after receipt of information derived from an ATS surveillance system, the accepting centre is unable to identify the aircraft immediately, additional communication shall ensue to obtain new surveillance information, if appropriate.

11.3.7.13 When control of the transferred aircraft has been assumed, the accepting unit shall complete the transfer of control dialogue by communicating assumption of control to the transferring unit, unless special arrangements have been made between the units concerned.

11.3.8 **Supplementary data**

11.3.8.1 When basic flight plan data or supplementary flight plan data are required, request messages shall be addressed to the ATS unit which is most likely to have access to the required data.

Note.— See 11.4.2.4.2 and 11.4.2.4.3 for ATS units to which request messages shall be addressed.

1.3.8.2 If the requested information is available, a filed or a supplementary flight plan message shall be transmitted.

11.4 Message types and their application

11.4.1 Emergency messages

11.4.1.1 The various circumstances surrounding each known or suspected emergency situation preclude the specification of standard message types to provide for emergency communications, except as described in 11.4.1.2, 11.4.1.3 and 11.4.1.4.

11.4.1.2 *Alerting (ALR) Messages*

11.4.1.2.1 When an ATS unit considers that an aircraft is in a state of emergency as defined in Chapter 9 of this document, an alerting message shall be transmitted to any ATS unit that may be concerned with the flight and to the associated rescue coordination centres, containing such of the information specified in Appendix 3, Section 1, of PANS-ATM DOC 4444 as is available or can be obtained.

11.4.1.2.2 When so agreed between the ATS units concerned, a communication relating to an emergency phase and originated by a unit employing automatic data-processing equipment may take the form of a modification message (as in 11.4.2.2.4) or a coordination message (as in 11.4.2.3.4 or 11.4.2.4.4, supplemented by a verbal message giving the additional details prescribed for inclusion in an alerting message.

11.4.1.3 *Radio communication Failure (RCF) Messages*

Note.— Provisions governing the action to be taken in the event of radio communication failure are set forth in Chapter 15, Section 15.3 of this document.

11.4.1.3.1 When an ATS unit is aware that an aircraft in its area is experiencing radio communication failure, an RCF message shall be transmitted to all subsequent ATS units along the route of flight which have already received basic flight plan data (FPL or RPL) and to the aerodrome control tower at the destination aerodrome, if basic flight plan data has been previously sent.

11.4.1.3.2 If the next ATS unit has not yet received basic flight plan data because it would receive a current flight plan message in the coordination procedure, then an RCF message and a current flight plan (CPL) message shall be transmitted to this ATS unit. In turn, this ATS unit shall transmit an RCF message and a CPL message to the next ATS unit.

11.4.1.4 Free Text Emergency Messages (AIDC)

11.4.1.4.1 Whenever operational information needs to be transmitted concerning an aircraft known or believed to be in a state of emergency and the information cannot formatted to comply with any other AIDC message type, a free text emergency message shall be sent.

11.4.1.4.2 The following are some examples of circumstances which could justify the use of a Free text emergency message:

a) reports of emergency calls or emergency locator transmission reports;

b) messages concerning unlawful interference or bomb warnings;

c) messages concerning serious illness or disturbance among passengers;

d) sudden alteration in flight profile due to technical or navigational failure; and

e) communication failure.

11.4.2 Movement and control messages

11.4.2.1 Messages concerning the intended or actual movement of aircraft shall be based on the latest information furnished to ATS units by the pilot, the operator or its designated representative, or derived from ATS surveillance system.

11.4.2.2 *Movement messages*

11.4.2.2.1 Movement messages comprise:

- filed flight plan messages
- delay messages
- modification messages
- flight plan cancellation messages
- departure messages
- arrival messages

11.4.2.2.2 *Filed Flight Plan (FPL) Messages*

11.4.2.2.2.1 Unless repetitive flight plan procedures are being applied or current flight plan messages are being employed, filed flight plan messages shall be transmitted for all flights for which a flight plan has been submitted with the object of being provided with air traffic control service, flight information service or alerting service along part or the whole of the route of flight.

11.4.2.2.2.2 A filed flight plan message shall be originated and addressed as follows by the ATS unit serving the departure aerodrome or, when applicable, by the ATS unit receiving a flight plan from an aircraft in flight:

a) an FPL message shall be sent to the ACC or flight information centre serving the control area or FIR within which the departure aerodrome is situated;

b) unless basic flight plan data are already available as a result of arrangements made for repetitive flight plans, an FPL message shall be sent to all centres in charge of each FIR or upper FIR along the route which are unable to process current data. In addition, an FPL message shall be sent to the aerodrome control tower at the destination aerodrome. If so required, an FPL message shall also be sent to flow management centres responsible for ATS units along the route;

c) when a potential re-clearance in flight (RIF) request is indicated in the flight plan, the FPL message shall be sent to the additional centres concerned and to the aerodrome control tower of the revised destination aerodrome;

d) where it has been agreed to use CPL messages but where information is required for early planning of traffic flow, an FPL message shall be transmitted to the ACCs concerned;

e) for a flight along routes where flight information service and alerting service only are provided, an FPL message shall be addressed to the centre in charge of each FIR or upper FIR along the route and to the aerodrome control tower at the destination aerodrome.

11.4.2.2.2.3 In the case of a flight through intermediate stops, where flight plans for each stage of the flight are filed at the first departure aerodrome, the following procedure shall be applied:

a) the air traffic services reporting office at the first departure aerodrome shall:

1) transmit an FPL message for the first stage of flight in accordance with 11.4.2.2.2.2;

2) transmit a separate FPL message for each subsequent stage of flight, addressed to the air traffic services reporting office at the appropriate subsequent departure aerodrome;

b) the air traffic services reporting office at each subsequent departure aerodrome shall take action on receipt of the FPL message as if the flight plan has been filed locally.

11.4.2.2.2.4 When so required by agreement between the appropriate ATS authorities to assist in the identification of flights and thereby eliminate or reduce the need for interceptions in the event of deviations from assigned track, FPL messages for flights along specified routes or portions of routes in close proximity to FIR boundaries shall also be addressed to the centres in charge of each FIR or upper FIR adjacent to such routes or portions of routes.

11.4.2.2.2.5 FPL messages should be transmitted immediately after the filing of the flight plan. If a flight plan is filed more than 24 hours in advance of the estimated off-block time of the flight to which it refers, the date of the flight departure shall be inserted in Item 18 of the flight plan.

11.4.2.2.3 *Delay (DLA) Messages*

11.4.2.2.3.1 A DLA message shall be transmitted when the departure of an aircraft, for which basic flight plan data (FPL or RPL) has been sent, is delayed by more than 30 minutes after the estimated off-block time contained in the basic flight plan data.

11.4.2.2.3.2 The DLA message shall be transmitted by the ATS unit serving the departure aerodrome to all recipients of basic flight plan data.

Note.— Ref 11.4.2.3.4 concerning notification of a delayed departure of an aircraft for which a CPL message has been transmitted.

11.4.2.2.4 *Modification (CHG) Messages*

11.4.2.2.4.1 A CHG message shall be transmitted when any change is to be made to basic flight plan data contained in previously transmitted FPL or RPL data. The CHG message shall be sent to those recipients of basic flight plan data which are affected by the change.

Note.— Ref 11.4.2.3.4 concerning notification of a change to coordination data contained in a previously transmitted current flight plan or estimate message.

11.4.2.2.5 *Flight Plan Cancellation (CNL) Messages*

11.4.2.2.5.1 A flight plan cancellation (CNL) message shall be transmitted when a flight, for which basic flight plan data has been previously distributed, has been cancelled. The ATS unit serving the departure aerodrome shall transmit the CNL message to ATS units which have received basic flight plan data.

11.4.2.2.6 *Departure (DEP) Messages*

11.4.2.2.6.1 A DEP message shall be transmitted immediately after the departure of an aircraft for which basic flight plan data have been previously distributed.

11.4.2.2.6.2 The DEP message shall be transmitted by the ATS unit serving the departure aerodrome to all recipients of basic flight plan data.

Note.— Refer 11.4.2.3.4 concerning notification of the departure of an aircraft for which a CPL message has been transmitted.

11.4.2.2.7 *Arrival (ARR) Messages*

11.4.2.2.7.1 When an arrival report is received by the ATS unit serving the arrival aerodrome, this unit shall transmit an ARR message:

a) for a landing at the destination aerodrome:

   i) to the ACC or flight information centre in whose area the arrival aerodrome is located, if required by that unit; and

   ii) to the ATS unit, at the departure aerodrome, which originated the flight plan message, if that message included a request for an ARR message;

b) or a landing at an alternate or other aerodrome:

   i) to the ACC or flight information centre in whose area the arrival aerodrome is located; and

   ii) to the aerodrome control tower at the destination aerodrome; and

   iii) to the air traffic services reporting office at the departure aerodrome; and

   iv) to the ACC or flight information centre in charge of each FIR or upper FIR through which the aircraft would have passed according to the flight plan, had it not diverted.

11.4.2.2.7.2 When a controlled flight which has experienced failure of two-way communication has landed, the aerodrome control tower at the arrival aerodrome shall transmit an ARR message:

a) for a landing at the destination aerodrome:

   i) to all air traffic services units concerned with the flight during the period of the communication failure; and

   ii) to all other air traffic services units which may have been alerted;

b) for a landing at an aerodrome other than the destination aerodrome: to the ATS unit serving the destination aerodrome; this unit shall then transmit an ARR message to other ATS units concerned or alerted as in a) above.

11.4.2.3 Coordination Messages

Note.— The provisions governing coordination are contained in Chapter 10. Phraseology to be used in voice communication is contained in Chapter 12.

11.4.2.3.1 Coordination messages comprise:

- current flight plan messages
- estimate messages
- coordination messages
- acceptance messages
- logical acknowledgement messages

11.4.2.3.2 Current Flight Plan (CPL) Messages

11.4.2.3.2.1 Unless basic flight plan data have already been distributed (FPL or RPL) which will be supplemented by coordination data in the estimate message, a CPL message shall be transmitted by each ACC to the next ACC and from the last ACC to the aerodrome control tower at the destination aerodrome, for each controlled flight, and for each flight provided with air traffic advisory service along routes or portions of routes where it has been prescribed in Letter Of Agreement / MATS- Part 2 and where adequate point-to-point communications exist and that conditions are otherwise suitable for forwarding current flight plan information.

11.4.2.3.2.2 When an aircraft traverses a very limited portion of a control area where, by agreement between the appropriate ATS authorities concerned, coordination of air traffic through that portion of the control area has been delegated to and is effected directly by the two centres whose control areas are separated by that portion, CPLs shall be transmitted directly between such units.

11.4.2.3.2.3 A CPL message shall be transmitted in sufficient time to permit each ATS unit concerned to receive the information at least 20 minutes before the time at which the aircraft is estimated to pass the transfer of control point or boundary point at which it comes under the control of such unit, unless another period of time has been prescribed in LOA / MATS- Part 2. This procedure shall apply whether or not the ATS unit responsible for origination of the message has assumed control of, or established contact with, the aircraft by the time the transmission is to be effected.

11.4.2.3.2.4 When a CPL message is transmitted to a centre which is not using automatic data processing equipment, the period of time specified in 11.4.2.3.2.3 may be insufficient, in which case an increased lead-time shall be agreed.

11.4.2.3.2.5 A CPL message shall include only information concerning the flight from the point of entry into the next control area or advisory airspace to the destination aerodrome.

11.4.2.3.3 *Estimate (EST) Messages*

11.4.2.3.3.1 When basic flight plan data for a flight has been provided, an EST message shall be transmitted by each ACC or flight information centre to the next ACC or flight information centre along the route of flight.

11.4.2.3.3.2 An EST message shall be transmitted in sufficient time to permit the ATS unit concerned to receive the information at least 20 minutes before the time at which the aircraft is estimated to pass the transfer of control point or boundary point at which it comes under the control of such unit, unless another period of time has been prescribed in LOA / MATS- Part 2. This procedure shall apply whether or not the ACC or flight information centre responsible for origination of the message has assumed control of, or established contact with, the aircraft by the time the transmission is to be effected.

11.4.2.3.3.3 When an EST message is transmitted to a centre which is not using automatic data processing equipment, the period of time specified in 11.4.2.3.3.2 may be insufficient, in which case an increased lead-time shall be agreed.

11.4.2.3.4 *Coordination (CDN) Messages*

11.4.2.3.4.1 A CDN message shall be transmitted during the coordination dialogue by an accepting unit to the transferring unit when the former wishes to propose a change to coordination data as contained in a previously received CPL or EST message.

11.4.2.3.4.2 If the transferring unit wishes to propose a change to the data contained in a CDN message received from the accepting unit, a CDN message shall be transmitted to the accepting unit.

11.4.2.3.4.3 The dialogue described above is repeated until the coordination process is completed by the transmission of an acceptance (ACP) message by one of the two units concerned. Normally, however, when a change is proposed to a CDN message, direct-speech circuits shall be used to resolve this issue.

11.4.2.3.4.4 After the coordination dialogue has been completed, if one of the two ATS units concerned wishes to propose or notify any change in basic flight plan data or conditions of transfer, a CDN message shall be transmitted to the other unit. This requires that the coordination dialogue be repeated.

11.4.2.3.4.5 A repeated coordination process requires to be completed by the transmission of an ACP message. Normally, in a repeated coordination process, direct-speech circuits shall be used.

11.4.2.3.5 *Acceptance (ACP) message*

11.4.2.3.5.1 Unless special arrangements have been made between the air traffic control units concerned in accordance with Chapter 10, 10.1.2.3.1 an ACP message shall be transmitted by an accepting unit to the transferring unit to indicate that data in a CPL or an EST message is accepted.

11.4.2.3.5.2 Either the accepting unit or the transferring unit shall transmit an ACP message to indicate that data received in a CDN message is accepted and that the coordination dialogue is completed.

11.4.2.3.6 *Logical Acknowledgement Messages (LAM)*

11.4.2.3.6.1 An LAM shall be used only between ATC computers.

11.4.2.3.6.2 An ATC computer shall transmit an LAM in response to a CPL or EST or other appropriate message which is received and processed up to the point where the operational content will be received by the appropriate controller.

11.4.2.3.6.3 The transferring centre shall set an appropriate reaction time parameter when the CPL or EST message is transmitted. If the LAM is not received within the parameter time, an operational warning shall be initiated and reversion to telephone and manual mode shall ensue.

11.4.2.4 *Supplementary messages*

11.4.2.4.1 Supplementary messages comprise:

- request flight plan messages
- request supplementary flight plan messages
- supplementary flight plan messages

11.4.2.4.2 *Request flight plan (RQP) messages*

11.4.2.4.2.1 A request flight plan (RQP) message shall be transmitted when an ATS unit wishes to obtain flight plan data. This might occur upon receipt of a message concerning an aircraft for which no corresponding basic flight plan data had been previously received. The RQP message shall be transmitted to the transferring ATS unit which originated an EST message, or to the centre which originated an update message for which no corresponding basic flight plan data are available. If no message has been received at all, but an aircraft establishes radiotelephony (RTF) communications and requires air traffic services, the RQP message shall be transmitted to the previous ATS unit along the route of flight.

11.4.2.4.3 *Request supplementary flight plan (RQS) messages*

11.4.2.4.3.1 A request supplementary flight plan (RQS) message shall be transmitted when an ATS unit wishes to obtain supplementary flight plan data. The message shall be transmitted to the air traffic services reporting office at the departure aerodrome or in the case of a flight plan submitted during flight, to the ATS unit specified in the flight plan message.

11.4.2.4.4 *Supplementary flight plan (SPL) messages*

11.4.2.4.4.1 An SPL message shall be transmitted by the air traffic services reporting office at the departure aerodrome to air traffic services units requesting information additional to that already transmitted in a CPL or FPL message. When transmitted by the AFTN, the message shall be assigned the same priority indicator as that in the request message.

11.4.2.5 *AIDC Messages (Refer Appendix 6, DOC 4444)*

11.4.2.5.1 AIDC messages comprise:

- Notify messages
- Coordinate Initial messages
- Coordinate Negotiate messages
- Coordinate Accept messages
- Coordinate Reject messages
- Coordinate Cancel messages
- Coordinate Update messages
- Coordinate Standby messages
- Transfer Initiate
- Transfer Conditions Proposal
- Transfer Conditions Accept
- Transfer Communication Request
- Transfer Communication
- Transfer Communication Assume
- Transfer Control
- Transfer Control Assume
- General Point Messages
- General Executive Data messages
- Free Text Emergency messages
- Free Text General messages
- Application Accept messages
- Application Reject messages

11.4.2.5.2 The requirements with regard to the selection of AIDC messages and the associated procedures should be established on the basis of regional air navigation agreements in order to facilitate the harmonization of ATS in adjacent airspaces.

Note.— Whilst the implementation of AIDC messages is intended to automate the ATC coordination process, and minimise the requirement for voice coordination, it is not a complete replacement for voice, especially when a flight is in close proximity to the boundary with an adjoining unit.

11.4.2.5.3 <u>Notify messages</u>

11.4.2.5.3.1 Notify messages shall be transmitted in advance to the ATS unit(s) for which coordination for the flight will be required. This could include ATS units that may be affected by the flights' trajectory even though the flight may not actually enter these ATS units' airspace. The initial Notify message shall be sent at or prior to an agreed time or distance before the common boundary with the receiving unit. This time or distance shall normally occur prior to the transmission of the initial coordination message. If an aircraft is departing an aerodrome close to the common boundary, however, adjacent units may agree that no Notify message is required and that a Coordinate Initial message will suffice.

11.4.2.5.3.2 All Notify messages shall include *Boundary estimate data*. *Route data*, when included, shall as a minimum contain information from a point prior to entry into the receiving unit to the destination aerodrome.

Note 1.— The amount of route information prior to the point of entry into the receiving units' airspace depends on the environment of the flight. Typically, more route information would be required in a procedural environment.

Note 2.— To permit the synchronization of flight data information with adjacent units, the initial Notify message may contain all flight plan data associated with the flight.

11.4.2.5.3.3 Prior to the transmission of the Coordinate Initial message, amendments to the contents of a previously transmitted Notify message shall be communicated by transmission of another Notify message containing the amended data. Amendments to the level, route or destination aerodrome may also necessitate a change to the ATS units to which the new Notify message is sent.

11.4.2.5.3.4 If the destination of an aircraft is amended prior to the transmission of the initial Notify message, the *Destination aerodrome* in the Notify message shall contain the amended destination. If the destination is amended after the transmission of the initial Notify message but prior to the transmission of the Coordinate Initial message, a new Notify message shall be transmitted containing the original destination in the *Destination aerodrome* data, and the new destination as the amended destination. Subsequent AIDC messages to the same unit shall only contain the amended destination in the *Destination aerodrome* data.

11.4.2.5.3.5 There is no operational response to a Notify message.

11.4.2.5.4 <u>*Coordinate Initial messages*</u>

11.4.2.5.4.1 A Coordinate Initial message shall be transmitted by each area control centre to the next area control centre and from the last area control centre to the approach control unit serving the destination aerodrome (or aerodrome control if such a unit does not exist), for each controlled flight, and for each flight provided with air traffic advisory service, along routes or portions of routes where it has been determined by the appropriate ATS authority that conditions are suitable for forwarding coordination information. This may include ATS units that will be affected by the flights trajectory even though the flight may not actually enter these ATS units' airspace.

11.4.2.5.4.2 The Coordinate Initial message constitutes a proposal for coordination of a flight in accordance with the information contained in the coordination message and any previously received notification message(s) (if applicable). All Coordinate Initial messages shall include *Boundary estimate data*. *Route data*, when included, shall as a minimum contain information from a point prior to entry into the next unit to the destination aerodrome.

Note 1.— The amount of route information prior to the point of entry into the receiving ATS units' airspace depends on the environment of the flight. Typically, more route information would be required in a procedural environment.

Note 2.— To permit the synchronization of flight data information with adjacent units if a Notify message has not been previously transmitted, the Coordinate Initial message may contain all flight plan data associated with the flight.

11.4.2.5.4.3 When an aircraft traverses a very limited portion of a control area where, by agreement between the appropriate ATS authorities, coordination of air traffic through that portion of the control area has been delegated to, and is effected directly between, the two units whose control areas are separated by that portion, Coordinate Initial messages shall be transmitted directly between such units, in addition to the ATS unit whose airspace is being traversed.

11.4.2.5.4.4 A Coordinate Initial message shall be transmitted in sufficient time to permit each ATS unit concerned to receive the information at least 20 minutes before the time at which the aircraft is estimated to pass the transfer of control point or boundary point with the receiving unit, unless another period of time has been prescribed by the appropriate ATS authority. This requirement shall apply whether or not the ATS unit responsible for origination of the Coordinate Initial message has assumed control of, or established contact with, the aircraft by the time the coordination is to be effected.

11.4.2.5.4.5 When a Coordinate Initial message is transmitted to an ATS unit which is not using automatic data processing equipment, the period of time specified in 11.4.2.5.4.4 may be insufficient, in which case an increased time parameter may be agreed upon.

11.4.2.5.4.6 The standard responses to a Coordinate Initial message are either a Coordinate Negotiate or a Coordinate Accept message. However, if a Coordinate Initial message is received proposing non-standard coordination conditions and the Coordinate Negotiate message is not an appropriate response, the Coordinate Reject message may be used to reject the Coordinate Initial message. If this occurs, local procedures shall prescribe the requirements to complete the coordination process.

11.4.2.5.5 *Coordinate Negotiate messages*

11.4.2.5.5.1 A Coordinate Negotiate message shall be transmitted by the receiving unit to the transferring unit during the initial coordination dialogue when the receiving unit wishes to propose an amendment to the coordination conditions contained in the Coordinate Initial message.

11.4.2.5.5.2 Normally, when further negotiation is required in response to a Coordinate Negotiate message received during the initial coordination dialogue, direct speech circuits shall be used to resolve the issue. However, where so agreed between the two units, a Coordinate Negotiate message shall be transmitted in response. This message exchange is repeated until the coordination dialogue is completed by the transmission of a Coordinate Accept message by one of the units.

11.4.2.5.5.3 A Coordinate Negotiate message shall be transmitted after successful completion of coordination by either the transferring or receiving unit to propose an amendment to the previously agreed coordination conditions. The Coordinate Negotiate message is sent if the amendments are not in accordance with letters of agreement between the transferring and receiving units, or if Coordinate Update messages are not in use.

11.4.2.5.5.4 A Coordinate Negotiate message would not normally be transmitted after the transition to the Transfer state has commenced. However, where so agreed between ATS units, a Coordinate Negotiate message shall be transmitted by the receiving ATS unit to propose a modification to the flight details after the transfer of control of the flight has been completed, but when the flight is still within proximity of the boundary between the two ATS units.

11.4.2.5.5.5 Normally, when a further change is required in response to a Coordinate Negotiate message received after the initial coordination has been successfully completed, direct speech circuits shall be used to resolve the issue. However, where so agreed between ATS units, a Coordinate Negotiate message may be transmitted in response. This message exchange is repeated until the negotiation dialogue is completed by the transmission of either a Coordinate Accept or Coordinate Reject message by one of the units.

11.4.2.5.5.6 If a Coordinate Negotiate message is used to propose an amendment to the destination aerodrome, the Coordinate Negotiate message shall contain the original destination in them *Destination aerodrome* data, and the new destination as the amended destination. The operational response to this Coordinate Negotiate message shall also contain the original destination in the *Destination aerodrome* data. Provided that the amendment is accepted, subsequent AIDC messages to the same unit shall only refer to the amended destination in the *Destination aerodrome* data.

11.4.2.5.5.7 All Coordinate Negotiate messages shall contain *Boundary estimate data*. When agreed between the two units, a Coordinate Negotiate message shall be sent to update other flight plan data such as *CNS equipment* and *Other information*. *Route data*, when included due to a new route needing to be coordinated, shall as a minimum contain information from a point prior to entry into the next unit to the point where the new route rejoins the previously coordinated route.

11.4.2.5.5.8 A Coordinate Negotiate message would normally be presented to the controller for manual processing.

11.4.2.5.6 *Coordinate Accept messages*

11.4.2.5.6.1 A Coordinate Accept message shall be transmitted by the ATS unit receiving a Coordinate Initial, Coordinate Update or Coordinate Negotiate message to indicate that the proposed coordination conditions (or revision thereto) contained in the received message are accepted.

11.4.2.5.6.2 When a Coordinate Accept message is transmitted in response to a negotiation dialogue proposing an amendment to the destination aerodrome, the Coordinate Accept message may (optionally) contain the previous destination in the *Destination aerodrome* data.

Note.— The use of the previous destination in the Destination aerodrome *data of the Coordinate Accept message may be required to ensure the proper association with the Coordinate Negotiate message proposing the amendment of the destination aerodrome.*

11.4.2.5.6.3 The Coordinate Accept message terminates the coordination or negotiation dialogue. There is no operational response to a Coordinate Accept message.

11.4.2.5.7 *Coordinate Reject messages*

11.4.2.5.7.1 When agreed between the two units, a Coordinate Reject message may be used to reject the coordination conditions proposed in a Coordinate Initial message if these coordination conditions are not in accordance with letters of agreement. The Coordinate Reject message may only be used as a response to a Coordinate Initial message provided that local procedures exist to complete the coordination of the flight.

11.4.2.5.7.2 A Coordinate Reject message shall be transmitted by the ATS unit receiving a Coordinate Update or Coordinate Negotiate message to indicate that the proposed revision to coordination conditions contained in the received message are not acceptable, and that no counter-proposal will be made by the use of a Coordinate Negotiate message.

11.4.2.5.7.3 When a Coordinate Reject message is transmitted in response to a negotiation dialogue proposing an amendment to the destination aerodrome, the Coordinate Reject message may (optionally) contain the previous destination in the *Destination aerodrome* data.

Note.— The use of the previous destination in the Destination aerodrome *data of the Coordinate Reject message may be required to ensure the proper association with the Coordinate Negotiate message proposing the amendment of the destination aerodrome.*

11.4.2.5.7.4 A Coordinate Reject message terminates the coordination or negotiation dialogue. If the Coordinate Reject was a response to a negotiation dialogue after coordination had been completed, any previously agreed coordination conditions remain valid. There is no operational response to a Coordinate Reject message.

11.4.2.5.8 *Coordinate Cancel messages*

11.4.2.5.8.1 A Coordinate Cancel message shall be transmitted by the transferring unit to the receiving unit to abrogate the existing notification or coordination of a flight in the event that it is delayed indefinitely or the route or level is amended such that the flight is no longer expected to enter the airspace of the receiving unit directly from that of the transferring unit. If the amendments to the route or level of the flight are such that it will now affect another unit the transmission of an initial Notify message and/or Coordinate Initial message to that unit may be required.

11.4.2.5.8.2 The Coordinate Cancel message may include information regarding the reason for the cancellation. This information is defined in the *Manual of Air Traffic Services Data Link Applications* (Doc 9694).

11.4.2.5.8.3 There is no operational response to a Coordinate Cancel message.

11.4.2.5.9 *Coordinate Update messages*

11.4.2.5.9.1 A Coordinate Update message shall be transmitted by the transferring unit to the receiving unit to propose an amendment to the previously agreed coordination conditions, provided that the proposed amendment is in accordance with letters of agreement. If the amendment is not in accordance with letters of agreement, a Coordinate Negotiate message shall be used instead. A Coordinate Update message shall not be transmitted before coordination has been successfully completed, or after the transition to the transfer state has commenced.

11.4.2.5.9.2 If the flight is greater than an agreed time or distance prior to the boundary, amendments contained in a Coordinate Update message are automatically processed by the receiving unit, and a Coordinate Accept message transmitted automatically in response. If the flight is within this agreed time or distance prior to the boundary, a Coordinate Negotiate message shall be used.

11.4.2.5.9.3 If a Coordinate Update message is used to propose an amendment to the destination aerodrome, the Coordinate Update message shall contain the original destination in the *Destination aerodrome* data, and the new destination as the amended destination. The operational response to this Coordinate Update message shall also contain the original destination in the *Destination aerodrome* data. Provided that the amendment is accepted, subsequent AIDC messages to the same unit shall only contain the amended destination in the *Destination aerodrome* data.

11.4.2.5.9.4 All Coordinate Update messages shall contain *Boundary estimate data*. When agreed between the two units, a Coordinate update message shall be sent to update other flight plan data such as *CNS equipment* and *Other information*. *Route data*, when included due to a new route needing to be coordinated, shall as a minimum contain information from a point prior to entry into the next unit to the point where the new route rejoins the previously coordinated route.

11.4.2.5.10 *Coordinate Standby messages*

11.4.2.5.10.1 The Coordinate Standby message shall be sent by the unit receiving a Coordinate Initial or Coordinate Negotiate message to indicate to the sending unit that their proposal has been received and will be responded to in due course. It could be used for example, if the coordination message had to be referred for manual processing or if further coordination had to be conducted with another unit.

11.4.2.5.11 *Transfer Initiate messages*

11.4.2.5.11.1 The transfer of control and communication messages that are to be used in a specific ATC environment shall be agreed between the units concerned and should be agreed on a regional basis. The messages used in a high density continental environment will be different from those required in a low density remote airspace environment.

11.4.2.5.11.2 The Transfer Initiate message shall be transmitted automatically by the transferring unit at or prior to an agreed time or distance before the common boundary. This message, initiating the transfer phase, shall only be sent after coordination has been successfully completed with the receiving unit.

11.4.2.5.11.3 The Transfer Initiate message contains all executive data and may optionally include any track data relating to the flight. This information updates the receiving unit with the current control environment of the flight e.g. current cleared flight level and any speed restrictions, rate of climb or descent, heading or direct routing that may have been assigned.

11.4.2.5.11.4 The Transfer Initiate message alleviates the requirement for the controller in the transferring unit to verbally provide this information to the controller in the receiving unit whilst also allowing the automatic update of the flight data held by the receiving unit.

11.4.2.5.11.5 There is no operational response to a Transfer Initiate message.

11.4.2.5.12 *Transfer Conditions Proposal messages*

11.4.2.5.12.1 The Transfer Conditions Proposal message shall be used to manually transfer a flight early, or under conditions that are not in accordance with those specified in the applicable letter of agreement (e.g. assigned speed greater than that agreed to in the letter of agreement, aircraft on heading, etc). If a Transfer Initiate message had not previously been sent, the Transfer Conditions Proposal message initiates the transfer phase, and the transmission of the Transfer Initiate message is not required.

11.4.2.5.12.2 Subsequent amendments to the control environment of the flight are coordinated by the transmission of another Transfer Conditions Proposal message containing new executive data to the receiving unit.

11.4.2.5.12.3 The Transfer Conditions Proposal message proposes the transfer of communication and control of the flight to the controller in the accepting unit, together with updated control environment data. The message should be referred to the controller in the receiving unit for manual processing.

Note.— The terms of the transfer of control contained in the relevant letter of agreement may restrict control of the aircraft until the aircraft has reached the transfer of control point.

11.4.2.5.12.4 The operational response to a Transfer Conditions Proposal is a Transfer Conditions Accept message.

11.4.2.5.13 *Transfer Conditions Accept messages*

11.4.2.5.13.1 The Transfer Conditions Accept message is transmitted by the accepting unit to indicate that the controller has agreed to accept the transfer of communication and control of the flight in accordance with the conditions proposed in the Transfer Conditions Proposal message.

11.4.2.5.13.2 Where required, The Transfer Conditions Accept message shall include the radiotelephony frequency(ies) or channel(s) as appropriate that the flight is to be transferred to.

11.4.2.5.13.3 There is no operational response to a Transfer Conditions Accept message.

11.4.2.5.14 *Transfer Communication Request messages*

11.4.2.5.14.1 The Transfer Communication Request message shall be transmitted by the controller in the accepting unit to request the transfer of communication of a flight. The message shall be used when the controller in the accepting unit requires communication with the flight forthwith and indicates that the controller in the transferring unit should transmit appropriate contact instructions to the relevant aircraft. Where required, The Transfer Communication Request message shall include the radiotelephony frequency(ies) or channel(s) as appropriate that the flight is to be transferred to.

11.4.2.5.14.2 There is no operational response required for the Transfer Communication Request message, but receipt of this message would normally result in a Transfer Communication message being transmitted by the transferring unit when the flight was instructed to contact the receiving unit.

11.4.2.5.15 *Transfer Communication messages*

11.4.2.5.15.1 The Transfer Communication message shall indicate that the controller in the transferring unit has instructed the flight to establish communication with the controller in the accepting unit. On receipt of this message the controller in the receiving unit shall ensure that communication is established shortly thereafter. The Transfer Communication message may optionally include any 'release conditions' for the transfer of control. These release conditions may include climb, descent or turn restrictions, or a combination thereof. If a Transfer Initiate message has not been previously sent, the Transfer Communication message initiates the transfer phase.

11.4.2.5.16 *Transfer Communication Assume messages*

11.4.2.5.16.1 The Transfer Communication Assume message shall be transmitted by the accepting unit to indicate that the flight has established communications with the appropriate controller and completes the transfer.

11.4.2.5.17 *Transfer Control messages*

11.4.2.5.17.1 The Transfer Control message is a proposal for the transfer of control of a flight to the accepting unit. This message shall be transmitted either automatically by the transferring unit at or prior to an agreed time or distance before the common boundary or manually by the controller in the transferring unit. This message, initiating the transfer phase, shall only be transmitted after coordination has been successfully completed with the receiving unit.

11.4.2.5.17.2 The operational response to a Transfer Control message is a Transfer Control Assume message.

11.4.2.5.18 *Transfer Control Assume messages*

11.4.2.5.18.1 The Transfer Control Assume message shall indicate that the controller in the accepting unit has accepted control responsibility for the flight. The receipt of this message completes the transfer of control process.

11.4.2.5.19 *General point messages*

11.4.2.5.19.1 The General Point message shall be transmitted to draw the attention of the controller receiving the message to a flight to support voice coordination. The General Point message shall include details of a flight that may have been previously unknown to the receiving unit, to permit it to be displayed if required. This may include, for example, a flight that had planned to operate in airspace under the control of one ATS unit requesting climb or diversion into airspace controlled by another ATS unit which has no details of the flight.

11.4.2.5.20 *General Executive Data messages*

11.4.2.5.20.1 The General Executive Data message shall be sent after the transition to the transfer state has commenced, and prior to the Transfer Control Assume or Transfer Communication Assume messages, either by the transferring unit to the receiving unit or from the receiving unit to the transferring unit to inform the unit receiving the message of any modification to data relating to the control environment of a flight. If the General Executive Data message is sent by the transferring unit, it may include information such as the current cleared (intermediate) flight level and, if applicable, speed restrictions, climb/descent restrictions and the heading (or direct routing) assigned to the flight. If the General Executive Data message is sent by the receiving unit it includes the radiotelephony frequency or channel as appropriate to which the flight is to be transferred.

11.4.2.5.20.2 There is no operational response required for the General Executive Data message.

11.4.2.5.21 *Free Text General messages*

Note.— Ref 11.4.1.4 for details on Free Text Emergency messages.

11.4.2.5.21.1 The Free Text General message shall only be used to transmit operational information for which any other message type is not appropriate, and for plain language statements. Normally free text information would be presented directly to the controller responsible – or expecting to be responsible – for the flight. When the message does not refer to a specific flight, a facility designation shall be used to allow for the information to be presented to the appropriate ATS position.

11.4.2.5.22 *Application Accept messages*

11.4.2.5.22.1 Except for another Application management message, or a message within which an error has been detected, the Application Accept message shall be sent by an ATS unit receiving an AIDC message that has been processed, found free of errors and, is available for presentation to a control position.

11.4.2.5.23 *Application Reject messages*

11.4.2.5.23.1 The Application Reject message shall be sent by an ATS unit receiving an AIDC message within which an error has been detected. The Application Reject message shall include a code that enables identification of the nature of the error. Regional air navigation agreement shall be the basis for specifying the codes that are available to be implemented.

11.4.2.5.23.2 When Application Reject messages are not in use, local procedures shall ensure that the appropriate controller is alerted within a specified time parameter where no Application Accept has been received in response to a transmitted AIDC message.

11.4.2.6 *Control messages*

11.4.2.6.1 Control messages comprise:

- clearance messages
- flow control messages
- position report and air-report messages.

11.4.2.6.2 *Clearance messages*

11.4.2.6.2.1 Clearances shall contain the following in the order listed:

a) aircraft identification;

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 SSR transponder operation, approach or departure manoeuvres, communications and the time of expiry of the clearance.

Note.— The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not been started.

11.4.2.6.2.2 Instructions included in clearances relating to levels shall consist of:

a) cruising level(s) or, for cruise climb, a range of levels, and, if necessary, the point to which the clearance is valid with regard to the level(s);

b) levels at which specified significant points are to be crossed, when necessary;

c) the place or time for starting climb or descent, when necessary;

d) the rate of climb or descent, when necessary;

e) detailed instructions concerning departure or approach levels, when necessary.

11.4.2.6.2.3 It is the responsibility of the aeronautical station or aircraft operator who has received the clearance to transmit it to the aircraft at the specified or expected delivery time, and to notify the air traffic control unit promptly if it is not delivered within a specified period of time.

11.4.2.6.2.4 Personnel receiving clearances for transmission to aircraft shall transmit such clearances in the exact phraseology in which they are received. In those cases where the personnel transmitting the clearances to the aircraft do not form part of the air traffic services, it is essential that appropriate arrangements be made to meet this requirement.

11.4.2.6.2.5 Level restrictions issued by ATC in air-ground communications shall be repeated in conjunction with subsequent level clearance in order to remain in effect,

11.4.2.6.3 *Flow Control messages*

Note: Format and data conventions for automated interchange of flow control messages have not yet been developed

11.4.2.6.4 *Position report and air-report messages*

11.4.2.6.4.1 The format and data conventions to be used in position report and air-report messages are those specified on the model AIREP/AIREP SPECIAL form at Appendix-1 of PANS-ATM DOC 44444, using:

- for position-report messages: Section 1;
- for air-report messages: Section 1 followed by Sections 2 and/or 3 as relevant.

11.4.3 Flight information messages

11.4.3.1 *Messages containing traffic information*

11.4.3.1.1 *Messages containing traffic information to aircraft operating outside controlled airspace*

11.4.3.1.1.1 Due to the factors influencing the nature of the flight information services, and particularly the question of provision of information on possible collision hazards to aircraft operating outside controlled airspace, it is not possible to specify standard texts for these messages.

11.4.3.1.1.2 Where such messages are transmitted they shall, however, contain sufficient data on the direction of flight and the estimated time, level and point at which the aircraft involved in the possible collision hazard will pass, overtake or approach each other. This information shall be given in such a way that the pilot of each aircraft concerned is able to appreciate clearly the nature of the hazard.

11.4.3.1.2 *Messages containing essential traffic information to IFR flights within controlled airspace*

Whenever such messages are transmitted they shall contain the following text:

a) identification of the aircraft to which the information is transmitted;

b) the words TRAFFIC IS or ADDITIONAL TRAFFIC IS;

c) direction of flight of aircraft concerned;

d) type of aircraft concerned;

e) cruising level of aircraft concerned and ETA for the significant point nearest to where the aircraft will cross levels.

11.4.3.1.3 *Messages containing essential local traffic information*

Whenever such messages are transmitted they shall contain the following text:

a) identification of the aircraft to which the information is transmitted;

b) the words TRAFFIC IS or ADDITIONAL TRAFFIC IS, if necessary;

c) description of the essential local traffic in terms that will facilitate recognition of it by the pilot, e.g. type, speed category and/or colour of aircraft, type of vehicle, number of persons, etc.;

d) position of the essential local traffic relative to the aircraft concerned, and direction of movement.

11.4.3.2 *Messages containing meteorological information*

11.4.3.2.1 Information to a pilot changing from IFR flight to VFR flight where it is likely that flight in VMC cannot be maintained shall be given in the following manner:

" INSTRUMENT METEOROLOGICAL CONDITIONS REPORTED (or forecast) IN THE VICINITY OF (location)".

11.4.3.2.2 Meteorological information concerning the meteorological conditions at aerodromes, to be transmitted to aircraft by the ATS unit concerned, shall be extracted by the ATS unit concerned from the following meteorological messages, provided by the appropriate meteorological office, supplemented for arriving and departing aircraft, as appropriate, by information from displays relating to meteorological sensors (in particular, those related to the surface wind and runway visual range) located in the ATS units:

a) local meteorological routine and special reports;

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

11.4.3.2.3 The meteorological information referred to in 11.4.3.2.2 shall be extracted, as appropriate, from meteorological reports providing information on the following elements.

a) *Mean surface wind direction and speed and s*ignificant variations there from;

Note: - Information on surface wind direction provided in ATS units by the associated meteorological office is referenced to degrees true North. Information on surface wind direction obtained from the ATS surface wind indicator and passed to pilots by ATS units is given in degrees magnetic.

b) visibility, including significant directional variations;

c) runway visual range (RVR);

d) present weather;

e) amount and height of base of low cloud;

f) air temperature and dew-point temperature;

g) altimeter setting(s); and

h) supplementary information.

Note:- Provisions relating to meteorological information to be provided in accordance with 11.4.3.2.3 are contained in ICAO Annex 3 Chapter 4 and Appendix 3 of PANS ATM DOC4444

11.4.3.3 *Messages concerning the operation of aeronautical facilities*

Messages concerning the operation of aeronautical facilities shall be transmitted to aircraft from whose flight plan it is apparent that the operation of the flight may be affected by the operating status of the operating facility concerned. They shall contain appropriate data on the service status of the facility in question, and, if the facility is out of operation, an indication when the normal operating status will be restored.

11.4.3.4 *Messages containing information on aerodrome conditions*

11.4.3.4.1 Whenever information is provided on aerodrome conditions, this shall be done in a clear and concise manner so as to facilitate appreciation by the pilot of the situation described. It shall be issued whenever deemed necessary by the controller on duty in the interest of safety, or when requested by an aircraft. If the information is provided on the initiative of the controller, it shall be transmitted to each aircraft concerned in sufficient time to enable the pilot to make proper use of the information.

11.4.3.4.2 Information that water is present on a runway shall be transmitted to each aircraft concerned, on the initiative of the controller, using the following terms:

DAMP	The surface shows a change of colour due to moisture.
WET	The surface is soaked but there is no standing water.
STANDING WATER	For aeroplane performance purposes, a runway where more than 25 percent of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by water more than 3 mm deep.

Table 11-2: Terms used to transmit the information of water present on the Runway

11.4.3.5 *Messages concerning air traffic incident reports*

11.4.3.5.1 When an aircraft involved in an incident has a destination outside the area of responsibility of the ATS unit where the incident occurred, the ATS unit at the destination aerodrome should be notified and requested to obtain the pilot's report. The following information should be included in the message:

a) type of incident (AIRPROX, procedure or facility);
b) identification of the aircraft concerned;
c) time and position at time of incident;
d) brief details of incident.

CHAPTER 12
PHRASEOLOGIES

12.1 INTRODUCTION

12.1.1 Radiotelephony {RTF} provides the means by which pilots and ground personnel communicate with each other. Used properly the information and instructions transmitted are of vital importance in assisting in the safe and expeditious operation of aircraft. On the other hand, the use of non-standard procedures and phraseology can cause misunderstanding. Incidents and accidents have occurred in which a contributing factor has been the misunderstanding caused by the use of incorrect phraseology. The importance of using correct and precise standard phraseology can not, therefore, be over-emphasized.

12.1.2 Air Traffic Services personnel should adhere to standard phraseologies appropriate to the type of service in conformity with those laid down in this document/ relevant documents of ICAO as amended from time to time. Slang expressions and expressions in regional languages should not be used under any circumstances as these can lead to dangerous situations due to misunderstanding.

12.2 TRANSMITTING TECHNIQUE

12.2.1 The following transmitting techniques will assist in ensuring that transmitted speech is clearly and satisfactorily received:

a) Transmission on RTF should be clear, natural, short and concise as far as practicable.

b) Before transmitting, listen out on the frequency to be used to ensure that there will be no interference with a transmission from another station.

c) Be familiar with good microphone operating techniques. Position of the mouth in relation to microphone should not be changed and correct distance maintained all the time. The change of position of mouth can result in over modulation and can cause distortion if it is brought too close to the mouth.

d) Use a normal conversational tone, speak clearly and distinctly.

e) Maintain an even rate of speech not exceeding 100 words per minute. When it is known that elements of the message will be written down by the recipient, speak at a slightly slower rate.

f) Maintain the speaking volume at a constant level. To make the transmission lively and emphatic, pitch can be varied wherever necessary. Early dropping of voice at the end of the word/sentence should be avoided.

g) A slight pause before and after numbers will assist in making them easier to understand.

h) Enunciation should be clear, crisp and intelligible. Words and sentences should be appropriately timed and placed. Avoid using hesitation sounds such as "er" and "um".

i) Pronunciation should be correct and clear. In case of words likely to be misunderstood, they should be spelt in phonetics.

j) Depress the transmit switch fully before speaking and do not release it until the message is completed. This will ensure that the entire message is transmitted.

12.2.2 Be aware that the mother tongue of the person receiving the message may not be English. Therefore, speak clearly and use standard RTF words and phrases wherever possible.

12.2.3 One of the most irritating and potentially dangerous situations in radiotelephony is a "stuck" microphone button. Operators should always ensure that the button is released after a transmission and the microphone placed in an appropriate place that will ensure that it will not inadvertently be switched on.

12.3 FAMILIARITY WITH RADIO TELEPHONY PROCEDURES

12.3.1 The communication procedures shall be in accordance with Volume II of Annex 10, and pilots, ATS personnel and other ground personnel shall be thoroughly familiar with the radiotelephony procedures.

12.4 ICAO PHONETICS

12.4.1 Pronunciation of numbers

Numeral or numeral element	Pronunciation
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
Decimal	DAY-SEE-MAL
Hundred	HUN-dred
Thousand	TOU-SAND

Table: 12-1: Pronunciation of numbers

12.4.2 Pronunciation of Spelling Alphabets

Letter	Word	Pronunciation
A	Alfa	AL FAH
B	Bravo	BRAH VOH
C	Charlie	CHAR LEE or SHAR LEE
D	Delta	DELL TAH
E	Echo	ECK OH
F	Foxtrot	FOKS TROT
G	Golf	GOLF
H	Hotel	HO TELL
I	India	IN DEE AH
J	Juliett	JEW LEE ETT
K	Kilo	KEY LOH
L	Lima	LEE MAH
M	Maik	MIKE
N	November	NO VEM BER
O	Oscar	OSS CAH
P	Papa	PAH PAH
Q	Quebec	KEH BECK
R	Romeo	ROW ME OH
S	Sierra	SEE AIR RAH
T	Tango	TANG GO
U	Uniform	YOU NEE FORM or OO NEE FORM
V	Victor	VIK TAH
W	Whiskey	WISS KEY
X	X-ray	ECKS RAY
Y	Yankee	YANG KEY
Z	Zulu	ZOO LOO

Table: 12-2: Pronunciation of spelling alphabets

12.5 TRANSMISSIONS OF NUMBERS IN RADIOTELEPHONY:

12.5.1 All numbers except as prescribed in 12.5.2, shall be transmitted by pronouncing each digit separately. The following examples illustrate the application of the procedure:

aircraft call signs	**Transmitted as**
CCA 238	Air China **two three eight**
OAL 242	Olympic **two four two**
flight levels	**transmitted as**
FL 180	flight level **one eight zero**
FL 200	flight level **two hundred**
headings	**transmitted as**
100 degrees	heading **one zero zero**
080 degrees	heading **zero eight zero**
wind direction and speed	**transmitted as**
200 degrees 70 knots	wind **two zero zero** degrees **seven zero** knots
160 degrees 18 knots gusting 30 knots	wind **one six zero** degrees **one eight** knots gusting **three zero** knots
transponder codes	**transmitted as**
2400	squawk **two four zero zero**
1000	squawk **one thousand**
2000	squawk **two thousand**
altimeter setting	**transmitted as**
1009	QNH **one zero zero nine**
1000	QNH **one thousand**
993	QNH **nine nine three**

Table 12-3: Transmissions of numbers in radiotelephony

12.5.2.1 All numbers used in the transmissions of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate. Combinations of thousands and whole hundreds shall be transmitted by pronouncing each digit in the number of thousands followed by the word THOUSAND followed by the number of hundreds followed by the word HUNDRED. The following examples illustrate the application of the procedure:

altitude	**transmitted as**
800	**eight hundred**

3400 12,000	**three thousand four hundred** **one two thousand**
cloud height 2200 4300	**transmitted as** **two thousand two hundred** **four thousand three hundred**
visibility 1000 700	**transmitted as** visibility **one thousand** visibility **seven hundred**
runway visual range 600 1700	**transmitted as** RVR **six hundred** RVR **one thousand seven hundred**

Table 12-4: Transmissions of numbers in altitude, cloud height, visibility and runway visual range (RVR) information.

12.5.2.2 When providing information regarding relative bearing to an object or to conflicting traffic in terms of 12- hour clock, the information shall be given pronouncing the double digits as TEN, ELEVEN, or TWELVE [O' CLOCK].

12.6 STANDARD WORDS AND PHRASES

12.6.1 The following words and phrases shall be used in radiotelephony communications as appropriate and shall have the meaning given below:

WORD/ PHRASE	MEANING
ACKNOWLEDGE	Let me know that you have received and understood this message
AFFIRM	Yes.
APPROVED	Permission for proposed action granted.
BREAK	I hereby indicate the separation between portions of the message. *{TO be used where there is no clear distinction between the text and other portion of the message.}*
BREAK BREAK	I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment.
CANCEL	Annul the previously transmitted clearance.
CHECK	Examine a system or procedure. {No answer is normally expected.}
CLEARED	Authorized to proceed under the conditions specified.
CONFIRM	I request verification of (*clearance, instruction, action, information*)
CONTACT	Establish communication with ….

CORRECT	True or Accurate
CORRECTION	An error has been made in the transmission (or message indicated). The correct version is…
DISREGARD	Ignore
I SAY AGAIN	I repeat for clarity or emphasis.
HOW DO YOU READ	What is the readability of my transmission?
MAINTAIN	Continue in accordance with the condition(s) specified or in its literal sense, e.g. MAINTAIN VFR
MONITOR	Listen out on (frequency)
NEGATIVE	"NO" or "Permission not granted" or "That is not correct" or "Not capable"
OVER	"My transmission is ended and I expect a response from you" Note: **Not normally used in VHF communication**
OUT	"This exchange of transmission is ended and no response is expected" Note: **Not normally used in VHF communication**
READ BACK	"Repeat all, or the specified part, of this message back to me exactly as received"
RECLEARED	"A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof"
REPORT	"Pass me following information"
REQUEST	"I should like to know…" or "I wish to obtain…." Note: Under no circumstances to be used in reply to a question requiring "READ BACK" or a direct answer in the affirmative (AFFIRM) or negative (NEGATIVE)
ROGER	"I have received all of your last transmission." *Note: Under no circumstances to be used in reply to a question requiring "READBACK" or a direct answer in the affirmative (AFFIRM) or negative (NEGATIVE).*
SAY AGAIN	"Repeat all, or the following part, of your last transmission"
SPEAK SLOWER	"Reduce your rate of speech"
STANDBY	"Wait and I will call you" Note: The caller would normally re-establish contact if delay is lengthy. STANDBY is not an approval or denial.
UNABLE	"I can not comply with your request, instruction, or clearance" Note: UNABLE is normally followed by a reason

WILCO	(Abbreviation for "will comply") "I understand your message and will comply with it."
WORDS TWICE	a) As a request: "Communication is difficult. Please send every word, or group of words twice." b) As information: "Since communication is difficult, every word, or group of words, in this message will be sent twice."

Table 12-5: Standard words and phrases used in radiotelephony communications

Note.– *The phrase "GO AHEAD" has been deleted, in its place the use of the calling aeronautical station's call sign followed by the answering aeronautical station's call sign shall be considered the invitation to proceed with transmission by the station calling.*

12.7 CALL SIGNS

12.7.1 Call signs for aeronautical stations

12.7.1.1 Aeronautical stations are identified by the name of the location followed by a suffix. The suffix indicates the type of unit or service provided.

Unit or service	Call sign suffix
Area control center	**CONTROL**
Radar [in general]	**RADAR**
Approach Control	**APPROACH**
Approach control radar	**APPROACH RADAR**
Area Control Radar	**CONTROL RADAR**
Aerodrome control	**TOWER**
Surface movement control	**GROUND**
Flight information service	**INFORMATION**
Apron control / management service	**APRON**
Clearance Delivery	**DELIVERY**
Company dispatch	**DISPATCH**
Aeronautical Station	**RADIO**

Table 12-6: Call signs for the type of units or service

12.7.1.2 When satisfactory communication has been established, and provided that it will not be confusing, the name of the location or the call sign suffix may be omitted.

12.7.2 Aircraft call signs

12.7.2.1 An aircraft radiotelephony call sign shall be one of the following types:

Type	Example
a) Character corresponding to the registration marking of the aircraft	**VTEJP** or **CESSNA VTEJP**
b) The telephony designator of the aircraft operating agency, followed by the last four characters of the registration marking of the aircraft	**INDAIR TEPJ**

c) The telephony designator of the aircraft operating agency, followed by the flight identification	**INDAIR 809**

Table 12-7: Aircraft radiotelephony call sign types

12.7.2.2 After satisfactory communication has been established, and provided that no confusion is likely to occur, aircraft call signs may be abbreviated as follows:

Type	Example
a) The first character of the registration and at least the last two characters of the call sign	**VJP** or **CESSNA VJP**
b) The telephony designator of the aircraft operating agency, followed by at least the last two characters of the call sign	**INDAIR PJ**
c) The telephony designator of the aircraft operating agency, followed by the flight identification	No abbreviated form

Table 12-8: Aircraft radiotelephony abbreviated call sign types

12.8 ESTABLISHMENT AND CONDITION OF COMMUNICATIONS:

12.8.1 When establishing communications, an aircraft should use the full call sign of both the aircraft and the ground station.

12.8.2 When a ground station wishes to broadcast information to all aircraft likely to receive it, the message should be prefaced by the call "**All Stations**".

12.8.3 No reply is expected to such general calls unless individual stations are subsequently called upon to acknowledge receipt.

12.8.4 If there is doubt that a message has been correctly received, a repetition of the message shall be requested either in full or in part.

12.8.5 If there is doubt that a message has been correctly received, a repetition of the message shall be requested either in full or in part as given in table 12-9.

PHRASE	MEANING
Say again	Repeat entire message
Say again … [item]	Repeat specific item
Say again all before …. (the first word satisfactorily received)	Repeat part of message
Say again all after …. (the last word satisfactorily received)	Repeat part of message
Say again all between …. And ….	Repeat part of message

Table 12-9: Phrases to request a repetition of the in full or in part.

12.8.6 When a station is called but is uncertain of the identification of the calling station, the calling station should be requested to repeat its call sign until identification is established.

12.8.7 When an error is made in a transmission, the word "**CORRECTION**" shall be spoken, the last correct group or phase repeated and then the correct version transmitted.

12.8.8 If a correction can best be made by repeating the entire message, the operator shall use the phrase "**CORRECTION I SAY AGAIN**" before transmitting the message a second time.

12.8.9 When it is considered that reception is likely to be difficult, important elements of the message should be spoken twice.

12.9 ISSUE OF CLEARANCE AND READ-BACK REQUIREMENTS:

12.9.1 Controller should pass a clearance slowly and clearly since the pilot needs to write it down and wasteful repetition will thus be avoided. Whenever possible a route clearance should be passed to an aircraft before start up. In any case controllers should avoid passing clearance to a pilot engaged in complicated manoeuvres and on no occasion should a clearance be passed when pilot is engaged in line up or take-off manoeuvres.

12.9.2 An ATC route clearance is not an instruction to takeoff or enter an active runway. The words "**TAKE OFF**" are used only when an aircraft is cleared for takeoff, or when canceling a take-off clearance. At times the word "**DEPARTURE**" or "**AIRBORNE**" is used.

12.9.3 Read back requirements have been introduced in the interests of flight safety. The stringency of the read back requirement is directly related to the possible seriousness of a misunderstanding in the transmission and receipt of ATC clearances and instructions. Strict adherence to read back procedures ensures not only that the clearance has been received correctly but also that the clearance was transmitted as intended. It also serves as a check that the right aircraft, and only that aircraft, will take action on the clearance.

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

a) ATC route clearance;

b) Clearances and instructions to enter, land on, take off on, hold short of, cross taxi and back track 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 e.g.

Air Traffic services: (aircraft call sign) "**SQUAWK THREE FOUR TWO FIVE**".

Aircraft reply: "**SQUAWK THREE FOUR TWO FIVE**, (aircraft call sign)".

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

12.10 TAKE-OFF PROCEDURES

12.10.1 At busy aerodromes with separate GROUND & TOWER functions aircraft are usually transferred to TOWER at or approaching the holding position. Since misunderstandings in the granting and acknowledgement of take-off clearances can result in serious consequences, meticulous care should be taken to ensure that the phraseology employed during the taxi maneuvers can not be interpreted as a take-off clearance.

12.10.2 To reduce the potential for misunderstanding, the take-off clearance shall include the designator of the departure runway when more than one runway is in use.

12.10.3 Except for reasons of safety no transmission shall be directed during take-off.

12.10.4 For traffic reasons it may be necessary for the aircraft to take-off immediately after lining up.

12.10.5 In poor visibility, the controller may request the pilot to report when airborne.

12.10.6 When a pilot abandons the take-off manoeuvre, he should as soon as practicable, inform the control tower that he is doing so and assistance or taxi instructions should be requested, as required.

12.11 FINAL APPROACH AND LANDING

12.11.1 Except for reasons of safety no transmission shall be directed during the last part of the final approach or during the landing roll.

12.11.2 If and when turn on to final is made at a greater distance, “LONG FINAL” report is made. If the aircraft is making a straight-in-approach, a “LONG FINAL” report is made at about 8 NM from touch down. If no landing clearance is received at that time, a “FINAL” report is made at 4NM from touchdown.

12.11.3 “FINAL” report is made when an aircraft turns onto final within 4NM from touchdown.

12.11.4 A pilot may request to fly past the control tower or other observation point for the purpose of visual inspection from the ground.

12.12 AFTER LANDING

12.12.1 Unless absolutely necessary, controllers should not direct taxi instructions to pilots until the landing roll is completed. Unless otherwise advised pilots should remain on tower frequency until the runway is vacated.

12.13 GENERAL

12.13.1 Most phraseologies contained in this chapter show the text of a complete message without call signs. They are intended to be exhaustive, and when circumstances differ, pilots, ATS personnel and other ground personnel will be expected to use appropriate subsidiary phraseologies which should be as clear and concise as possible and designed to avoid possible confusion by those persons using a language other than one of their national languages.

12.13.2 Proper use of channel:

12.13.2.1 An Aeromobile frequency is allotted to Air Traffic Services Unit for the purpose of discharging specific responsibility assigned to that unit. It should be used for that purpose only except in case of temporary unserviceability or in emergency. This would avoid unnecessary loading of channel.

12.13.2.2 There is no place for casualness in Air Traffic Control work. Strict RTF discipline should be maintained and no slackness should be allowed to develop. Shift Supervisory officers, Instructors and Officer-In-Charge of ATS Units during their rounds of ATC Units, should pay particular attention in this regard. To keep a watch on use of correct phraseology, spot checks of tape and transcript should be carried out.

12.13.3 Standard phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology can not serve an intended transmission, plain language shall be used. As it is impossible to issue specific guidelines for all situations, the controller should his/her language skill to transmit in plain language which best describes his/her intentions. For example:

a) **"STANDBY FOR FL360"** is to be avoided and only **"STANDBY"** should be used.

c) **"STANDBY FOR DEPARTURE"** is to be avoided and only **"STANDBY"** or **"HOLD POSITION"** should be used.

d) **"STANDBY TO CROSS RUNWAY"** is to be avoided and only **"STANDBY"** or **"HOLD POSITION"** or **"HOLD AT HOLDING POINT"** should be used

12.14 GROUPING OF PHRASEOLOGIES

12.14.1 The phraseologies are grouped according to types of air traffic service for convenience of reference. However, users shall be familiar with, and use as necessary, phraseologies from groups other than those referring specifically to the type of air traffic service being provided. All phraseologies shall be used in conjunction with call signs (aircraft, ground vehicle, ATC or other) as appropriate. In order that the phraseologies listed should be readily discernible in section 12.15, call signs have been omitted. The phraseologies with * denote pilot transmission.

12.14.2 This chapter includes phrases for use by pilots. ATS personnel and other ground personnel. Phraseologies for the movement of vehicles, other than tow-tractors, on the manoeuvring area are not listed separately as the phraseology associated with the movement of aircraft is applicable, with the exception of taxi instructions, in which case the word "**PROCEED**" shall be substituted for the word "**TAXI**" when communicating with vehicles.

12.14.3 Conditional phrases , such as " behind landing aircraft " or " after departing aircraft" shall not be used for movements affecting the active runway(s), except when aircraft or vehicles concerned are seen by the appropriate controller and pilot. The aircraft or vehicle causing the condition in the clearance issued shall be the first aircraft/ vehicle to pass in front of the other aircraft concerned. In all such cases a conditional clearance shall be given in the following order and consist of:

a) Identification;

b) The condition;

c) The clearance; and

d) Brief reiteration of the condition,

For example:

"REPORT THE B747 ON SHORT FINAL IN SIGHT"

"AIC102 BEHIND B747 ON SHORT FINAL, LINE UP BEHIND"

Note:- This implies the need for the aircraft receiving the conditional clearance to identify the aircraft or vehicle causing the conditional clearance.

12.14.4 If the level of an aircraft is reported in relation to standard pressure 1013.2 hPa, the words" FLIGHT LEVEL" should precede the level figures. If the level of the aircraft is reported in relation to QNH/ QFE, the figure should be followed by the word "FEET" as appropriate.

12.14.5 During operations in or vertical transit through reduced vertical separation minimum (RVSM) airspace with aircraft not approved for RVSM operations, pilots shall report non-approved status in accordance with 12.16.1.11 c) as follows:

a) at initial call on any channel within RVSM airspace;

b) in all request for level changes; and

c) in all read-backs of level clearances

12.14.6 Air traffic controllers shall explicitly acknowledge receipt of messages from aircraft reporting RVSM non- approved status.

Note:- When communications between air traffic control units are conducted, the English language shall be used for such communications.

12.15 Phraseology for Instrument Approaches Procedure originating from Same Radio Nav Aid in case of duplicate procedures for the same runway

12.15.1 In order to distinguish between two or more procedures by using same radio navigation aid for the same runway, a convention of suffixing a single letter is being used. Suffix starts from the letter Z followed by Y and X, where Z is used for the preferred procedure (e.g. ILS Z RWY 28, ILS X RWY 28, VOR Y RWY 10, VOR Y RWY 10 etc.). This helps is avoiding ambiguity between charts, electronic cockpit displays and ATC clearances.

12.15.2 The controller should pronounce the type of approach as mentioned on the published chart.

12.15.3 Phraseologies used for clearances for some of the Instrument Approach Procedures (in Procedural Control environment) are enumerated below:

Example	Phraseology
ILS Z RWY 28	CLEARED ILS ZULU APPROACH RUNWAY 28
VOR X RWY 27	CLEARED VOR X-RAY APPROACH RUNWAY 27
VOR Y RWY 09	CLEARED VOR YANKEE APPROACH RUNWAY 09

Note: *Words in parentheses indicate that specific information, such as a level, a place or a time, etc., must be inserted to complete the phrase, or alternatively that optional phrases may be used. Words in square parentheses indicate optional additional words or information that may be necessary in specific instances.*

12.16 ATC PHRASEOLOGIES (* denotes pilot's transmission)

12.16.1 GENERAL	
Circumstances	Phraseologies
12.16.1.1 Description of levels (subsequently referred to as 'level')	a) **FLIGHT LEVEL** *(number)*; or b) *(number)* **FEET**

12.16.1.2 Level changes, reports and rates …instruction that a climb (or descent) to a level within the vertical range defined is to commence	a) **CLIMB** (or **DESCEND**); followed as necessary by: i) **TO** *(level)* ii) **TO AND MAINTAIN BLOCK** *(level)* **TO** *(level)* iii) **TO REACH** *(level)* **AT** (*or* **BY**) *(time* or *significant point)*; iv) **REPORT LEAVING** (or **REACHING**, or **PASSING**) *(level)* v) **AT** (number) **FEET PER MINUTE [OR GREATER (*or* OR LESS)];**
	b) **MAINTAIN AT LEAST** *(number)* **FEET ABOVE** (or **BELOW**) *(aircraft call sign)*
	c) **REQUEST LEVEL** (or **FLIGHT LEVEL** or **ALTITUDE CHANGE FROM** *(name of unit)* [**AT** *(time or significant point)*].
	d) **STOP CLIMB** (or **DESCENT**) **AT** *(level)*;
	e) **CONTINUE CLIMB** (or **DESCENT**) **TO** *(level)*
	f) **EXPEDITE CLIMB** (or **DESCENT**) **[UNTIL PASSING** *(level)*]
	g) **WHEN READY CLIMB** (or **DESCEND**) **TO** *(level)*
	h) **EXPECT CLIMB** (or **DESCENT**) **AT** (*time* or *Significant point*)
	*i) **REQUEST DESCENT AT** (*time*)
to require action at a specific time or place	j) **IMMEDIATELY;** k) **AFTER PASSING** (*significant point*) l) **AT** (*time or significant point*)
..to require action when convenient	m) **WHEN READY** (*instruction*);
…to require an aircraft to climb or descend maintaining own separation and VMC	n) **MAINTAIN OWN SEPARATION AND VMC [FROM (***level***)] [TO (***level***)]** o) **MAINTAIN OWN SEPARATIN AND VMC ABOVE** (or **BELOW,** or **TO**) (*level*)

…when there is doubt that an aircraft comply with a clearance or instruction	p) **IF UNABLE** (*alternative instructions*) **AND ADVISE**;
…when pilot is unable to comply with a clearance or instruction	*q) **UNABLE;**
…after a flight crew starts to deviate from any ATC clearance or an instruction to comply with an ACAS resolution advisory (RA) (Pilot and controller interchange)	*r) **TCAS RA**; s) **ROGER**
... after the response to an ACAS RA is completed and a return to the ATC clearance or instruction is initiated (Pilot and controller interchange)	*t) **CLEAR OF CONFLICT RETURNING TO** *(assigned clearance)*; u) **ROGER** *(or alternative instructions)*
…after the response to an ACAS RA is completed and the assigned ATC clearance or instruction has been resumed (Pilot and controller interchange)	***v)** **CLEAR OF CONFLICT** *(assigned clearance)* **RESUMED**; **w)** **ROGER** *(or alternative instructions)*;

…after an ATC clearance or instruction contradictory to the ACAS RA is received, the flight crew will follow the RA and inform ATC directly (Pilot and controller interchange)	*x) **UNABLE, TCAS RA;** y) **ROGER**
... clearance to climb on a SID which has published level and/or speed restrictions, where the pilot is to climb to the cleared level and comply with published level restrictions, follow the lateral profile of the SID; and comply with published speed restrictions or ATC issued speed control instructions as applicable.	z) CLIMB VIA SID TO *(level)*
... clearance to cancel level restriction(s) of the vertical profile of a SID during climb	aa) [CLIMB VIA SID TO *(level)*], CANCEL LEVEL RESTRICTION(S)
... clearance to cancel specific level restriction(s) of the vertical profile of a SID during climb	bb) [CLIMB VIA SID TO *(level)*], CANCEL LEVEL RESTRICTION(S) AT *(point(s))*
... clearance to cancel speed restrictions of a SID during climb	cc) [CLIMB VIA SID TO *(level)*], CANCEL SPEED RESTRICTION(S)
... clearance to cancel specific speed restrictions of a SID during climb	dd) [CLIMB VIA SID TO *(level)*], CANCEL SPEED RESTRICTION(S) AT *(point(s))*
…clearance to climb and to cancel speed and level restrictions of a SID	ee) CLIMB UNRESTRICTED TO *(level)* *(or)* CLIMB TO *(level),* CANCEL LEVEL AND SPEED RESTRICTIONS
... clearance to descend on a STAR which has published level and/or speed restrictions, where the pilot is to descend to the cleared level and comply with published level restrictions, follow the lateral profile of the STAR and comply with published speed restrictions or ATC issued speed control instructions.	ff) DESCEND VIA STAR TO *(level)*
... clearance to cancel level restrictions of a STAR during descent	gg) [DESCEND VIA STAR TO *(level)*], CANCEL LEVEL RESTRICTION(S)
... clearance to cancel specific level restrictions of a STAR during descent	hh) [DESCEND VIA STAR TO *(level)*], CANCEL LEVEL RESTRICTION(S) AT *(point(s))*

... clearance to cancel speed restrictions of a STAR during descent ... clearance to cancel specific speed restrictions of a STAR during descent ... clearance to descend and to cancel speed and level restrictions of a STAR	ii) [DESCEND VIA STAR TO *(level)*], CANCEL SPEED RESTRICTION(S) jj) [DESCEND VIA STAR TO *(level)*], CANCEL SPEED RESTRICTION(S) AT (*point(s)*) kk) DESCEND UNRESTRICTED TO *(level) or* DESCEND TO *(level),* CANCEL LEVEL AND SPEED RESTRICTIONS
12.16.1.3 Minimum fuel …indication of minimum fuel	*a) **MINIMUM FUEL;** b) **ROGER [NO DELAY EXPECTED** *or* **EXPECT** *(delay information)***].** *Denotes pilot transmission.
12.16.1.4 Transfer of Control and/or frequency change *Note : - An aircraft may be requested to "**STAND BY**" on a frequency when it is intended that the ATS unit will initiate communications soon and to "**MONITOR**" a frequency when information is being broadcast thereon.*	a) **CONTACT** *(unit call sign) (frequency)* **[NOW**]; b) **AT** (*or* **OVER**) *(time* or *place*) [*or* **WHEN PASSING/LEAVING/REACHING**] *(level)* **CONTACT** *(unit call sign) (frequency);* c) **IF NO CONTACT** *(instructions);* d) **STAND BY FOR** *(unit call sign) (frequency);* *e) **REQUEST CHANGE TO** *(frequency);* f) **FREQUENCY CHANGE APPROVED**; *g)* **MONITOR** *(unit call sign) (frequency);* *h**)** **MONITORING** *(frequency);*

	i) **WHEN READY CONTACT** *(unit call sign) (Frequency);* j) **REMAIN THIS FREQUENCY**
12.16.1.5 8.33 Khz channel spacing *Note.— In this paragraph, the term "point" is used only in the context of naming the 8.33 kHz channel spacing concept and does not constitute any change to existing ICAO provisions or phraseology regarding the use of the term "decimal".*	
... to request confirmation of 8.33 kHz capability	a) **CONFIRM EIGHT POINT THREE THREE;**
... to indicate 8.33 kHz capability	*b) **AFFIRM EIGHT POINT THREE THREE;**
... to indicate lack of 8.33 kHz Capability	*c) **NEGATIVE EIGHT POINT THREE THREE;**
... to request UHF capability	d) **CONFIRM UHF;**
... to indicate UHF capability	*e) **AFFIRM UHF;**
... to indicate lack of UHF capability	*f) **NEGATIVE UHF;**
... to request status in respect of 8.33 kHz exemption	g) **CONFIRM EIGHT POINT THREE THREE EXEMPTED;**
... to indicate 8.33 kHz exempted Status	*h) **AFFIRM EIGHT POINT THREE THREE EXEMPTED;**
... to indicate 8.33 kHz non-exempted status	*i) **NEGATIVE EIGHT POINT THREE THREE EXEMPTED;**
... to indicate that a certain clearance is given because otherwise a non-equipped and/or non-exempted aircraft would enter airspace of mandatory carriage.	j) **DUE EIGHT POINT THREE THREE REQUIREMENT** *Denotes pilot transmission.

12.16.1.6 Change of call sign … to instruct an aircraft to change its type of call sign …to advise an aircraft to revert to the call sign indicated in the flight plan	a) **CHANGE YOUR CALL SIGN TO** *(new call sign)* [**UNTIL FURTHER ADVISED**]; b) **REVERT TO FLIGHT PLAN CALL SIGN** *(call sign)* [**AT** *(significant point)*].
12.16.1.7 Traffic information *… to pass traffic information* *… to acknowledge traffic information*	a) **TRAFFIC** *(information)*; b) **NO REPORTED TRAFFIC;** *c) **LOOKING OUT**; *d) **TRAFFIC IN SIGHT;** ***e) NEGATIVE CONTACT** *[reasons];* f) **[ADDITONAL] TRAFFIC** *(direction)* **BOUND** *(type of aircraft) (level)* **ESTIMATED** *(or* **OVER**) *(significant point)* **AT** *(time)* **g) TRAFFIC IS** *(classification)* **UNMANNED FREE BALLOONS(S) WAS** *[or* **ESTIMATED] OVER** *(place)* **AT** *(time)* **REPORTED** *(level(s))* **[or LEVEL UNKNOWN] MOVING** *(direction) (other pertinent information, if any).*
12.16.1.8 METEOROLOGICAL CONDITIONS	a) [**SURFACE**] **WIND** *(number)* **DEGREES** *(speed) (units)*; b) **WIND AT** *(level) (number)* **DEGREES** *(number)* **KNOTS**; Note :- Wind is always expressed by giving the mean direction and speed and any significant variations thereof. c) **VISIBILITY** *(distance) (units) [direction]*; d) **RUNWAY VISUAL RANGE** (*or* **RVR**) [**RUNWAY** *(number)*] *(distance) (units)*; e) **RUNWAY VISUAL RANGE** (*or* **RVR**) **RUNWAY** *(number)* **NOT AVAILABLE** (*or* **NOT REPORTED**);

… for multiple RVR observations	f) **RUNWAY VISUAL RANGE** (*or* **RVR) [RUNWAY** *(number)] (first position) (distance) (units),(second position) (distance) (units), (third position) (distance) (units);* Note 1 :- Multiple RVR observations are always representative of the touchdown zone, midpoint zone and the roll-out/stop end zone respectively. Note 2 :- Where reports for three locations are given, the indication of these locations may be omitted, provided that the reports are passed in the order of touchdown zone, followed by the mid point zone and ending with the roll-out/stop end zone report
… in the event that RVR information on any one position is not available this information will be included in the appropriate sequence.	g) **RUNWAY VISUAL RANGE** (or **RVR**) [**RUNWAY** *(number)] (first position) (distance) (units),(second position)* **NOT AVAILABLE**, *(third position) (distance) (units)*; h) **PRESENT WEATHER** *(details)*; i) **CLOUD** *(amount,[(type)] and height of base) (unit) (or* **SKY CLEAR***)* j) **CAVOK;** Note :- CAVOK pronounced CAV-O-KAY. k) **TEMPERATURE** [**MINUS**] (*number) (and/or* **DEW-POINT [MINUS*]*** *(number));* l) **QNH** *(number*) [(units)]; m) **QFE** *(number) [(units)];* n) *(aircraft type*) **REPORTED** *(description)* **ICING** *(or* **TURBULENCE***)* [**IN CLOUD**] *(area) (time)* o) **REPORT FLIGHT CONDITIONS.**
12.16.1.9 Position Reporting … to omit position reports until a specific position	a) **NEXT REPORT AT** *(significant point)* b) **OMIT POSITION REPORTS [UNITL** *(specify)*]; c) **RESUME POSITION REPORTING.**

12.16.1.10 Additional Reports	a) **REPORT PASSING** *(significant point)*
… to request a report at a specified place or distance	b) **REPORT** *(distance)* **MILES** (**GNSS** or **DME**) **FROM** *(name of DME station) (or significant point);*
….to report at a specified place or distance	*c) *(distance)* **MILES** (**GNSS** or **DME**) **FROM** *(name of DME station)* (or significant point)
	d) **REPORT PASSING** *(three digits)* **RADIAL** *(name of VOR)* **VOR**;
…to request a report of present position	e) **REPORT** *(GNSS or DME)* **DISTANCE FROM** *(significant point) or (name of DME station);*
… to report present position	* f) *(distance)* **MILES** *(GNSS or DME)* **FROM** *(name of DME station) (or significant point)*
12.16.1.11 Aerodrome Information	a) [*(location)*] **RUNWAY SURFACE CONDITION RUNWAY** *(number) (condition);*
	b) [*(location)*] **RUNWAY SURFACE CONDITION RUNWAY** *(number)* **NOT CURRENT;**
	c) **LANDING SURFACE** *(condition)*;
	d) **CAUTION CONSTRUCTION WORK** *(location);*
	e) **CAUTION** *(specify reasons)* **RIGHT** (or **LEFT**), *(or* **BOTH SIDES) OF RUNWAY** [*number*];
	f) **CAUTION WORK IN PROGRESS** *(or* **OBSTRUCTION**) *(position and any necessary advice);*
	g) **RUNWAY REPORT AT** *(observation time)* **RUNWAY** *(number) (type of precipitant)* **UP TO** *(depth of deposit)* **MILLIMETRES. ESTIMATED SURFACE FRICTION GOOD** *(or* **MEDIUM TO GOOD**, *or* **MEDIUM**, or

	MEDIUM TO POOR, *or* **POOR**; h) **BRAKING ACTION REPORTED BY** *(aircraft type)* **AT** *(time)* **GOOD** (**MEDIUM TO GOOD**, *or* **MEDIUM** or **MEDIUM TO POOR,** *or* **POOR);** i) **RUNWAY** *(or* **TAXIWAY**) *(number)* **WET** [*or* **STANDING WATER**, *or* **SNOW REMOVED** (length and width as applicable), or **TREATED**, *or* **COVERED WITH PATCHES OF DRY SNOW** *(or* **WET SNOW**, *or* **COMPACTED SNOW**, *or* **SLUSH**, *or* **FROZEN SLUSH**, *or* **ICE**, *or* **WET ICE** *or* **ICE UNDERNEATH**, *or* **ICE AND SNOW**, *or* **SNOWDRIFTS**, *or* **FROZEN RUTS AND RIDGES**]; j) **TOWER OBSERVES** *(weather information)*; k) **PILOT REPORTS** *(weather information)*.
12.16.1.12 Operational Status Of Visual And Non-Visual Aids.	a) *(specify visual or non-visual aid)* **RUNWAY** *(number) (description of deficiency);* b) *(type***) LIGHTING** *(unserviceability);* c) **ILS CATEGORY** *(category) (serviceability state*); d) **TAXIWAY LIGHTING** *(description of deficiency);* e) *(type of visual approach slope indicator)* **RUNWAY** *(number) (description of deficiency);*
12.16.1.13 Reduced Vertical Separation Minimum (RVSM) Operations. …. to ascertain RVSM approval status of an aircraft	a) **CONFIRM RVSM APPROVED ;**

……to report RVSM approved status	* b) **AFFIRM RVSM ;**
…….to report RVSM non-approved status followed by supplementary information	*c) **NEGATIVE RVSM** *[(supplementary information, e.g. State Aircraft*)];
Note: See 12.14.5 and 12.14.6 for procedures relating to operations in RVSM airspace by aircraft with non approved status.	
…..to deny ATC clearance in to RVSM airspace	c) **UNABLE ISSUE CLEARANCE INTO RVSM AIRSPACE,MAINTAIN** [*or* **DESCEND TO** , *or* **CLIMB TO**] *(level);*
…..to report when severe turbulence affects the capability of an aircraft to maintain height-keeping requirements for RVSM	*e) **UNABLE RVSM DUE TURBULENCE;**
…..to report that the equipment of an aircraft has degraded below minimum aviation system performance standards	*f) **UNABLE RVSM DUE EQUIPMENT**;
….to request an aircraft to provide information as soon as RVSM-approved status has been regained or the pilot is ready to resume RVSM operations.	g) **REPORT WHEN ABLE TO RESUME RVSM**;
…..to request confirmation that an aircraft has regained RVSM approved status or a pilot is ready to resume RVSM operations.	h) **CONFIRM ABLE TO RESUME RVSM**
…… to report ability to resume RVSM-operations after an equipment or weather related contingency	*i) **READY TO RESUME RVSM**

12.16.1.14 GNSS Service Status	a) **GNSS REPORTED UNRELIABLE** *(or* **GNSS MAY NOT BE AVAILABLE [DUE TO INTERFERENCE]***);* 1) **IN THE VICINITY OF** *(location) (radius)* [**BETWEEN** *(levels)*]; or 2) **IN THE AREA OF** *(description)* (*or* **IN** *(name)* **FIR**) [**BETWEEN** *(levels)*]; b) **BASIC GNSS** (*or* **SBAS**, *or* **GBAS**) **UNAVAILABLE FOR** *(specify operation)* [**FROM** *(time)* **TO** *(time)* (*or* **UNTIL FURTHER NOTICE**)]; *c) **BASIC GNSS UNAVAILABLE [DUE TO (***reason, e.g.* **LOSS OF RAIM** *or* **RAIM ALERT)**]; *d) **GBAS (***or* **SBAS) UNAVAILABLE**. e) **CONFIRM GNSS NAVIGATION**; and * f) **AFFIRM GNSS NAVIGATION** * Denotes pilot transmission.
12.16.1.15 DEGRADATION OF AIRCRAFT NAVIGATION PERFORMANCE	* **UNABLE RNP** *(specify type) (or* **RNAV***)* [**DUE TO** *(reason)*]

12.16.2 AREA CONTROL SERVICES	
Circumstances	Phraseologies
12.16.2.1 Issuance of a Clearance	a) *(name of unit)* **CLEARS** *(aircraft call sign)*; b) *(aircraft call sign)* **CLEARED TO**; c) **RECLEARED** *(amended clearance details)*[**REST OF CLEARANCE UNCHANGED**]; d) **RECLEARED** *(amended route portion)* **TO** *(significant point of original route)* [**REST OF CLEARANCE UNCHANGED**]; e) **ENTER CONTROLLED AIRSPACE** (or **CONTROL ZONE) [VIA** (significant point or route)] **AT** (level) [**AT** (time)]; f) **LEAVE CONTROLLED AIRSPACE** *(or* **CONTROL ZONE)[VIA** *(significant point or route)*] ***AT*** *(level)* *(or* **CLIMBING**, *or* **DESCENDING**); g) **JOIN** *(specify)* **AT** *(significant point)* **AT** *(level)* [**AT** *(time)*].
12.16.2.2 Indication of route and clearance limit	*a)* **FROM** *(location)* **TO** *(location)* b) **TO** *(location)* Followed as necessary by: i) **DIRECT** ii) **VIA** *(route and/or significant points);* iii) **FLIGHT PLANNED ROUTE;** iv) **VIA** *(distance* **DME ARC** *(direction)* **OF** *(name of DME station)* c) *(route)* **NOT AVAILABLE DUE** *(reason)* **ALTERNATIVE(S) IS / ARE** *(route)* **ADVISE.**

12.16.2.3 Maintenance of specified levels	a) **MAINTAIN** *(level)* [**TO** *(significant point)*]; b) **MAINTAIN** *(level)* **UNTIL PASSING** *(significant point)*; c) **MAINTAIN** *(level)* **UNTIL** *(minutes)* **AFTER PASSING** *(significant point)*; *d)* **MAINTAIN** *(level)* **UNTIL** *(time);* e) **MAINTAIN** *(level)* **UNTIL ADVISED BY** *(name of unit);* f) **MAINTAIN** *(level)* **UNTIL FURTHER ADVISED**; g) **MAINTAIN** *(level)* **WHILE IN CONTROLLED AIRSPACE**; h) **MAINTAIN BLOCK** *(level)* **TO** *(level)* Note :- The term "**MAINTAIN**" is not to be used in lieu of "**DESCEND**" or "**CLIMB**" when instructing an aircraft to change level.
12.16.2.4 Specification of cruising levels	a) **CROSS** *(significant point)* **AT** *(or* **ABOVE**, *or* **BELOW**) *(level);* b) **CROSS** *(significant point)* **AT** *(time)* **OR LATER** (or **BEFORE) AT** *(level);* c) **CROSS** *(distance)* **MILES**, *(GNSS or DME) [(direction)*] **OF** *(name of DME station) (or distance) [(direction)] OF (significant point)* **AT** *(or* **ABOVE**, *or* **BELOW**) *(level).*

12.16.2.5 Emergency descent	*a) **EMERGENCY DESCENT** *(intentions);* b) **ATTENTION ALL AIRCRAFT IN THE VICINITY *OF*** *(or* **AT**) *(significant point or location)* **EMERGENCY DESCENT IN PROGRESS FROM** *(level) (followed as necessary by specific instructions, clearance, traffic information etc.*
12.16.2.6 If clearance cannot be issued immediately upon request	**EXPECT CLEARANCE** *(or type of clearance)* **AT** *(time).*
12.16.2.7 When clearance for deviation cannot be issued.	**UNABLE, TRAFFIC** *(direction)* **BOUND** *(type of aircraft) (level)* **ESTIMATED** *(or* **OVER**) *(significant point)* **AT** *(time)* **CALL SIGN** *(call sign)* **ADVISE INTENTIONS**

12.16.2.8 Separation instructions	a) **CROSS** *(significant point)* **AT** *(time)*[**OR LATER** (or **OR BEFORE**)] b) **ADVISE IF ABLE TO CROSS** *(significant point)* **AT** *(time or level)*; c) **MAINTAIN MACH** *(number)* [**OR GREATER** (or **OR LESS**)] [**UNTIL** *(significant point)*] d) **DO NOT EXCEED MACH** *(number)* e) **CONFIRM ESTABLISHED ON THE TRACK BETWEEN** *(significant point)* **AND** *(significant point)* **[WITH ZERO OFFSET];** *f) **ESTABLISHED ON THE TRACK BETWEEN** *(significant point)* **AND** *(significant point)* **[WITH ZERO OFFSET];** g) **MAINTAIN TRACK BETWEEN** *(significant point)* **AND** *(significant point).* **REPORT ESTABLISHED ON THE TRACK;** *h) **ESTABLISHED ON THE TRACK**; i) **CONFIRM ZERO OFFSET;** *j) **AFFIRM ZERO OFFSET**
12.16.2.9 Instructions associated with flying a track (off set), parallel to the cleared route.	a) **ADVISE IF ABLE TO PROCEED PARALLEL OFFSET** b) **PROCEED OFFSET** *(distance)* **RIGHT/LEFT OF** *(route) (track)* [**CENTRAL LINE**] [**AT** *(significant point or time)*][**UNTIL** *(significant point of time)*] [**UNTIL** *(significant point or time)*] c) **CANCEL OFFSET** *(instruction to rejoin cleared flight route or other information)*

12.16.3 APPROACH CONTROL SERVICES	
Circumstances	Phraseologies
12.16.3.1 Departure instructions	*a)* [**AFTER DEPARUTE] TURN RIGHT** (or **LEFT**) **HEADING** *(three digits) (or* **CONTINUE RUNWAY HEADING***) (or* **TRACK EXTENDED CENTRE LINE**) **TO** *(level or signification point)(other instructions as required)* *b)* **AFTER REACHING** *(or* **PASSING***) (level or significant point) (instruction)* c) **TURN RIGHT** *(or* **LEFT***)* **HEADING** *(three digits)* **TO** *(level)* [**TO INTERCEPT** *(track, route, airway etc*)] d) *(standard departure name and number)* **DEPARTURE** e) **TRACK** *(three digits)* **DEGREES** [**MAGNETIC** *(or* **TRUE***)*] *TO* (or **FROM***) (significant point)* **UNTIL** *(time, or* **REACHING** *(fix or significant point or level))* [**BEFORE PROCEEDING ON COURSE**]; f) **CLEARED ~~VIA~~** *(designation)* **DEPARTURE**.
…clearance to proceed direct with advance notice of a future instruction to rejoin the SID	g) CLEARED DIRECT *(waypoint)*, CLIMB TO *(level)*, EXPECT TO REJOIN SID [*(sid designator)*] [AT *(waypoint)*] *then* REJOIN SID [*(sid designator)*] [AT *(waypoint)*] h) CLEARED DIRECT *(waypoint)*,CLIMB TO *(level)* *then* REJOIN SID *(sid designator)* AT *(waypoint)*

12.16.3.2 Approach instructions	a) **CLEARED** *(designation)* **ARRIVAL** b) **CLEARED TO** *(clearance limit) (designation);* *c)* **CLEARED** *(or* **PROCEED***)(details of route to be followed)* *d)* **CLEARED DIRECT** *(waypoint)*, **DESCEND TO** *(level),* **EXPECT TO REJOIN STAR** [*(star designator)*] **AT** *(waypoint)* *then* **REJOIN STAR** [*(star designator)*] [**AT** *(waypoint)*] e) **CLEARED DIRECT** *(waypoint)*, **DESCEND TO** *(level)* *then* **REJOIN STAR** *(star designator)* **AT** *(waypoint)* f) **CLEARED** *(type of approach)* **APPROACH** [**RUNWAY** *(number)*]; g) **CLEARED** *(type of app)* **RUNWAY** *(number)* **FOLLOWED BY CIRCLING TO RUNWAY** *(number);* h) **CLEARED APPROACH RUNWAY** *(number)*; i) **COMMENCE APPROACH AT** *(time)*; h*) **REQUEST STRAIGHT-IN** *((type of approach)* **APPROCH** [**RUNWAY** *(number)*]; i) **CLEARED STRAIGHT-IN** *[(type of approach)*] **APPROCH** [**RUNWAY** *(number)*]; j) **REPORT VISUAL**; k) **REPORT RUNWAY [LIGHTS] IN SIGHT**;
… when a pilot requests a visual approach	l*) **REQUEST VISUAL APPROACH;** m) **CLEARED VISUAL APPROACH RUNWAY** *(number);*
… to request if a pilot is able to accept visual approach	*n)* **ADVISE ABLE TO ACCEPT VISUAL APPROACH RUNWAY** *(number);*

….in case of successive visual approaches when the pilot of a succeeding aircraft has reported having the preceding aircraft in sight	o) **CLEARED VISUAL APPROACH RUNWAY** *(number),* **MAINTAIN OWN SEPARATION FROM PRECEDING** *(aircraft type and wake turbulence category as appropriate)* [**CAUTION WAKE TURBULENCE**]. p) **REPORT** *(significant point)*; **[OUTBOUND**, *or* **INBOUND**]; q) **REPORT COMMENCING PROCEDURE TURN**; *r) **REQUEST VMC DESCENT**; s) **MAINTAIN OWN SEPARATION;** t) **MAINTAIN VMC**; u) **ARE YOU FAMILIAR WITH** *(name)* **APPROACH PROCEDURE;** *v) **REQUEST** *(type of approach)* **APPROACH [RUNWAY** *(number)***];** *w) **REQUEST** (MLS/RNAV plain-language designator); x) **CLEARED** *(MLS/RNAV plain-language designator).* * Denotes pilot transmission.
12.16.3.3 Holding Clearances **…** visual … published holding procedure over a facility or fix … when detailed holding clearance is required	a) **HOLD VISUAL [OVER]** *(position)*, (*or* **BETWEEN** *(two prominent landmarks)*)**;** b) **CLEARED (***or* **PROCEED) TO** *(significant point, name of facility or fix)* **[MAINTAIN (*or* CLIMB *or* DESCEND TO)** *(level)***] HOLD** [*(direction)*] **AS PUBLISHED EXPECT APPROACH CLEARANCE** (*or* **FURTHER CLEARANCE**) **AT** *(time)***;** *c) **REQUEST HOLDING INSTRUCTIONS;** d) **CLEARED** (*or* **PROCEED**) **TO** *(significant point, name of facility or fix)* **[MAINTAIN** (*or* **CLIMB** *or* **DESCEND TO**) *(level)***] HOLD *[(direction)]* [***(specified)* **RADIAL, COURSE, INBOUND TRACK** *(three digits)* **DEGREES] [RIGHT** (*or* **LEFT**)

	HAND PATTERN] [OUTBOUND TIME *(number)* **MINUTES] EXPECT APPROACH CLEARANCE** (*or* **FURTHER CLEARANCE) AT** *(time)* *(additional instructions, if necessary)*; e) **CLEARED TO THE** *(three digits)* **RADIAL OF THE** *(name)* **VOR AT** *(distance)* **DME FIX [MAINTAIN** (*or* **CLIMB** *or* **DESCEND TO**) *(level)*] **HOLD** *[(direction)]* **[RIGHT** (*or* **LEFT**) **HAND PATTERN] [OUTBOUND TIME** *(number)* **MINUTES] EXPECT APPROACH CLEARANCE** (*or* **FURTHER CLEARANCE) AT** *(time)* *(additional instructions, if necessary)*; f) **CLEARED TO THE** *(three digits)* **RADIAL OF THE** *(name)* **VOR AT** *(distance)* **DME FIX [MAINTAIN** (*or* **CLIMB** *or* **DESCEND TO**) *(level)*] **HOLD BETWEEN** *(distance)* **AND** *(distance)* **DME [RIGHT** (*or* **LEFT**) **HAND PATTERN] EXPECT APPROACH CLEARANCE** (*or* **FURTHER CLEARANCE**) **AT** *(time)* *(additional instructions, if necessary).*
12.16.3.4 Expected approach time	a) **NO DELAY EXPECTED;** *b)* **EXPECTED APPROACH TIME** *(time);* *c)* **REVISED EXPECTED APPRAOCH TIME** *(time);* *d)* **DELAY NOT DETERMINED** *(reasons).*

12.16.4 Phraseologies for use on and in the vicinity of the aerodrome

Circumstances	Phraseologies
12.16.4.1 Identification of aircraft	**SHOW LANDING LIGHTS**
12.16.4.2 Acknowledgement by visual means	a) **ACKNOWLEDGE BY MOVING AILERONS (or RUDDER);** b) **ACKNOWLEDGE BY ROCKING WINGS;** c) **ACKNOWLEDGE BY FLASHING LANDING LIGHTS.**

12.16.4.3 Starting procedures … to request permission to start engines … ATC replies	 *a) *[aircraft location]* **REQUEST START UP;** *b) *[aircraft location*] **REQUEST START UP, INFORMATION** *(ATIS identification);* c) **START UP APPROVED;** d) **START UP AT** *(time);* e) **EXPECT START UP AT** *(time)* f) **START UP AT OWN DISCRETION;** g) **EXPECT DEPARTURE** *(time)* **START UP AT OWN DISCRETION.**
12.16.4.4 Push-back procedures Note: - When local procedures so prescribe, authorization for pushback should be obtained from the control tower. … aircraft/ATC	 *a) *[aircraft location]* **REQUEST PUSHBACK**; b) **PUSHBACK APPROVED**; c) **STAND BY;** d) **PUSHBACK AT OWN DISCRETION;** e) **EXPECT** *(number)* **MINUTES DELAY DUE** *(reason);*
12.16.4.5 Towing procedure … ATC response	*a) **REQUEST TOW** *[company name] (aircraft type)* **FROM** *(location)* **TO** *(location);* b) **TOW APPROVED VIA** *(specified routing to be followed);* c) **HOLD POSITION**; d) **STAND BY**

12.16.4.6 To request time check and/or aerodrome data for departure … when no ATIS broadcast is available	*a) **REQUEST TIME CHECK;** b) **TIME** *(time);* ***c)** **REQUEST DEPARTURE INFORMATION**; d) **RUNWAY** *(number),* **WIND** *(direction and speed), (units)* ***QNH*** *(or* **QFE***) (number) [(units)]* **TEMPERATURE [MINUS]** *(number),* [**VISIBILITY** *(distance) (units) (or* **RUNWAY VISUAL RANGE** *(or* **RVR***) distance)(units)]* [**TIME** *(time)*]; Note:- If multiple visibility and RVR observations are available, those that represent the roll out/stop end zone should be used for take-off.

12.16.4.7 Taxi procedures	
… for departure	*a) *[aircraft type][wake turbulence category if "heavy"] [aircraft location]* **REQUEST TAXI** *(intentions];* *b) *[aircraft type][wake turbulence category if "heavy] [aircraft location](flight rules)* **TO** *(aerodrome of destination)* **REQUEST TAXI** *[intentions*]; c) **TAXI TO HOLDING POINT** *[number]* [**RUNWAY** *(number)*] **HOLD SHORT OF RUNWAY***(number)(or* **CROSS RUNWAY** *(number)* [**TIME** *(time)*];
where detailed taxi instructions are required	*d) *(aircraft type][wake turbulence category if "heavy"]* **REQUEST DETAILED TAXI INSTRUCTIONS**; e) **TAXI TO HOLDING POINT** *[number]* [**RUNWAY** *(number)* **VIA** *(specific route to be followed)* **TIME** *(time)]* [**HOLD SHORT OF RUNWAY** *(number) (or* **CROSS RUNWAY** *(number))*];
…where aerodrome information is not available from an alternative source such as ATIS	f) **TAXI TO HOLDING POINT** *[number] (followed by aerodrome information as applicable)* [**TIME** *(time)*]; h) **TAKE** *(or* **TURN***)* **FIRST** *(or* **SECOND***)* **LEFT** *(or* **RIGHT***);* h) **TAXI VIA** *(identification of taxiway);* i) **TAXI VIA RUNWAY** *(number);* j) **TAXI TO TERMINAL** *(or other location, e.g.* **GENERAL AVIATION AREA)** **[STAND** *(number)];*
…for helicopter operations	k*) **REQUEST AIR-TAXIING FROM** *(or* **VIA**) **TO** *(location or routing as appropriate);* l) **AIR-TAXI TO (or VIA)** *(location or routing as appropriate)* ***CAUTION*** *(dust, blowing snow, loose debris, taxiing light aircraft, personnel, etc.)*];

	m) **AIR TAXI *VIA*** *(director, as requested, or specified route)* ***TO*** *(location, heliport, operating or movement area, active or inactive runway).* **AVOID** *(aircraft or vehicles or personnel);*
...after landing	*n) **REQUEST BACKTRACK;**
	o) **BACKTRACK APPROVED;**
	p) **BACKTRACK RUNWAY** *(number);*
… general	*q) *[aircraft location]* **REQUEST TAXI TO** *(destination on aerodrome);*
	r) **TAXI STRAIGHT AHEAD**;
	s) **TAXI WITH CAUTION;**
	t) **GIVE WAY TO** *(description and position of other aircraft);*
	*u) **GIVING WAY TO** *(traffic);*
	*v) **TRAFFIC** *(or type of aircraft)* **IN SIGHT**;
	w) **TAXI INTO HOLDING BAY**;
	x) **FOLLOW** *(description of other aircraft or vehicle);*
	y) **VACATE RUNWAY**
	*z) **RUNWAY VACATED;**
	aa) **EXPEDITE TAXI** (reason);
	*bb) **EXPEDITING**;
	cc) **[CAUTION] TAXI SLOWER** *(reason);*
	*dd) **SLOWING DOWN.**

12.16.4.8 Holding	*a)* **#HOLD** *(direction)* **OF** *(position, runway number, etc.);* b) **#HOLD POSITION**; c) **#HOLD** *(distance)* **FROM** *(position);* d) **#HOLD SHORT OF** *(position);* *e) **HOLDING;** *f) **HOLDING SHORT.** # Require specific acknowledgement from pilot
12.16.4.9 To cross a runway Note:- The pilot will, when requested, report "**RUNWAY VACATED**" when the entire aircraft is beyond the relevant runway-holding position.	*a) **REQUEST CROSS RUNWAY** *(number)* *Note: - If the control tower is unable to see the crossing aircraft (e.g. night, low visibility, etc.), the instruction should always be accompanied by a request to report when the aircraft has vacated and is clear of the runway.* b) **CROSS RUNWAY** *(number)* [**REPORT VACATED];** c) **EXPEDITE CROSSING RUNWAY** *(number)* **TRAFFIC** *(aircraft type)* *(distance)* **MILES FINAL**; d) **TAXI TO HOLDING POINT** *[number]* **RUNWAY** *(number)]* **VIA** *(specific route to be followed),* [**HOLD SHORT OF RUNWAY** *(number)*] or [**CROSS RUNWAY** *(number)*]. *e) **RUNWAY VACATED**
12.16.4.10 Preparation for take off	*a)* **UNABLE TO ISSUE** *(designator)* **DEPARTURE** *(reasons);* b) **REPORT WHEN READY** [**FOR DEPARTURE**]; c) **ARE YOU READY [FOR DEPARTURE]?** d) **ARE YOUR READY FOR IMMEDIATE DEPARTURE?**

	*e) **READY;** f) **LINE UP [AND WAIT];** !g) **LINE UP RUNWAY** *(number);*
…clearance to enter runway and await take- off clearance	*(!- when there is the possibility of confusion during multiple runway operations)* h) **LINE UP. BE READY FOR IMMEDIATE DEPARTURE**;
…conditional clearance	i) *(condition)* **LINE UP** *(brief reiteration);*
…acknowledgement of a conditional clearance	*j) *(condition)* **LINING UP** *(brief reiteration of the condition);*
…confirmation or otherwise of the read-back of conditional clearance	k) **[THAT IS] CORRECT** *(or* **I SAY AGAIN**….. *(as appropriate).*
12.16.4.11 Take-off clearance	a) **RUNWAY** *(number)* **CLEARED FOR TAKE-OFF [REPORT AIRBORNE]**;
….when reduced runway separation is used	b) *(traffic information)* **RUNWAY** *(number)* **CLEARED FOR TAKE-OFF**;
…when take-off clearance has not been complied with	c) **TAKE OFF IMMEDIATELY OR VACATE RUNWAY***[(instructions)];* d) **TAKE OFF IMMEDIATELY OR HOLD SHORT OF RUNWAY**;
…to cancel a take-off clearance	*e)* **HOLD POSITION, CANCEL TAKE-OFF I SAY AGAIN CANCEL TAKE-OFF** *(reasons);* *f) **HOLDING**; {pilot's response to e)}
… to stop a take-off after an aircraft has commenced take-off roll	g) **STOP IMMEDIATELY** [*(repeat aircraft call sign)* **STOP IMMEDIATELY**]; *h) **STOPPING**; {pilot's response to g)}
… for helicopter operations	i) **CLEARED FOR TAKE-OFF [FROM** *(location)***]** *(present position, taxiway, final approach and take-off area, runway and number);* *j) **REQUEST DEPARTURE**

	INSTRUCTIONS; k) **AFTER DEPARTURE TURN RIGHT** *(or* **LEFT** *or* **CLIMB**) *(instructions as appropriate).*
12.16.4.12 Turn or climb instructions after take-off	*a) **REQUEST RIGHT** *(or* **LEFT***)* **TURN;** b) **RIGHT** *(or* **LEFT TURN APPROVED**; c) **WILL ADVISE LATER FOR RIGHT** *(or* **LEFT TURN**;
… to request airborne time	d) **REPORT AIRBORNE**; e) **AIRBORNE** *(time)* f) **AFTER PASSING** *(level) (instructions);*
… heading to be followed	g) **CONTINUE RUNWAY HEADING** *(instructions);*
… when a specific track is to be followed	h) **TRACK EXTENDED CENTRELINE** *(instructions)* i) **CLIMB STRAIGHT AHEAD** *(instructions).*
12.16.4.13 Entering an aerodrome traffic circuit	*a) *[aircraft type](position) (level)* **FOR LANDING**; b) **JOIN** *(direction of circuit) (direction of circuit) (runway number)*[**SURFACE**] ***WIND*** *(direction and speed) (units)* [**TEMPERATURE [MINUS]** *(number)*] **QNH** *(or* **QFE**) *(number) [(units)*] [**TRAFFIC***(detail)*]; c) **MAKE STRAIGHT-IN APPROCH, RUNWAY** *(number)* **[SURFACE] WIND** *(direction and speed) (units)*

… when ATIS information is available	[**TEMPERATURE[MINUS]** *number)* **QNH** *(or* **QFE***)(number) (units)*][**TRAFFIC** *(detail)*]; *d) *(aircraft type), (position) (level)* **INFORMATION** *(ATIS identification)* **FOR LANDING;** e) **JOIN** *(position in circuit)* [**RUNWAY** *(number)*] **QNH** *(or* **QFE***) (number) (units)*] [**TRAFFIC** *(detail)*].
12.16.4.14 In the circuit	*a) *(position in circuit, e.g.* **DOWNWIND** / **FINAL***);* b) **NUMBER … FOLLOW** *(aircraft type and position) [additional instructions if required]*.
12.16.4.15 Approach instructions	a) **MAKE SHORT APPROACH.** b) **MAKE LONG APPROCH** *(or* **EXTEND DOWNWIND***);* c) **REPORT BASE** *(or* **FINAL**, *or* **LONG FINAL***);* d) **CONTINUE APPROCH [PREPARE FOR POSSIBLE GO AROUND].**
12.16.4.16 Landing Clearance ….when reduced runway separation is used … special operations …to make an approach along or parallel to a runway, descending to an agreed minimum level … to fly past the control tower or other observation point for the purpose of visual inspection by persons on the ground. … for helicopter operations	a) ***RUNWAY*** *(number)* **CLEARED TO LAND**; b) *(traffic information)* **RUNWAY** *(number)* **CLEARED TO LAND**; c) **CLEARED TOUCH AND GO**; d) **MAKE FULL STOP**; *e) **REQUEST LOW APPROACH** *(reasons);* f) **CLEARED LOW APPROACH [RUNWAY** *(number)][(altitude restriction if required) (go around instructions)];* *g) **REQUEST LOW PASS** *(reasons);* h) **CLEARED LOW PASS [RUNWAY** *(number)][(altitude restriction if required) (go around instructions)];* i*)**REQUEST STRAIGHT-IN** *(or* **CIRCLING APPROACH, LEFT** *(or* **RIGHT***)* **TURN TO**

	(location)); j) **MAKE STRAIGHT-IN** *(or* **CIRCLING APPROACH**, **LEFT** *(or* **RIGHT***)* **TURN TO** *(location, runway, taxiway, final approach and take-off area)* [**ARRIVAL** *(or* **ARRIVAL ROUTE**) *(number, name, or code)*]. [**HOLD SHORT OF** *(active runway, extended runway centre line, other)*]. [**REMAIN** *(direction or distance)* **FROM** *(runway, runway center line, other helicopter or aircraft)*]. [**CAUTION** *(power lines, unlighted obstructions, wake turbulence, etc.)*]. **CLEARED TO LAND**.
12.16.4.17 Delaying aircraft	a) **CIRCLE THE AERODROME;** b) **ORBIT (RIGHT,** *or* **LEFT)[FROM PRESENT POSITION];** c) **MAKE ANOTHER CIRCUIT.**
12.16.4.18 Missed approach	a) **GO AROUND;** *b) **GOING AROUND**.
12.16.4.19 Information to aircraft ...when pilot requested visual inspection of landing gear … wake turbulence … jet blast on apron or taxiway … propeller-driven aircraft slipstream	a) **LANDING GEAR APPEARS DOWN;** b) **RIGHT** (*or* **LEFT**, *or* **NOSE**) **WHEEL APPEARS UP** (*or* **DOWN**); c) **WHEELS APPEAR UP**; *d)* **RIGHT** *(or* **LEFT**, *or* **NOSE**) **WHEEL DOES NOT APPEAR UP** *(or* **DOWN***);* e) **CAUTION WAKE TURBULENCE [FROM ARRIVING** *(or* **DEPARTING***) (type of aircraft) [additional information as required];* f) **CAUTION JET BLAST;** g) **CAUTION SLIPSTREAM**.
12.16.4.20 Runway vacating and communications after landing	a) **CONTACT GROUND** *(frequency);* b) **WHEN VACATED CONTACT**

	GROUND *(frequency);* c) **EXPEDITE VACATING**; d) **YOUR STAND (***or* **GATE)***(designation);* e) **TAKE** *(or* **TURN***)* **FIRST** *(or* **SECOND**, *or* **CONVENIENT**) **LEFT** *(or* **RIGHT***)* **AND CONTACT GROUND** *(frequency);*
… for helicopter operations	f) **AIR-TAXI TO HELICOPTER STAND** *(or)* **HELICOPTER PARKING POSITION** *(area);* g) **AIR-TAXI TO** *(or* **VIA***) (location or routing as appropriate)* [**CAUTION** *(dust, blowing snow, loose debris, taxiing light aircraft, personnel, etc.)*]; h) **AIR TAXI VIA** *(direct, as requested, or specified route)* **TO** *(location heliport, operating or movement area, active or inactive runway).* **AVOID** *(aircraft or vehicles or personnel).*

12.16.5 CO-ORDINATION BETWEEN ATS UNITS

Circumstances	Phraseologies
12.16.5.1 Estimates and revisions	a) **ESTIMATE** *(direction of flight) (aircraft call sign)* [**SQUAWKING** *(SSR Code)*] *(type)* **ESTIMATED** *(significant point)(time) (level) (or* **DESCENDING FROM** *(level)* **TO** *(level))*[**SPEED** *(filed TAS)*] *(route) [(point of departure)* **TO** *(point of destination)]* [*RVSM status*][**REMARKS**];
… sending unit	b) **ESTIMATE** *(significant point)* **ON** *(aircraft call sign)*
…receiving unit reply (if flight plan details are not available)	c) **NO DETAILS**;
….receiving unit reply (if flight plan details are available)	*(aircraft type) (destination);*

..sending unit reply	[**SQUAWKING** *(SSR Code)* [**ESTIMATED**] *(significant point) (time)* **AT** *(level);* Note :- In the event that flight plan details are not available the receiving station shall reply to b) NO DETAILS and transmitting station shall pass full estimate as in a). d) **ESTIMATE UNMANNED FREE BALLOONS(S)** *(identification and classification)* **ESTIMATED OVER** *(place)* **AT** *(time)* **REPORTED FLIGHT LEVEL(S)** *(figure or figures) [or* **FLIGHT LEVEL UNKNOWN**] **MOVING** *(direction)* **ESTIMATED GROUND SPEED** *(figure) (other pertinent information, if any);* e) **REVISION** *(aircraft call sign) (details as necessary).*
12.16.5.2 Transfer of control	a) **REQUEST RELEASE OF** *(aircraft call sign);* *b) (aircraft call sign)* **RELEASED** [**AT** *(time)*] *[conditions/restrictions];* c) **IS** *(aircraft call sign)* **RELEASED [FOR CLIMB** *(or* **DESCENT**)]?; *d) (aircraft call sign)* **NOT RELEASED [UNTIL** *(time or significant point)];* e) **UNABLE** *(aircraft call sign)* [**TRAFFIC IS** *(details)*].
12.16.5.3 Change of clearance	a) **MAY WE CHANGE CLEARANCE OF** *(aircraft call sign)* **TO** *(details of alteration proposed);* b) **AGREED TO** *(alteration of clearance)OF (aircraft call sign);* c) **UNABLE** *(aircraft call sign);* d) **UNABLE** *(desired route, level, etc.* [**FOR** *(aircraft call sign)*] [**DUE** *(reason)*] *(alternative clearance proposed).*

12.16.5.4 Approval request	a) **APPROVAL REQUEST** *(aircraft call sign)* **ESTIMATED DEPARTURE FROM** *(significant point)* **AT** *(time);* b) *(aircraft call sign)* **REQUEST APPROVED** [*(restriction if any)*]; c) *(aircraft call sign)* **UNABLE** *(alternative instructions*).
12.16.5.5 Inbound release	**INBOUND RELEASE** *(aircraft call sign)* [**SQUAWKING** *(SSR Code)*] *(type)* **FROM** *(departure point)* **RELEASED AT** *(significant point, or time, or level)* **CLEARED TO AND ESTIMATING** *(clearance limit)(time*) **AT** *(level)* [**EXPECTED APPROACH TIME** *or* **NO DELAY EXPECTED**] **CONTACT AT** *(time).*
12.16.5.6 Handover	**HANDOVER** *(aircraft call sign)* [**SQUAWKING** *(SSR Code)*] **POSITION** *(aircraft position (level).*
12.16.5.7 Expedition of clearance	a) **EXPEDITE CLEARANCE** *(aircraft call sign)* **EXPECTED DEPARTURE FROM** *(place)* **AT** *(time);* b) **EXPEDITE CLEARANCE** *(aircraft call sign)* [**ESTIMATED**] **OVER** *(place)* **AT** *(time)* **REQUESTS** *(level or route, etc.).*
12.16.5.8 Reduced vertical separation minimum (RVSM) operations ….. to verbally supplement estimate messages of aircraft non-approved for RVSM or to verbally supplement an automated estimate message exchange that does not automatically transfer information from item 18 of the flight plan followed by supplementary information , as appropriate. ….. to communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe meteorological phenomena or equipment failure, as applicable.	a) **NEGATIVE RVSM** ***[(****supplementary information, e.g. State Aircraft)]* b) **UNABLE RVSM DUE TURBULENCE** *(or* **EQUIPMENT,** *as applicable).*

12.16.6 Phraseologies to be used related to CPDLC	
12.16.6.1 Operational status	
… failure of CPDLC	*a)* **[ALL STATIONS] CPDLC FAILURE** *(instructions)*
… failure of a single CPDLC Message	*b)* **CPDLC MESSAGE FAILURE** *(appropriate clearance, instruction, information or request)*
…to correct CPDLC clearances, instructions, information or Requests	c) **DISREGARDED CPDLC** *(message type)* **MESSAGE, BREAK** *(correct clearance, instruction, information or request)*
…to instruct all stations or a specific flight to avoid sending CPDLC requests for a limited period of time	*d)* **[ALL STATIONS] STOP SENDING CPDLC REQUESTS [UNTIL ADVISED]** *[(reason)]*
…to resume normal use of CPDLC	e) **[ALL STATIONS] RESUME NORMAL CPDLC OPERATIONS.**

12.17 ATS SURVEILLANCE PHRASEOLOGIES

Note: The following comprise phraseologies specifically applicable when ATS surveillance system is used in the provision of air traffic services. The phraseologies detailed in sections above for use in the provision of air traffic services are also applicable, as appropriate, when ATS surveillance system is used.

12.17.1 GENERAL ATS SURVEILLANCE SERVICE PHRASEOLOGIES	
Circumstances	**Phraseologies**
12.17.1.1 Identification of aircraft	a) **REPORT HEADING** [**AND FLIGHT LEVEL** *(or* **ALTITUDE***)*]; b) **FOR IDENTIFICATION TURN LEFT** *(or* **RIGHT***)* **HEADING** *(three digits);* c) **TRANSIMIT FOR IDENTIFICATION AND REPORT HEADING;** d) **RADAR CONTACT** *[position];* e) **IDENTIFIED** *[position];* f) **NOT IDENTIFIED** *[reason],* [**RESUME** *(or* **CONTINUE***)* **OWN NAVIGATION**].
12.17.1.2 Position information	**POSITION** *(distance) (direction)* **OF** *(signification point) (or* **OVER** *or* **ABEAM** *(signification point)).*
12.17.1.3 Vectoring instructions	*a)* **LEAVE** *(signification point)* **HEADING** *(three digits);* b) **CONTINUE HEADING** *(three digits);* c) **CONTINUE PRESENT HEADING;** *d)* **FLY HEADING** *(three digits);* *e)* **TURN LEFT** *(or* **RIGHT***)* **HEADING** *(three digits) [reasons];* *f)* **TURN LEFT** *(or* **RIGHT***) (number of degrees)* **DEGREES** *[reasons];* g) **STOP TURN HEADING** *(three digits);* h) **FLY HEADING** *(three digits),* **WHEN ABLE PROCEED DIRECT** *(name) (signification point);* i) **HEADING IS GOOD.**
12.17.1.4 Termination of radar vectoring	*a)* **RESUME OWN NAVIGATION** *(position of aircraft)(specific instructions);* b) **RESUME OWN NAVIGATION** [**DIRECT**] *(significant point)* [**MAGNETIC** ***TRACK*** *(three digits)* **DISTANCE** *(number)* **MILES**].

12.17.1.5 Manoeuvres … (in case of unreliable directional instruments on board aircraft) Note :- When it is necessary to specify a reason for radar vectoring or for the above manoeuvres, the following phraseologies should be used: *a) DUE TRAFFIC;* *b) FOR SPACING;* *c) FOR DELAY;* *d) FOR DOWNWIND (or BASE, or FINAL).*	*a)* **MAKE A THREE SIXTY TURN LEFT** (or **RIGHT**) *[reason];* b) **ORBIT LEFT** *(or* **RIGHT***) [reasons];* c) **MAKE ALL TURNS RATE ONE** (or **RATE HALF**, *or (number)* **DEGREES PER SECOND) START AND STOP ALL TURNS ON THE COMMAND "NOW";** d) **TURN LEFT** *(or* **RIGHT***)* **NOW**; e) **STOP TURN NOW**.
12.17.1.6 Speed control	a) **REPORT SPEED**; *b) **SPEED** *(number)* **KNOTS**; aa) **REPORT MACH NUMBER** c) **MAINTAIN** *(number)* **KNOTS** [**OR GREATER** *(or* **OR LESS**] [**UNTIL***(significant point)*]; cc) **MAINTAIN MACH** *(number)* d) **DO NOT EXCEED** *(number)* **KNOTS;** e) **MAINTAIN PRESENT SPEED;** f) **INCREASE** *(or* **REDUCE***)* **SPEED TO** *(number)* **KNOTS OR GREATER** *(or* **LESS***)*], **IF UNABLE ADVISE** g) **INCREASE** *(or* **REDUCE***)* **SPEED TO MACH** *(number)* **OR GREATER** *(or* **LESS***)*], **IF UNABLE ADVISE** h) **INCREASE** *(or* **REDUCE***)* **SPEED BY** *(number)* **KNOTS**; i) **RESUME NORMAL SPEED;** j) **REDUCE TO MINIMUM APPROACH SPEED;**

	k) **REDUCE TO MINIMUM CLEAN SPEED;** l) **RESUME PUBLISHED SPEED** m) **NO ATC SPEED RESTRICTION.**
12.17.1.7 Position reporting … to omit position reports	a) **OMIT POSITION REPORTS** [**UNTIL** *(specify)*]; b) **NEXT REPORT AT** *(significant point);* *c)* **REPORTS REQUIRED ONLY AT** *(significant point(s));* d) **RESUME POSITION REPORTING.**
12.17.1.8 Traffic information and avoiding action	a) **TRAFFIC** *(number)* **O'CLOCK** *(distance) (direction of flight)[any other pertinent information];* 1) **UNKNOWN;** 2) **SLOW MOVING;** 3) **FAST MOVING;** 4) **CLOSING;** 5) **OPPOSITE** *(or* **SAME DIRECTION***);* 6) **OVERTAKING;** 7) **CROSSING LEFT TO RIGHT** *(or* **RIGHT TO LEFT**);
… (if known)	*8) (aircraft type)**;*** *9) (level);* 10) **CLIMBING** *(or* **DESCENDING***);*
… to request avoiding action	*b) **REQUEST VECTORS**; c) **DO YOU WANT VECTORS**?
… when passing unknown traffic	*d)* **CLEAR OF TRAFFIC** *[appropriate instructions];*
… for avoiding action	e) **TURN LEFT** *(or* **RIGHT***)* **IMMEDIATELY HEADING** *(three digits)* **TO AVOID** [**UNIDENTIFIED**] **TRAFFIC** *(bearing by clock reference and distance);* *f)* **TURN LEFT** *(or* **RIGHT***) (number of degrees)* **DEGREES IMMEDIATELY TO AVOID** [**UNIDENTIFIED**] **TRAFFIC AT** *(bearing by clock-reference and distance).*

12.17.1.9 Communications and loss of communications … if loss of communications suspected	a) **[IF] RADIO CONTACT LOST** *(instructions);* b) **IF NO TRANSMISSIONS RECEIVED FOR** *(number)* **MINUTES** *(or* **SECONDS***) (instructions);* c) **REPLY NOT RECEIVED** *(instructions);* d) **IF YOU READ** *(manoeuvre instructions or* **SQUAWK** *(code or* **IDENT***)*]; e) *(manoeuvre,* **SQUAWK** or **IDENT**) **OBSERVED. POSITION** *(position of aircraft), [(instructions)]***.**
12.17.1.10 Termination of radar and/or ADS-B service	*a)* **RADAR SERVICE** *(or* **IDENTIFICATION**) **TERMINATED** [**DUE** *(reason)*] *(instructions);* *b)* **WILL SHORTLY LOSE IDENTIFICATION** *(appropriate instructions or information);* c) **IDENTIFICATION LOST** *[reasons] (instructions).*
12.17.1.11 Radar and/or ADS-B equipment degradation	*a)* **SECONDARY RADAR OUT OF SERVICE** *(appropriate information as necessary);* *b)* **PRIMARY RADAR OUT OF SERVICE** *(appropriate information as necessary)* c) **ADS-B OUT OF SERVICE** *(appropriate information as necessary).*
12.17.2 RADAR IN APPROACH CONTROL SERVICE	
12.17.2.1 Vectoring for approach	a) **VECTORING FOR** *(type of pilot-interpreted aid)* **APPROCH RUNWAY** *(number);* b) **VECTORING FOR VISUAL APPROACH RUNWAY** *(number)* **REPORT FIELD** *(or* **RUNWAY**) **IN SIGHT**; *c)* **VECTORING FOR** *(positioning in the circuit);* d) **VECTORING FOR SURVEILLANCE RADAR APPRAOCH RUNWAY** *(number);* e) *(type)* **APPROACH NOT AVAILABLE DUE** *(reason) (alternative instructions).*

12.17.2.2 Vectoring for ILS and other pilot- interpreted aids	a) **POSITION** *(number)* **MILES FROM** *(fix).* **TURN LEFT** *(or* **RIGHT**) **HEADING** *(three digits);* *b)* **YOU WILL *INTERCEPT*** *(radio aid or track) (distance)* **FROM** *(significant point or* **TOUCHDOWN***);*
… when a pilot wishes to be positioned a specific distance from touchdown	*c) **REQUEST** *(distance)* **FINAL**; d) **CLEARED FOR** *(type)* **APPROCH RUNWAY** *(number);*
… instructions and information	e) **REPORT ESTABLISHED** [**ON ILS** *or* **LOCALIZER** *or* **GLIDE PATH**]; f) **CLOSING FROM LEFT** *(or* **RIGHT***)* [**REPORT ESTABLISHED**); g) **TURN LEFT** *(or* **RIGHT***)* **HEADING** *(three digits)* **TO INTERCEPT LOCALIZER** *(or radio aid)* **REPORT ESTABLISHED**; h) **CONTINUE PRESENT HEADING** *(three digits)* **TO INTERCEPT LOCALIZER** *(or radio aid)* **REPORT ESTABLISHED**; i) **EXPECT VECTOR ACROSS** *(localizer course or radio aid) (reasons);* j) **THIS TURN WILL TAKE YOU THROUGH** *(localizer course or radio aid) [reasons];* k) **TAKING YOU *THROUGH*** *(localizer course or radio aid) [reasons];* l) **MAINTAIN** *(altitude)* **UNTIL GLIDE PATH INTERCEPTION;** m) **REPORT ESTABLISHED ON GLIDE PATH**; n**)** **INTERCEPT** *(localizer course or radio aid)* **REPORT ESTABLISHED**
12.17.2.3 Manoeuvre during independent and dependent parallel approaches	a) **CLEARD FOR ILS APPROACH RUNWAY** *(number)* **LEFT** *(or* **RIGHT***);* b) **YOU HAVE CROSSED THE LOCALIZER. TURN LEFT** *(or* **RIGHT***)* **IMMEDIATELY AND RETURN TO THE LOCALIZER** ; c) **ILS RUNWAY** *(number)* **LEFT** *(or* **RIGHT***)*

… for avoidance action when an aircraft is observed penetrating the NTZ	**LOCALIZER REEQUENCY IS** *(frequency);* d) **TURN LEFT** (*or* **RIGHT**) *(number)* **DEGREES** *(or* **HEADING** *(three digits))* **IMMEDIATELY TO AVOID TRAFFIC [DEVIATING FROM ADJACENT APPRAOCH], CLIMB TO** *(altitude).*
…for avoidance action below 400 ft above the runway threshold elevation where parallel approach obstacle surfaces (PAOAS) criteria is being applied	e) **CLIMB TO** *(altitude)* **IMMEDIATELY TO AVOID TRAFFIC [DEVIATING FROM ADJACENT APPROACH]** *(further instructions)*
12.17.2.4 SURVEILLANCE RADAR APPRAOCH	
12.17.2.4.1 Provision of service	a) **THIS WILL BE A SURVEILLANCE RADAR APPRAOCH RUNWAY** *(number)* **TERMIANTING AT** *(distance)* **FROM TOUCHDOWN, OBSTACLE CLEARACNE ALTITUDE** *(number)* **FEET CHECK YOUR MINIMA [IN CASE OF GO AROUND** *(instructions)*]; b) **APPROACH INSTRUCTIONS WILL BE TERMINATED AT** *(distance)* **FROM TOUCHDOWN**.
12.17.2.4.2 Elevation	a) **COMMENCE DESCENT NOW TO MAINTAIN A** *(number)* **DEGREE GLIDE PATH**; b) *(distance)* **FROM TOUCHDOWN ALTITUDE SHOULD BE** *(number and units).*
12.17.2.4.3 Position	*(distance)* **FROM TOUCHDOWN**
12.17.2.4.4 Checks	a) **CHECK GEAR DOWN [AND LOCKED];** b) **OVER THRESHOLD.**
12.17.2.4.5 Completion of approach	a) **REPORT VISUAL;** b) **REPORT RUNWAY [LIGHTS] IN SIGHT;** c) **APPROCH COMPLETED** [**CONTACT** *(unit)*];
12.17.3 Secondary surveillance radar (SSR) and ADS-B Phraseologies	
12.17.3.1 To request the capability of the SSR equipment	a) **ADVISE TRANSPONDER CAPABILITY;** *b) **TRANSPONDER** *(as shown in the flight plan);*

	*c) **NEGATIVE TRANSPONDER.**
12.17.3.2 To request the capability of the ADS-B equipment	a) **ADVISE ADS-B CAPABILITY;** *b) **ADS-B TRANSMITTER** *(data link);* *c) **ADS-B RECEIVER** *(data link);* *d) **NEGATIVE ADS-B**.
12.17.3.3 To instruct setting of transponder	*a)* **FOR DEPARTURE SQUAWK** *(code);* b) **SQUAWK** *(code)*
12.17.3.4 To request the pilot to reselect the assigned mode and code	*a)* **RESET SQUAWK** *[(mode)] (code);* *b) **RESETTING** *(mode) (code).*
12.17.3.5 To request reselection of aircraft identification	**RE-ENTER [ADS-B** or **MODE S] AIRCRAFT IDENTIFICATION**
12.17.3.6 To request the pilot to confirm the Code selected on the aircraft's transponder	a) **CONFIRM SQUAWK** *(code);* *b) **SQUAWKING** *(code).*
12.17.3.7 To request the operation of the IDENT feature	a) **SQUAWK** *[(code)]* [**AND**] **IDENT**; b) **SQUAWK LOW;** c) **SQUAWK NORMAL;** d) **TRANSMIT ADS-B IDENT.**
12.17.3.8 To request temporary suspension of transponder operation	**SQUAWK STANDBY.**
12.17.3.9 To request emergency code	**SQUAWK MAYDAY (CODE SEVEN-SEVEN ZERO-ZERO]**
12.17.3.10 To request termination of transponder and/or ADS-B transmitter operation *Note.-Independent operations of Mode S transponder and ADS-B may not be possible in all aircraft (e.g. where ADS-B is solely provided by 1090 MHz extended squitter emitted from the transponder). In such cases, aircraft may not be able to comply with ATC instructions related to ADS-B operation.*	a) **STOP SQUAWK** [**TRANSMIT ADS-B ONLY**]; b) **STOP ADS-B TRANSMISSION** [**SQUAWK** *(code)* **ONLY**]
12.17.3.11 To request transmission of pressure altitude	a) **SQUAWK CHARLIE**; b) **TRANSMIT ADS-B ALTITUDE.**
12.17.3.12 To request pressure setting check and confirmation of	**CHECK ALTIMETER SETTING AND CONFIRM** *(level).*

level	
12.17.3.13 To request termination of pressure altitude transmission because of faulty operation *Note.- See Note to paragraph 12.17.3.10*	a) **STOP SQUAWK CHARLIE WRONG INDICATION**; b) **STOP ADS-B ALTITUDE TRANSMISSION** [(**WRONG INDICATION**, *reason)*].
12.17.3.14 To request level check	**CONFIRM** *(level).*

12.18 Alerting phraseologies

Circumstances	Phraseologies
12.18.1 Low altitude warning	*(aircraft call sign)* **LOW ALTITUDE WARNING**, **CHECK YOUR ALTITUDE IMMEDIATELY, QNH IS** *(number) [(units)*] [**THE MINIMUM FLIGHT ALTITUDE IS** *(altitude)*].
12.18.2 Terrain Alert	*(aircraft call sign)* **TERRAIN ALERT,** *(suggested pilot action, if possible).*

12.19 AUTOMATIC DEPENDENT SURVEILLANCE – CONTRACT (ADS-C) PHRASEOLOGIES

12.19.1 **General ADS-C phraseologies**

Circumstances	Phraseologies
12.19.1.1 ADS-C degradation	**ADS-C (or ADS-CONTRACT) OUT OF SERVICE** (appropriate instructions as necessary)

CHAPTER 13

AUTOMATIC DEPENDENT SURVEILLANCE – CONTRACT (ADS -C) SERVICES

13.1 GENERAL

13.1.1 The provision of air traffic services to aircraft, based on information received from aircraft via ADS-C, is generally referred to as the provision of ADS-C services.

13.2 ADS-C GROUND SYSTEM CAPABILITIES

13.2.1 ADS-C ground systems used in the provision of air traffic services shall have a very high level of reliability, availability and integrity. The possibility of system failures or significant system degradations that may cause complete or partial interruptions of service shall be very remote. Back-up facilities shall be provided.

Note 1.— An ADS-C ground system will normally consist of a number of integrated elements, including communication interfaces, a data processing system and one or more controller interfaces.

13.2.2 ADS-C ground systems should be capable of integration with other automated systems used in the provision of ATS and should provide for an appropriate level of automation with the objectives of improving the accuracy and timeliness of data displayed to the controller and reducing controller workload and the need for verbal coordination between adjacent control positions and ATC units.

13.2.3 Several significant functional requirements are necessary to permit the effective implementation of an ADS-C service in a CNS/ATM environment. Ground systems shall provide for:

a) the transmitting, receiving, processing and displaying of ADS-C messages related to flights equipped for and operating within environments where ADS-C services are being provided;

b) the display of safety-related alerts and warnings;

c) position monitoring (the aircraft's current position as derived from ADS-C reports is displayed to the controller for air traffic situation monitoring);

d) conformance monitoring (the ADS-C reported current position or projected profile is compared to the expected aircraft position, which is based on the current flight plan. Along track, lateral and vertical deviations that exceed a pre-defined tolerance limit will permit an out-of-conformance alert to be issued to the controller);

e) flight plan update (e.g. longitudinal variations that exceed pre-defined tolerance limits will be used to adjust expected arrival times at subsequent fixes);

f) intent validation (intent data contained in ADS-C reports, such as extended projected profile, are compared with the current clearance and discrepancies are identified);

g) conflict detection (the ADS-C data can be used by the ADS-C ground system automation to identify violations of separation minima);

h) conflict prediction (the ADS-C position data can be used by the ADS-C ground system automation to identify potential violations of separation minima);

i) tracking (the tracking function is intended to extrapolate the current position of the aircraft based on ADS-C reports);

j) wind estimation (ADS-C reports containing wind data may be used to update wind forecasts and hence expected arrival times at waypoints); and

k) flight management (ADS-C reports may assist automation in generating optimum conflict-free clearances to support possible fuel-saving techniques, such as cruise climbs, requested by the operators).

Note.— The use of ADS-C does not relieve the controller of the obligation to continuously monitor the traffic situation.

13.2.4 The sharing of ADS-C information should be facilitated to the extent possible, in order to extend and improve surveillance in adjacent control areas, thereby reducing the need for additional ADS contracts to be supported by a given aircraft.

13.2.5 Automated exchange of coordination data relevant to aircraft being provided with an ADS-C service, and the establishment of automated coordination procedures shall be provided for on the basis of regional air navigation agreements.

13.2.6 Air traffic control facilities providing an ADS-C service shall be capable of storing and disseminating specific flight information relating to flights equipped for and operating within environments where an ADS-C service is provided.

13.2.7 Effective human-machine interfaces shall exist for the controller to permit appropriate utilization of the ADS-C-derived information and associated automated features.

13.3 USE OF ADS-C IN THE PROVISION OF AIR TRAFFIC CONTROL SERVICE

13.3.1 General

13.3.1.1 ADS-C may be used in the provision of an air traffic control service, provided identification of the aircraft is unambiguously established.

13.3.1.2 Flight data processing of ADS-C data may be used in the provision of an air traffic control service, provided the correlation between the ADS-C data downlinked by that aircraft and the flight plan details held for the aircraft has been accomplished.

Note.— A combination of information received from the aircraft may be necessary to ensure unambiguous correlation, e.g. departure aerodrome, estimated off-block time (EOBT), and destination aerodrome might be used.

13.3.1.3 Human Factors principles shall be observed. In particular, the controller shall be provided with enough information to:

a) maintain situational awareness; and

b) be capable of assuming, in the event of system malfunction, the minimum tasks for the provision of an air traffic control service, normally performed by automation.

Note 1:- Automated systems, while designed to provide high operational integrity, remain susceptible to error and failure. Human participation is integral to the safety of the air traffic system.

13.3.1.4 Information provided by the ground system may be used by the controller to perform the following functions in the provision of air traffic control services:

a) enhance safety;

b) maintain an accurate awareness of the air traffic situation;

c) apply separation minima;

d) take appropriate action regarding any significant deviation by aircraft from the terms of their respective air traffic control clearances, including their cleared routes, levels and speed when appropriate;

Note:- Where tolerances regarding such matters as adherence to 3-D position, speed or time have been prescribed in MATS- Part 2 deviations are not considered significant until such tolerances are exceeded.

e) provide updated position information regarding aircraft to other controllers when required; and

f) improve airspace utilization, reduce delays, as well as provide for direct routings and more optimum flight profiles.

13.3.2 Presentation of ADS-C data

13.3.2.1 Appropriate ADS-C data shall be presented to the controller in a manner suitable to achieve the control functions in 13.3.1.4. Display systems shall incorporate a situation display, textual information display, aural and visual alerts in such combinations as deemed appropriate.

13.3.2.2 Display systems may display actual ADS-C report information only or a combination of actual ADS-C report information and data derived from ADS-C reports. Additionally, display systems may incorporate surveillance information from a number of other sources, including data derived from radar, ADS-B, the flight data processing system (FDPS) and/or CPDLC or voice position reports.

13.3.2.2.1 Where surveillance information is derived from different sources, the type of surveillance shall be readily apparent to the controller.

13.3.2.3 ADS information available to the controller on a situation display shall, as a minimum, include ADS position indications and map information.

13.3.2.3.1 When applicable, distinct symbols should be used to differentiate presentation of position indications which are derived from:

a) ADS-C position reports; or
b) combinations of ADS-C with information derived from other surveillance sources, e.g. PSR, SSR, ADS-B; or
c) ADS-C extrapolations;

13.3.2.3.2 Labels used to provide ADS-C-derived information and any other information that may be available shall, as a minimum, be displayed in alphanumeric form.

13.3.2.3.3 Label information shall, as a minimum, include aircraft identification and level information. All label information shall be presented in a clear and concise manner. Labels shall be associated with their ADS-C position indications in a manner precluding erroneous identification.

13.3.2.4 When ADS-C reports are queued, the controller shall be given an indication that more urgent reports are available based on the following order of priority:

a) emergency and/or urgency mode ADS-C reports;
b) event or demand ADS-C reports; and then
c) periodic ADS-C reports.

13.3.2.4.1 If more than one ADS-C report is queued in any one of a), b) or c) above, they shall be handled in the order received.

13.3.2.5 Safety-related alerts and warnings, including emergency/urgent reports, shall be presented in a clear and distinct manner. Provisions shall be made for alerting the controller when expected ADS-C reports are not received within an appropriate time.

Note:- Non-receipt of ADS-C event contract reports may be undetectable.

13.3.3 Provision of ADS-C services

13.3.3.1 GENERAL

13.3.3.1.1 The number of aircraft simultaneously provided with ADS-C services shall not exceed that which can safely be handled under the prevailing circumstances, taking into account:

a) the complexity of the traffic situation and associated workload within the sector or area of responsibility of the controller;

b) the level of automation of the ADS-C ground system;

c) the overall technical performance of the ADS-C systems and communications systems, including possible degradations that would require use of back-up facilities;

d) the overall performance of the back-up surveillance and communications systems; and

e) the effect of loss of controller-pilot communications.

Note:- Further guidance on the factors to be considered can be found in the Manual of Air Traffic Services Data Link Applications *(Doc 9694).*

13.3.3.2 <u>*Coordination and transfer of control of ADS-C aircraft*</u>

13.3.3.2.1 Appropriate arrangements shall be made in and between any ATC units using ADS-C to ensure the coordination of ADS-C and non-ADS-C traffic and to ensure the provision of adequate separation between the ADS-C aircraft and all other aircraft.

13.3.3.2.2 Transfer of control shall be effected so as to facilitate uninterrupted provision of ADS-C services where ADS-C is available in adjacent ATC units.

13.3.3.2.3 The accepting ATC unit shall establish a contract with the affected aircraft prior to reaching the transfer of control point. Should the accepting ATC unit be unable to establish a contract, the transferring ATC unit shall be notified in order to provide ground forwarding of ADS-C data to permit an uninterrupted ADS-C service.

13.3.3.2.4 When an aircraft is in an emergency/urgency mode or is the subject of safety alerts or warnings, this information shall be provided to the accepting ATC unit, and the ADS contract shall not be terminated by the transferring ATC unit until appropriate coordination has been effected.

13.3.3.2.5 Transfer of control of aircraft between adjacent control positions or between adjacent ATC units may be effected as follows:

a) appropriate ADS-C transfer protocols are observed by:

   1) designation of the ADS-C position indication by automated means; or

   2) direct designation of the ADS-C position indication if two display systems are adjacent or if a common (conference) type of display is used; or

   3) designation of the ADS-C position indication by reference to a position

accurately indicated on both display systems;

b) updated flight plan information on the aircraft about to be transferred is provided to the accepting controller prior to transfer;

c) when controllers are not physically adjacent, direct communications facilities are available between them at all times;

Note:- This requirement may be met by two-way direct speech facilities or ATS interfacility data communications (AIDC).

d) the transfer point or points and all other conditions of application have been made the subject of specific instructions or a specific letter of agreement; and

e) the accepting controller is kept current of all control instructions (e.g. level or speed instructions) given to the aircraft prior to its transfer and which modify its anticipated flight progress.

Note:- This requirement may be met by two-way direct speech facilities or ATS interfacility data communications (AIDC).

13.3.3.2.6 The minimum agreed separation between aircraft about to be transferred shall be as specified in letters of agreement or local instructions, as appropriate.

13.3.3.3 Communications

13.3.3.3.1 Controller-pilot communications shall be such that the possibility of communications failure or significant degradations is very remote. Adequate back-up facilities shall be provided.

13.3.3.4 *General ADS procedures*

13.3.3.4.1 *ADS contract management*

13.3.3.4.1.1 Only appropriate ATC units shall initiate ADS contracts with a given aircraft. Procedures shall ensure that non-current contracts are terminated in a timely manner.

13.3.3.4.1.2 The ADS-C ground system shall be able to identify the ADS-C capability of the aircraft and establish appropriate ADS contracts with ADS-C-equipped aircraft.

13.3.3.4.1.3 ADS contracts necessary for the control of the aircraft will be established with each aircraft by the relevant ADS-C ground system, at least for the portions of the aircraft flight over which that ATC unit provides air traffic services.

13.3.3.4.1.4 The contract may include the provision of basic ADS-C reports at a periodic interval defined by the ADS-C ground system with, optionally, additional data containing specific information, which may or may not be sent with each periodic report. The agreement may also provide for ADS-C reports at geographically defined points such as waypoints, in addition to other specific event-driven reports.

13.3.3.4.1.5 The aircraft must be capable of supporting ADS-C agreements with at least four ATC unit ADS-C ground systems simultaneously.

13.3.3.4.1.5.1 When an ADS-C ground system attempts to establish an ADS-C agreement with an aircraft and is unable to do so due to the aircraft's inability to support an additional ADS contract, the aircraft should reply with the ICAO location indicators or eight-letter facility indicators of the ground systems with which it currently has contracts, in order for the ATC unit to negotiate a contract release. In the event that this information cannot be provided to the ground system, the ground system shall nevertheless alert the controller that an ADS agreement cannot be established. Coordination between the appropriate ATC units shall then be effected for the purpose of establishing priority for ADS-C connections with the aircraft.

13.3.3.4.1.6 An ATC unit shall be capable of replacing or terminating its own ADS contract(s) as required. An existing contract shall remain in place until any new contract of the same type is accepted by the aircraft or until the contract type is terminated.

13.3.3.4.2 *ADS-C termination*

13.3.3.4.2.1 ADS contracts may be terminated manually or automatically by the ADS-C ground system, based on agreements between ATS authorities for aircraft crossing FIR boundaries.

13.3.3.4.2.2 ATS authorities shall establish procedures to ensure that ADS contracts are reestablished as required when unplanned ADS-C termination occurs.

13.3.3.4.3 *ADS-C agreements*

13.3.3.4.3.1 Except as provided for in 13.3.3.4.3.2, initial ADS-C agreements shall be determined by the ATS authority. Subsequent modifications to individual contracts may be made at the discretion of the controller based on the prevailing traffic conditions and airspace complexity.

13.3.3.4.3.2 In airspace where procedural separation is being applied, ADS-C agreements shall, as a minimum, contain the following ADS contracts:

a) a periodic contract at an interval appropriate to the airspace requirements;

b) an event contract, specifying the following:

1) a waypoint change event contract;

2) a lateral deviation event contract; and

3) a level range deviation event contract.

Note 1— A vertical rate change event specified at, for example, a negative vertical rate (i.e. a descent) exceeding 5 000 ft/min, may provide an additional indication of an *abnormal situation.*

13.3.3.4.3.3 Upon receipt of an event report indicating a deviation from the clearance, the ATC unit shall establish a periodic contract at a reduced reporting interval, as deemed appropriate, requesting the ground vector data block in addition to basic ADS-C data block. The ATC unit shall advise the flight crew of the observed deviation and ascertain its intention using CPDLC or voice, as appropriate.

13.3.3.4.3.4 The reduced ADS-C periodic reporting interval shall be retained until the aircraft has resumed its clearance, at which time the event contract shall be re-established and the normal periodic contract restored. Action should be taken by the ATC unit to notify proximate aircraft if appropriate.

13.3.3.4.3.5 When the application of specified separation minima is dependent on the reporting interval of periodic position reports, the ATC unit shall not establish periodic contracts with a reporting interval greater than the required reporting interval.

13.3.3.4.3.6 Where an expected position report is not received within a prescribed time parameter, action shall be taken, as appropriate, to ascertain the position of the aircraft. This may be achieved by the use of an ADS demand contract, CPDLC or voice communications, or receipt of a subsequent periodic report.

13.3.3.4.4 *Performance checks*

13.3.3.4.4.1 An ATC unit providing an ADS-C service to an aircraft, shall check the ADS-C three-dimensional position information received from that aircraft through pilot reports and/or flight plan conformance.

13.3.3.4.4.2 The pilot of the aircraft whose ADS-C derived position information is within the approved tolerance value as specified in MATS-Part 2, need not be advised of such verification.

13.3.3.4.4.3 If the displayed position information is not within the approved tolerance value, or when a discrepancy in excess of the approved tolerance value is detected subsequent to verification, the pilot shall be advised accordingly and requested to check the aircraft's navigation system.

13.3.3.4.4.4 The controller shall adjust the display(s) and carry out adequate checks on the accuracy thereof, in accordance with instructions prescribed in MATS- Part 2.

13.3.3.4.4.5 The controller shall be satisfied that the functional capabilities of the ADS-C display system or integrated display system, as well as the information displayed, is adequate for the functions to be performed.

13.3.3.4.4.6 The controller shall report, in accordance with local procedures or as specified in MATS-Part 2, any fault in the equipment or any incident requiring investigation or any circumstances which make it difficult or impractical to provide services on the basis of displayed ADS-C positions.

13.3.3.4.5 *Emergency and/or urgency reports*

Note:- To indicate that it is in a state of emergency or the state of emergency is terminated, an aircraft equipped with ADS-C might operate the emergency mode as follows:

a) emergency; and

b) emergency cancelled

13.3.3.4.5.1 When an ADS-C report is received with an emergency status indication, the controller with responsibility for the flight must acknowledge receipt of the information by the most appropriate means of communication.

13.3.3.4.5.2 Both the aircraft and the ADS-C ground system shall be capable of supporting an emergency mode of ADS-C operation to assist ATC alerting procedures and to assist search and rescue operations. In the event of an aircraft in, or appearing to be in, any form of emergency, all possible assistance shall be provided by the controller.

Note:- The ADS-C airborne system will provide for a pilot-initiated emergency mode. It may also permit the aircraft to automatically establish the emergency mode.

13.3.3.4.5.3 The ADS-C ground system shall recognize the initiation, modification and termination of an emergency mode and alert the controller. The ADS-C ground system shall be able to modify the emergency reporting rate if necessary. The ADS-C ground system shall be able to suppress an emergency indication.

13.3.3.4.6 *Failure of equipment*

Note:-It is not expected that the pilot will be made aware of any failure of ADS-C by means of on-board monitoring equipment.

13.3.3.4.6.1 *ADS-C airborne system failure*

13.3.3.4.6.1.1 On receipt of an airborne failure notification, the controller will:

a) advise the pilot of the failure;

b) advise the pilot of the requirement for position reports via voice or CPDLC; and

c) take necessary action to establish alternative separation, if required.

13.3.3.4.6.1.2 When an aircraft experiencing ADS-C failure after departure is operating or expected to operate in an area where the carriage of functional ADS-C with specified capabilities is mandatory, the ATC units concerned should endeavour to provide for continuation of the flight to the aerodrome of first intended landing in accordance with the flight plan. However, under some circumstances, continuation of the flight may not be possible due to traffic or airspace configuration. The aircraft may then be required to return to the departure aerodrome or to land at the nearest suitable aerodrome acceptable to the operator concerned.

13.3.3.4.6.1.3 In the case of an ADS-C failure that is detected before departure from an aerodrome where it is not practicable to effect a repair, the aircraft concerned should be permitted to proceed, as directly as possible, to the nearest suitable aerodrome where repair can be made. When granting clearance to such aircraft, the air traffic control unit should take into consideration the existing or anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight. Subsequent adjustments may become necessary during the course of the flight.

13.3.3.4.6.2 *ADS-C ground system shutdown*

13.3.3.4.6.2.1 When a planned shutdown of the ADS-C ground system occurs:

a) a NOTAM shall be published to inform all affected parties of the shutdown period;

b) position reports via voice or CPDLC shall be stipulated; and

c) alternative separation shall be established, if required.

13.3.3.4.6.2.2 In the event of an unplanned ADS-C ground system shutdown, the relevant ATS provider shall:

a) inform all affected aircraft and advise them of the requirement for position reports via voice or CPDLC;

b) take necessary action to establish alternative separation, if required;

c) inform the adjacent ATS unit(s) by direct coordination; and

d) inform all other relevant parties via the publication of a NOTAM, if appropriate.

13.4 USE OF ADS-C IN THE APPLICATION OF SEPARATION MINIMA

13.4.1 General

Note.— In an ADS-C-based air traffic control (ATC) system, the accuracy of the positional information displayed to the controller is dependent upon the aircraft's on-board navigation or positioning system. Therefore, any aircraft system degradation that affects the aircraft's navigational capabilities will also affect the accuracy of the positional data displayed to the controller.

13.4.1.1 The procedures and minima in this section are applicable when ADS-C is used in the provision of air traffic control services.

13.4.1.1.1 The use of ADS-C position reports to ensure separation shall only be applied when there is a reasonable assurance that the provision of ADS-C reports will not be interrupted.

13.4.2 Determination of level occupancy

13.4.2.1 The tolerance value which shall be used to determine that the ADS-C level information displayed to the controller is accurate shall be ± 200 ft in RVSM airspace. In other airspace, it shall be ± 300 ft, except that appropriate ATS authorities may specify a smaller criterion, but not less than ± 200 ft, if this is found to be more practical.

13.4.2.2 If the ADS-C level information is not within the approved tolerance value, the information must be validated by voice or CPDLC. Where it has been established that the ADS-C level information is incorrect, the appropriate ATS authority shall determine the action to be taken regarding the display and use of this information.

13.4.2.3 An aircraft cleared to leave a level is considered to have commenced its manoeuvre and vacated the previously occupied level when the ADS level information indicates a change of more than 300 ft in the anticipated direction from its previously assigned level, or verification has been made by receipt of a CPDLC or voice report from the pilot.

13.4.2.4 An aircraft that is climbing or descending is considered to have crossed a level when the ADS-C level information indicates that it has passed this level in the required direction by more than 300 ft or that verification has been made by receipt of a CPDLC or voice report from the pilot.

13.4.2.5 An aircraft that is climbing or descending is considered to have reached the level to which it has been cleared when verification has been made by receipt of the assigned level by CPDLC or a voice report from the pilot. The aircraft may then be considered to be maintaining this level for as long as the ADS-C level information remains within the appropriate tolerance values as specified in 13.4.2.1.

Note.— A level range deviation event contract may be used to monitor the continued compliance of the aircraft with the appropriate level tolerance values.

13.4.2.5.1 When CPDLC is to be used to verify that the aircraft has reached the level to which it has been cleared, the uplink message No. 129, REPORT MAINTAINING *(level),* or uplink message No. 200, REPORT REACHING, should be used.

Note.— Uplink message No. 175, REPORT REACHING (level), does not provide the same assurance that the aircraft has maintained the assigned level. On those occasions where the flight management system has been loaded by the pilot to reply automatically to this message, the reply may be sent when the aircraft reaches the assigned level, irrespective of whether the aircraft maintains the assigned level.

13.4.2.6 Where it is intended to provide vertical separation below a transition level using ADS-C level information, the appropriate authority shall ensure that such information is corrected to the appropriate barometric altitude.

13.4.3 Application of horizontal separation using ADS-C position information

Note 1.— Factors that the ADS controller must take into account in determining the spacing to be applied in particular circumstances in order to ensure that the separation minimum is not infringed include aircraft relative headings and speeds, ADS-C technical limitations, controller workload and any difficulties caused by communications congestion.

13.4.3.1 Contingency procedures to be followed in the event of degradation of ADS-C information due to a loss of the required navigation performance accuracy shall be specified in MATS-Part 2.

13.4.3.2 Distance-based separation minima for use with ADS-C may be applied between ADS-C-derived aircraft positions, or between ADS-C-derived positions and radar or ADS-B-derived positions. The positions of the aircraft shall be extrapolated or interpolated, as necessary, to ensure that they represent the positions of the aircraft at a common time.

13.4.3.2.1 Displayed ADS-C position symbols should enable the controller to distinguish between reported, extrapolated or interpolated positions. When there is any doubt regarding the integrity of the information displayed as an extrapolated or interpolated position symbol, it shall be updated by a demand contract request.

13.5.3.2.2 ADS-C-based separation shall not be applied between aircraft holding over the same holding fix. Application of horizontal separation between holding aircraft and other flights shall be subject to requirements and procedures prescribed by the appropriate ATS authority.

13.5.3.3 Information derived from the display of ADS-C information shall not be used to vector an aircraft.

CHAPTER 14

CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)

14.1 General

14.1.1 CPDLC provides a means of communication between the controller and pilot, using the CPDLC message set for ATC communication.

14.1.2 This application includes a set of clearance / information / request message elements which correspond to the phraseologies used in the radiotelephony environment.

Note 1.— See Appendix 5 of PANS-ATM Doc 4444, for the CPDLC message set which lists the message elements and their respective message intended use.

Note 2.— Message element intent and text and associated procedures are, in general, consistent with Chapter 12 — Phraseologies. It is, however, recognized that the CPDLC message set and the associated procedures differ somewhat from the voice equivalent used because of the differences between the two media.

14.1.3 The pilot and the controller shall be provided with the capability to exchange messages which include standard message elements, free text message elements or combinations of both.

14.1.4 Ground and airborne systems shall allow for messages to be appropriately displayed, printed when required and stored in a manner that permits timely and convenient retrieval should such action be necessary.

14.2 Establishment of CPDLC

14.2.1 General

14.2.1.1 CPDLC shall be established in sufficient time to ensure that the aircraft is communicating with the appropriate ATC unit. Information concerning when and, where applicable, where, the air or ground systems should establish CPDLC, shall be published in Aeronautical Information Publications.

14.2.2 Airborne-initiated CPDLC

14.2.2.1 When an ATC unit receives an unexpected request for CPDLC from an aircraft, the circumstances leading to the request shall be obtained from the aircraft to determine further action.

14.2.2.2 When the ATC unit rejects a request for CPDLC, it shall provide the pilot with the reason for the rejection using an appropriate CPDLC message.

14.2.3 ATC unit-initiated CPDLC

14.2.3.1 An ATC unit shall only establish CPDLC with an aircraft if the aircraft has no CPDLC link established, or when authorized by the ATC unit currently having CPDLC established with the aircraft.

14.2.3.2 When a request for CPDLC is rejected by an aircraft, the reason for the rejection shall be provided using CPDLC down link message element NOT CURRENT DATA AUTHORITY or message element NOT AUTHORIZED NEXT DATA AUTHORITY or ICAO FACILITY DESIGNATION of CURRENT DATA AUTHORITY, as appropriate. Local procedures/MATS 2 shall dictate whether the reason for rejection is presented to the controller. No other reasons for airborne rejection of ATC unit-initiation of CPDLC shall be permitted

14.3 Exchange of operational CPDLC messages

14.3.1 General

14.3.1.1 The controller or pilot shall construct CPDLC messages using the standard message elements, free text message elements or a combination of both.

14.3.1.2 The use of long messages or messages with multiple clearance elements, multiple clearance request elements or messages with a combination of clearances and information should be avoided where possible.

14.3.1.3 When CPDLC is being used, and the intent of the message is included in the CPDLC message set contained in Appendix 5 PANS ATM DOC 4444, the associated standard message elements shall be used.

14.3.1.4 Except as provided by 14.3.5.1, when a controller or pilot communicates via CPDLC, the response should be via CPDLC. When a controller or pilot communicates via voice, the response should be via voice.

14.3.1.5 Whenever a correction to a message sent via CPDLC is deemed necessary or the contents of a message needs to be clarified, the controller or pilot shall use the most appropriate means available for issuing the correct details or for providing clarification.

Note.— The following procedures may be applied by the controller, in terms of correcting clearances, instructions or information, or by a pilot, in terms of correcting a reply to an uplink message or correcting previously advised requests or information.

14.3.1.5.1 When voice communications are used to correct a CPDLC message for which no operational response has yet been received, the controller's or pilot's transmission shall be prefaced by the phrase: "DISREGARD CPDLC *(message type)* MESSAGE, BREAK" — followed by the correct clearance, instruction, information or request.

Note.— It is possible that, at the time the voice communicated clarification is transmitted, *the CPDLC message being referred to has not yet reached the recipient, or has reached the recipient but not acted upon, or has reached the recipient and acted upon.*

14.3.1.5.2 When referring to, and identifying, the CPDLC message to be disregarded, caution should be exercised in its phrasing so as to avoid any ambiguity with the issuance of the accompanying corrected clearance, instruction, information or request.

Note.— For example, if SAS445, maintaining FL290, had been instructed via CPDLC to climb to FL350, and the controller needs to correct the clearance utilizing voice communications, the following phrase might be used:

SAS445 DISREGARD CPDLC CLIMB CLEARANCE MESSAGE, BREAK, CLIMB TO FL310.

14.3.1.5.3 If a CPDLC message that requires an operational response is subsequently negotiated via voice, an appropriate CPDLC message closure response shall be sent, to ensure proper synchronization of the CPDLC dialogue. This could be achieved either by explicitly instructing the recipient of the message via voice to close the dialogue or by allowing the system to automatically close the dialogue.

14.3.2 Attributes of CPDLC message

Message attributes dictate certain message hand-ling requirements for the CPDLC user receiving a message. Each CPDLC message has three attributes: Urgency, Alert and Response.

14.3.2.1 <u>*ALERT*</u>

14.3.2.1.1 The alert attribute delineates the type of alerting required upon message receipt. Alert types are presented in following table (14-1):

Type	***Description***	***Precedence***
H	High	1
M	Medium	2
L	Low	3
N	No alerting required	4

Table 14-1: Alert attribute (uplink and downlink)

14.3.2.2 <u>*RESPONSE*</u>

14.3.2.2.1 The response attribute delineates valid responses for a given message element. Response types for uplink messages are presented in Table 14-2 for uplink messages and Table 14-3 for downlink messages.

14.3.2.2.2 When a multi-element message requires a response, the response shall apply to all message elements.

Note.— For example, given a multi-element message containing CLIMB TO FL310 MAINTAIN MACH .84, a WILCO response applies to, and indicates compliance with, both elements of the message.

14.3.2.2.3 When a single message element clearance or any part of a multi-element clearance message cannot be complied with, the pilot shall send an UNABLE response for the whole message.

14.3.2.2.4 The controller shall respond with an UNABLE message that applies to all elements of the request when no element(s) of a single or multi-element clearance request can be approved. The current clearance(s) shall not be restated.

14.3.2.2.5 When a multi-element clearance request can only be partially accommodated, the controller shall respond with an UNABLE message applying to all the message elements of the request and, if appropriate, include a reason and/or information on when a clearance may be expected.

Note.— A separate CPDLC message (or messages) may subsequently be transmitted to respond to those elements that can be accommodated.

14.3.2.2.6 When all elements of a single or multi-element clearance request can be accommodated, the controller shall respond with clearances corresponding to each element of the request. This response should be a single uplink message.

Note.— For example, while messages containing multi-element clearance requests are to be avoided, a multi-element downlink message containing the indicated message elements:

REQUEST CLEARANCE YQM YYG YYT YQX TRACK X EINN EDDF

REQUEST CLIMB TO FL350

REQUEST MACH 0.84

could be responded to with:

CLEARED YQM YYG YYT YQX TRACK X EINN EDDF

CLIMB TO FL350

REPORT MAINTAINING

CROSS YYG AT OR AFTER 1150

NO SPEED RESTRICTION

14.3.2.2.7 When a CPDLC message contains more than one message element and the response attribute for the message is Y, when utilized, the single response message shall contain the corresponding number of replies and in the same order.

Note.— For example, a multi-element uplink message containing

CONFIRM SQUAWK

WHEN CAN YOU ACCEPT FL410

could be responded to with:

SQUAWKING 5525

WE CAN ACCEPT FL410 AT 1636Z.

14.3.2 Transfer of CPDLC

14.3.3.1 When CPDLC is transferred, the transfer of voice communications and CPDLC shall commence concurrently.

14.3.3.2 When an aircraft is transferred from an ATC unit where CPDLC is available to an ATC unit where CPDLC is not available, CPDLC termination shall commence concurrent with the transfer of voice communications.

14.3.3.3 When a transfer of CPDLC results in a change of data authority, and there are still messages for which the closure response has not been received (i.e. messages outstanding), the controller transferring the CPDLC shall be informed.

14.3.3.3.1 If the controller needs to transfer the aircraft without replying to any downlink message(s) outstanding, the system shall have the capability to automatically send the appropriate closure response message(s). In such cases, the contents of any automatically sent closure response message(s) shall be promulgated in local instructions MATS- Part 2.

14.3.3.3.2 When the controller decides to transfer the aircraft without receiving pilot responses to any uplink message(s) outstanding, the controller should revert to voice communications to clarify any ambiguity associated with the message(s) outstanding.

Type	Response required	Valid responses	Precedence
W/U	Yes	WILCO, UNABLE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	1
		AFFIRM, NEGATIVE, STANDBY,	

A/N	Yes	NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	2
R	Yes	ROGER, UNABLE, STANDBY, NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, LOGICAL ACKNOWLEDGEMENT (only if required), ERROR	3
Y	Yes	Any CPDLC downlink message, LOGICAL ACKNOWLEDGEMENT (only if required)	4
N	No, unless logical acknowledgement required	LOGICAL ACKNOWLEDGEMENT (only if required), NOT CURRENT DATA AUTHORITY, NOT AUTHORIZED NEXT DATA AUTHORITY, ERROR	5

Table 14-2: Response attribute (uplink)

Type	Response required	Valid responses	Precedence
Y	Yes	Any CPDLC uplink message, LOGICAL ACKNOWLEDGEMENT (only if required)	1
N	No, unless logical acknowledgement required	LOGICAL ACKNOWLEDGEMENT (only if required), MESSAGE NOT SUPPORTED BY THIS ATC UNIT, ERROR	2

Table 14-3: Response attribute (downlink)

14.3.3 Free text messages elements

14.3.4.1 The use of free text message elements by controllers or pilots, should be avoided.

Note .— While it is recognized that non-routine and emergency situations may necessitate *use of free text, avoidance of utilizing free text messages is intended to reduce the possibility of misinterpretation & ambiguity.*

14.3.4.2 When determined acceptable by the appropriate ATS authority to use free text message elements, free text message elements should be stored for selection within the aircraft system or ground system to facilitate their use.

14.3.5 Emergencies, hazards and equipment failure procedures

14.3.5.1 When a CPDLC emergency message is received, the controller shall acknowledge receipt of the message by the most efficient means available.

14.3.5.2 When responding via CPDLC to all other emergency or urgency messages, uplink message ROGER shall be used.

14.3.5.3 When a CPDLC message requires a logical acknowledgment and/or an operational response, and such a response is not received, the pilot or controller, as appropriate shall be alerted.

14.3.6 Failure of CPDLC

14.3.6.1 The controller and pilot shall be alerted to the failure of CPDLC as soon as the failure has been detected.

14.3.6.2 When a controller or pilot is alerted that CPDLC has failed, and the controller or pilot needs to communicate prior to CPDLC being restored, the controller or pilot should revert to voice, if possible, and preface the information with the phrase: ***CPDLC FAILURE.***

14.3.6.3 Controllers having a requirement to transmit information concerning a complete CPDLC ground system failure to all stations likely to intercept, should preface such transmission by the general call ***ALL STATIONS CPDLC FAILURE***, followed by the identification of the calling station.

Note.— No reply is expected to such general calls unless individual stations are subsequently called to acknowledge receipt.

14.3.6.4 When CPDLC fails and communications revert to voice, all CPDLC messages outstanding should be considered not delivered and the entire dialogue involving the messages outstanding should be recommenced by voice.

14.3.6.5 When CPDLC fails but is restored prior to a need to revert to voice communications, all messages out-standing should be considered not delivered and the entire dialogue involving the messages outstanding should be recommenced via CPDLC.

14.3.7 Intentional shutdown of CPDLC

14.3.7.1 When a system shutdown of the communications network or the CPDLC ground system is planned, a NOTAM shall be published to inform all affected parties of the shutdown period and, if necessary, the details of the voice communication frequencies to be used.

14.3.7.2 Aircraft currently in communication with the ATC unit shall be informed by voice or CPDLC of any imminent loss of CPDLC service.

14.3.8 Failure of a single CPDLC message

14.3.8.1 When a controller or pilot is alerted that a single CPDLC message has failed, the controller or pilot shall take one of the following actions as appropriate:

a) via voice, confirm the actions that will be undertaken with respect to the related dialogue, prefacing the information with the phrase:

CPDLC MESSAGE FAILURE;

b) via CPDLC, reissue the CPDLC message that failed.

14.3.9 Discontinuation of the use of CPDLC pilot requests

14.3.9.1 When a controller requires all stations or a specific flight to avoid sending CPDLC requests for a limited period of time, the following phrase shall be used:

(*(call sign) or* ALL STATIONS) STOP SENDING CPDLC REQUESTS [UNTIL ADVISED] [*(reason)*]

Note.— Under these circumstances, CPDLC remains available for the pilot to respond, if necessary, respond to messages, to report information and, to declare and cancel an emergency.

14.3.9.2 The resumption of the normal use of CPDLC shall be advised by using the following phrase:

(*(call sign) or* ALL STATIONS) RESUME NORMAL CPDLC OPERATIONS

14.3.10 Testing of CPDLC

Where the testing of CPDLC with an aircraft could affect the air traffic services being provided to the aircraft, coordination shall be effected prior to such testing.

CHAPTER 15

PROCEDURES RELATING TO EMERGENCIES, COMMUNICATION FAILURE AND CONTIGENCIES

15.1 EMERGENCY PROCEDURES

15.1.1 General

15.1.1.1 The various circumstances surrounding each emergency situation preclude the establishment of exact detailed procedures to be followed. The procedures outlined herein are intended as a general guide to air traffic services personnel. Air traffic control units shall maintain full and complete coordination, and personnel shall use their best judgement in handling emergency situations.

Note 1.— Additional procedures to be applied in relation to emergencies and contingencies whilst using an ATS surveillance system are described below:

15.1.1.2 In the event of an aircraft in, or appearing to be in, any form of emergency, every assistance shall be provided by the controller, and the procedures prescribed herein may be varied according to the situation.

i) The progress of an aircraft in emergency shall be monitored and (whenever possible) plotted on the situation display until the aircraft passes out of coverage of the ATS surveillance system, and position information shall be provided to all air traffic services units which may be able to give assistance to the aircraft. Transfer to adjacent sectors shall also be effected when appropriate.

ii) Whenever a general ADS-B emergency alert is observed on the situation display and there is no other indication of the particular nature of the emergency, the controller shall take the following action*:*

a) attempt to establish communication with the aircraft to verify the nature of the emergency; or

b) if no response is received from the aircraft, the controller shall attempt to ascertain if the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed on the situation display.

Note 2:— If the pilot of an aircraft encountering a state of emergency has previously been directed by ATC to select a specific transponder code and/or a specific ADS-B emergency mode, that code/mode will normally be maintained unless, in special circumstances, the pilot has decided or has been advised otherwise. Where ATC has not requested a code or emergency mode to be set, the pilot will set the transponder to Mode

A Code 7700 and/or the appropriate ADS-B emergency mode.

15.1.1.3 When an emergency is declared by an aircraft, the ATS unit should take appropriate and relevant action as follows:

a) unless clearly stated by the flight crew or otherwise known, take all necessary steps to ascertain aircraft identification and type, the type of emergency, the intentions of the flight crew as well as the position and level of the aircraft;

b) decide upon the most appropriate type of assistance which can be rendered;

c) enlist the aid of any other ATS unit or other services which may be able to provide assistance to the aircraft;

d) provide the flight crew with any information requested as well as any additional relevant information, such as details on suitable aerodromes, minimum safe altitudes, weather information;

e) obtain from the operator or the flight crew such of the following information as may be relevant: number of persons on board, amount of fuel remaining, possible presence of hazardous materials and the nature thereof; and

f) notify the appropriate ATS units and authorities as specified in local instructions.

15.1.1.4 Changes of radio frequency and SSR code should be avoided if possible and should normally be made only when or if an improved service can be provided to the aircraft concerned. Manoeuvring instructions to an aircraft experiencing engine failure should be limited to a minimum. When appropriate, other aircraft operating in the vicinity of the aircraft in emergency should be advised of the circumstances.

Note:- Requests to the flight crew for the information contained in 15.1.1.3 e) will be made only if the information is not available from the operator or from other sources and will be limited to essential information.

15.1.2 Priority

15.1.2.1 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.

15.1.3 Unlawful interference and aircraft bomb threat

15.1.3.1 Air traffic services personnel shall be prepared to recognize any indication of the occurrence of unlawful interference with an aircraft.

Note:- An aircraft equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7500 to indicate specifically that it is the subject of *unlawful interference. The aircraft may operate the transponder on Mode A Code 7700, to indicate that it is threatened by grave and imminent danger and requires immediate assistance. An aircraft equipped with other surveillance system transmitters, including ADS-B and ADS-C, might send the emergency and/or urgency signal by all of the available means.*

15.1.3.2 Whenever unlawful interference with an aircraft is known or suspected or a bomb threat warning has been received, ATS units shall promptly attend to requests by, or to anticipated needs of, the aircraft, including requests for relevant information relating to air navigation facilities, procedures and services along the route of flight and at any aerodrome of intended landing, and shall take such action as is necessary to expedite the conduct of all phases of the flight, especially the safe landing of the aircraft.

15.1.3.2.1 ATS units shall also:

a) transmit, and continue to transmit, information pertinent to the safe conduct of the flight, without expecting a reply from the aircraft;

b) monitor and plot the progress of the flight with the means available, and coordinate transfer of control with adjacent ATS units without requiring transmissions or other responses from the aircraft, unless communication with the aircraft remains normal;

c) inform, and continue to keep informed, appropriate ATS units, including those in adjacent FIRs, which may be concerned with the progress of the flight;

Note.— In applying this provision, account must be taken of all the factors which may affect the progress of the flight, including fuel endurance and the possibility of sudden changes in route and destination. The objective is to provide, as far in advance as is practicable in the circumstances, each ATS unit with appropriate information as to the expected or possible penetration of the aircraft into its area of responsibility.

d) notify:

   1) the operator or its designated representative;

   2) the appropriate rescue coordination centre in accordance with appropriate alerting procedures;

   3) the appropriate authority designated by the state;

e) relay appropriate messages, relating to the circumstances associated with the unlawful interference, between the aircraft and designated authorities.

Note.—Follow procedures enumerated in Contingency Plan to deal with Unlawful Interference.

15.1.3.3 The following additional procedures shall apply if a threat is received indicating that a bomb or other explosive device has been placed on board a known aircraft. The ATS unit receiving the threat information shall:

a) if in direct communication with the aircraft, advise the flight crew without delay of the threat and the circumstances surrounding the threat; or

b) if not in direct communication with the aircraft, advise the flight crew by the most expeditious means through other ATS units or other channels.

15.1.3.4 The ATS unit in communication with the aircraft shall ascertain the intentions of the flight crew and report those intentions to other ATS units which may be concerned with the flight.

15.1.3.5 The aircraft shall be handled in the most expeditious manner whilst ensuring, to the extent possible, the safety of other aircraft and that personnel and ground installations are not put at risk.

15.1.3.6 Aircraft in flight shall be given re-clearance to a requested new destination without delay. Any request by the flight crew to climb or descend for the purpose of equalizing or reducing the differential between the outside air pressure and the cabin air pressure shall be approved as soon as possible.

15.1.3.7 An aircraft on the ground should be advised to remain as far away from other aircraft and installations as possible and, if appropriate, to vacate the runway. The aircraft should be instructed to taxi to a designated or isolated parking area in accordance with local instructions. Should the flight crew disembark passengers and crew immediately, other aircraft, vehicles and personnel should be kept at a safe distance from the threatened aircraft.

15.1.3.8 ATS units shall not provide any advice or suggestions concerning action to be taken by the flight crew in relation to an explosive device.

15.1.3.9 An aircraft known or believed to be the subject of unlawful interference or which for other reasons needs isolation from normal aerodrome activities shall be cleared to the designated isolated parking position. Where such an isolated parking position has not been designated, or if the designated position is not available, the aircraft shall be cleared to a position within the area or areas selected by prior agreement with the aerodrome authority. The taxi clearance shall specify the taxi route to be followed to the parking position. This route shall be selected with a view to minimizing any security risks to the public, other aircraft and installations at the aerodrome.

15.1.4 Emergency descent

15.1.4.1 Action by the ATS unit

15.1.4.1 Upon recognition that an aircraft is making an emergency descent, appropriate action shall be taken immediately to safeguard all aircraft concerned. Appropriate actions may include the following, in the order appropriate for the circumstance:

a) broadcasting an emergency message;

Phraseology:

ATTENTION ALL AIRCRAFT IN THE VICINITY OF (or AT) (*significant point or location*) EMERGENCY DESCENT IN PROGRESS FROM (*level*) (*followed as necessary by specific instructions, clearance, traffic information etc.)*

b) issuing traffic information and/or instructions to aircraft affected by the descent;

c) advising the minimum flight altitude and altimeter setting for the area of operation; and

d) informing any other ATS units which may be affected by the emergency descent

15.1.4.2 Action by the pilot of the aircraft in emergency descent

15.1.4.2.1 The pilot shall take the following steps as soon as practicable in the order appropriate for the circumstance:

a) navigate as deemed appropriate by the pilot;

b) advise the appropriate ATS unit of the emergency descent and if able intentions;

c) set transponder to Code 7700 and, if applicable, select the appropriate emergency mode on ADS-B and/or ADS-C;

d) turn on aircraft exterior lights (commensurate with appropriate operating limitations);

e) watch for conflicting traffic both visually and by reference to ACAS (if equipped); and

f) when emergency descent is complete, coordinate further intentions with the appropriate ATS unit.

15.1.4.3 Action by the pilot of aircraft receiving emergency descent broadcast

15.1.4.3.1 Unless specifically instructed by the ATS unit to clear the area or threatened by immediate danger, the pilot shall take the following actions:

a) continue according to current clearance and maintain listening watch on the frequency in use for any further instructions from the ATS unit; and

b) watch for conflicting traffic both visually and by reference to ACAS (if equipped).

15.2 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE OF CHENNAI, KOLKATA AND MUMBAI FIR

15.2.1 Introduction

15.2.1.1 Although all possible contingencies cannot be covered, the procedures in 15.2.2 and 15.2.3 provide for the more frequent cases such as:

a) inability to comply with assigned clearance due to meteorological conditions, aircraft performance or pressurization failure;

b) en route diversion across the prevailing traffic flow; and

c) loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations.

15.2.1.2 With regard to 15.2.1.1 a) and b), the procedures are applicable primarily when descent and/or turn-back or diversion is required. The pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgment shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

15.2.2 General procedures

15.2.2.1 If an aircraft is unable to continue the flight in accordance with its ATC clearance, and/or an aircraft is unable to maintain the navigation performance accuracy specified for the airspace, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

15.2.2.2 The radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times shall be used as appropriate. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and the overall air traffic situation.

15.2.2.3 If prior clearance cannot be obtained, until a revised clearance is received the following contingency procedures should be employed and the pilot shall advise air traffic control as soon as practicable, reminding them of the type of aircraft involved and the nature of the problem. In general terms, the aircraft should be flown at a flight level and on an offset track where other aircraft are least likely to be encountered. Specifically, the pilot shall:

a) leave the assigned route or track by initially turning at least 45° to the right or to the left, in order to acquire a same or opposite direction track offset 15 NM from the assigned track centreline. When possible, the direction of the turn should be determined by the position of the aircraft relative to any organized route or track system. Other factors which may affect the direction of the turn are:

   1) the direction to an alternate airport,

   2) terrain clearance;

   3) any strategic lateral offset being flown, and

   4) the flight levels allocated on adjacent routes or tracks.

b) having initiated the turn:

   1) if unable to maintain the assigned flight level, initially minimize the rate of descent to the extent that is operationally feasible (pilots should take

into account the possibility that aircraft below on the same track may be flying a 1 or 2 NM strategic lateral offset procedure (SLOP)) and select a final altitude which differs from those normally used by 500 ft if at or below FL 410, or by 1000 ft if above FL 410; or

2) if able to maintain the assigned flight level, once the aircraft has deviated 10 NM from the assigned track centreline, climb or descend to select a flight level which differs from those normally used by 500 ft , if at or below FL 410, or by 1000 ft if above FL 410;

c) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals on 121.5 MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45 MHz) and where appropriate on the frequency in use: aircraft identification, flight level, position (including the ATS route designator or the track code, as appropriate) and intentions;

d) maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped);

e) turn on all aircraft exterior lights (commensurate with appropriate operating limitations); and

f) keep the SSR transponder on at all times.

15.2.2.3.1 When leaving the assigned track:

a) if the intention is to acquire a same direction offset track, the pilot should consider limiting the turn to a 45° heading change, in order not to overshoot the offset contingency track; or

b) if the intention is to acquire and maintain an opposite direction offset track, then:

1) operational limitations on bank angles at cruising altitudes will normally result in overshooting the track to be acquired. In such cases a continuous turn should be extended beyond 180 degrees heading change, in order to re-intercept the offset contingency track as soon as operationally feasible; and

2) furthermore, if executing such a turnback in a 30 NM lateral separation route structure, extreme caution pertaining to opposite direction traffic on adjacent routes must be exercised and any climb or descent, as specified in 15.2.2.3 b) 2), should be completed preferably before approaching within 10 NM of any adjacent ATS route.

15.2.2.4 *Extended range operations by aeroplanes with two-turbine power-units (ETOPS)*

15.2.2.4.1 If the contingency procedures are employed by a twin-engine aircraft as a result of an engine shutdown or failure of an ETOPS critical system, the pilot should advise ATC as soon as practicable of the situation, reminding ATC of the type of aircraft involved, and request expeditious handling.

15.2.3 Weather deviation procedures

15.2.3.1 *General*

Note.— The following procedures are intended for deviations around adverse meteorological conditions.

15.2.3.1.1 When the pilot initiates communications with ATC, a rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response. When necessary, the pilot should initiate the communications using the urgency call "PAN PAN" (preferably spoken three times).

15.2.3.1.2 The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

15.2.3.2 *Actions to be taken when controller-pilot communications are established*

15.2.3.2.1 The pilot should notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected.

15.2.3.2.2 ATC should take one of the following actions:

a) when appropriate separation can be applied, issue clearance to deviate from track; or

b) if there is conflicting traffic and ATC is unable to establish appropriate separation, ATC shall:

   1) advise the pilot of inability to issue clearance for the requested deviation;

   2) advise the pilot of conflicting traffic; and

   3) request the pilot's intentions.

Phraseology:

UNABLE, TRAFFIC (*direction*) BOUND (*type of aircraft*) (*level*) ESTIMATED (or OVER) (*significant point*) AT (*time*) CALL SIGN(*call sign*) ADVISE INTENTIONS.

15.2.3.2.3 The pilot should take the following actions:

a) comply with the ATC clearance issued; or

b) advise ATC of intentions and execute the procedures detailed in 15.2.3.3

15.2.3.3 *Actions to be taken if a revised ATC clearance cannot be obtained*

Note.— The provisions of this section apply to situations where a pilot needs to exercise *the authority of a pilot-in-command under the provisions of Annex 2, 2.3.1.*

15.2.3.3.1 If the aircraft is required to deviate from track to avoid adverse meteorological conditions and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received the pilot shall take the following actions:

a) if possible, deviate away from an organized track or route system;

b) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.5 MHz (or, as a back-up, on the inter-pilot air-to-air frequency 123.45 MHz);

c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

Note.— If, as a result of actions taken under the provisions of 15.2.3.3.1 b) and c) above, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

e) for deviations of less than 10 NM remain at a level assigned by ATC;

f) for deviations greater than 10 NM, when the aircraft is approximately 10 NM from track, initiate a level change in accordance with Table 15-1 shown below;

Route centre line track	***Deviations > 10 NM***	***Level change***
EAST $000^0 – 179^0$ magnetic	LEFT RIGHT	DESCEND 300 ft CLIMB 300 ft
WEST $180^o – 359^0$ magnetic	LEFT RIGHT	CLIMB 300 ft DESCEND 300 ft

Table 15-1: Level Change in case of Deviation > 10NM

g) when returning to track, be at its assigned flight level when the aircraft is within approximately 10 NM of the centre line; and

h) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

15.2.4 Strategic lateral offset procedures (SLOP)

15.2.4.1 ICAO separation minima, including lateral route spacing, are based on the assumption that aircraft operate on the centerline of a route. In general, unauthorized deviations from this requirement could compromise safety. However, the use of highly accurate navigation systems [such as Global Navigation Satellite System (GNSS)] reduces the magnitude of lateral deviations from the route center line and consequently increases the probability of a collision if a loss of vertical separation between aircraft on the same route occurs.

15.2.4.2 Strategic Lateral Offset Procedures (SLOP) are approved procedures that allow aircraft to fly on a parallel track to the right of the centre line relative to the direction of flight to mitigate the lateral overlap probability due to increased navigation accuracy and wake turbulence encounters.

15.2.4.3 By using offsets to provide lateral spacing between aircraft, the effect of reduction in the magnitude of random lateral deviations (due to the increased capability of flights to adhere to the center line of ATS Routes) can be mitigated, thereby reducing the risk of collision.

15.2.4.4 The Strategic Lateral Offset Procedures [SLOP] described below are applicable in Indian enroute oceanic airspace on route segments mentioned in AIP.

15.2.4.5 SLOP is applicable in Indian enroute oceanic airspace, subject to the following conditions:

i) The decision to apply a strategic lateral offset shall be the responsibility of the flight crew.

ii) The flight crew shall only apply strategic lateral offsets in airspace where such offsets have been authorized and when the aircraft is equipped with automatic offset tracking capability. Aircraft without automatic offset tracking capability must fly the centre line of the ATS Route being flown.

iii) Strategic lateral offsets shall be applicable only in enroute airspace, along approved ATS route segments specified in AIP, as follows:

1) where the lateral separation minima or spacing between route centre lines is 23 NM or more, offsets to the right of the centre line relative to the direction of flight in tenths of a nautical mile up to a maximum of 2 NM; and

2) where the lateral separation minima or spacing between route centre lines is 6 NM or more and less than 23 NM, offsets to the right of the

centre line relative to the direction of flight in tenths of a nautical mile up to a maximum of 0.5 NM.

iv) The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, an offset to the right and within the limits specified in 15.2.4.5 (iii) may be used.

v) In airspace where the use of lateral offsets has been authorized, pilots are not required to inform ATC that a strategic lateral offset is being applied. However, aircraft transiting areas of surveillance coverage in airspace where offset tracking is permitted may initiate or continue an offset, only with the approval of the concerned ATS unit.

vi) ATC may require aircraft to cancel SLOP and return to the centre line of the route for application of lateral separation.

vii) Pilots may contact other aircraft on the inter-pilot air-to-air frequency 123.45 MHz to coordinate offsets.

viii) Flight crew of aircraft following SLOP shall be responsible to avoid Prohibited, Danger and Restricted areas and other Special Use Airspaces along the route being flown.

15.2.5 Special Procedures to mitigate Wake Turbulence Encounters and Distracting Aircraft System Alerts in the Oceanic Airspace of the Chennai, Kolkata and Mumbai FIR.

15.2.5.1 The following special procedures are applicable to mitigate wake turbulence or distracting aircraft system alerts [e.g., ACAS, Ground Proximity Warning System (GPWS)] in airspace where RVSM is applied.

NOTE: In the contingency circumstances below, ATC will not issue clearances for lateral offsets and will not normally respond to actions taken by the pilots.

a. An aircraft that encounters wake vortex turbulence or experiences distracting aircraft system alerts shall notify ATC and request a flight level, track or speed change to avoid the condition. However, in situations where such a change is not possible or practicable, the pilot may initiate the following temporary lateral offset procedure with the intention of returning to center line as soon as practicable.

b. the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air to air frequency; 123.45MHz, and

c. one (or both) aircraft may initiate lateral offset(s) not to exceed 2NM from the assigned track, provided that:

i) as soon as practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so (ATC will not normally respond); and;

ii) the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s) (ATC will not normally respond).

15.3 AIR-GROUND COMMUNICATIONS FAILURE

Note 1.— Procedures to be applied in relation to an aircraft experiencing air-ground communication failure when providing ATS surveillance services are contained in chapter 8, Section 8.19.3.

Note 2.— An aircraft equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7600 to indicate that it has experienced air-ground communication failure. An aircraft equipped with other surveillance system transmitters, including ADS-B and ADS-C, might indicate the loss of air-ground communication by all of the available means.

Note 3.— Some aircraft equipped with first generation ADS-B avionics have the capability to transmit a general emergency alert only, regardless of the code selected by the pilot.

Note 4.— See also Chapter 6, 6.3.2.5 concerning departure clearances containing no geographical or time limit for cleared level below the flight planned level and procedures to be applied in relation to an aircraft experiencing air ground communication failure under such circumstances.

Note 5. — See also Chapter 5, 5.5.2.5.2.2, *for additional requirements applying to communication failure during the application of the 50 NM longitudinal RNAV/RNP 10 separation minimum.*

15.3.1 Action by air traffic control units when unable to maintain two-way communication with an aircraft operating in a control area or control zone shall be as outlined in the paragraphs which follow.

15.3.2 As soon as it is known that two-way communication has failed, action shall be taken to ascertain whether the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed by ATS surveillance system or to transmit, if possible, a specified signal in order to indicate acknowledgement.

Note.— Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

15.3.3 If the aircraft fails to indicate that it is able to receive and acknowledge transmissions, separation shall be maintained between the aircraft having the communication failure and other aircraft, based on the assumption that the aircraft will:

a) if in visual meteorological conditions:

i) continue to fly in visual meteorological conditions;

ii) land at the nearest suitable aerodrome; and

iii) report its arrival by the most expeditious means to the appropriate air traffic control unit; or

b) if in instrument meteorological conditions or when conditions are such that it does not appear likely that the pilot will complete the flight in accordance with a):

1) unless otherwise prescribed on the basis of a regional air navigation agreement, in airspace where procedural separation is being applied, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or,

2) in airspace where an ATS surveillance system is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following:

   i) the time the last assigned level or minimum flight altitude is reached; or

   ii) the time the transponder is set to Code 7600; or the ADS-B transmitter is set to indicate the loss of air-ground communications; or

   iii) the aircraft's failure to report its position over a compulsory reporting point;

   whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

3) when being vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;

4) proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with 5) below, hold over this aid or fix until commencement of descent;

5) commence descent from the navigation aid or fix specified in 4) at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and

acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;

6) complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and

7) land, if possible, within 30 minutes after the estimated time of arrival specified in 5) or the last acknowledged expected approach time, whichever is later.

Note 1.— Provisions related to minimum levels are contained in Annex 2, 5.1.2.

Note 2.— As evidenced by the meteorological conditions prescribed therein, 15.3.3. a) relates to all controlled flights, whereas 15.3.3. b) relates only to IFR flights.

Note 3:- See also 8.9.1.2 concerning the requirement for the flight crew to be informed of what a vector is to accomplish and the limit of the vector.

15.3.4 Action taken to ensure suitable separation shall cease to be based on the assumption stated in 15.3.3 when:

a) it is determined that the aircraft is following a procedure differing from that in 15.3.3; or

b) through the use of electronic or other aids, air traffic control units determine that action differing from that required by 15.3.3 may be taken without impairing safety; or

c) positive information is received that the aircraft has landed.

15.3.5 As soon as it is known that two-way communication has failed, appropriate information describing the action taken by the air traffic control unit, or instructions justified by any emergency situation, shall be transmitted blind for the attention of the aircraft concerned, on the frequencies available on which the aircraft is believed to be listening, including the voice frequencies of available radio navigation or approach aids. Information shall also be given concerning:

a) meteorological conditions favourable to a cloud-breaking procedure in areas where congested traffic may be avoided; and

b) meteorological conditions at suitable aerodromes.

15.3.6 Pertinent information shall be given to other aircraft in the vicinity of the presumed position of the aircraft experiencing the failure.

15.3.7 As soon as it is known that an aircraft which is operating in its area of responsibility is experiencing an apparent radio communication failure, an air traffic services unit shall forward information concerning the radio communication failure to all air traffic services units concerned along the route of flight. The ACC in whose area the destination aerodrome is located shall take steps to obtain information on the alternate aerodrome(s) and other relevant information specified in the filed flight plan, if such information is not available.

15.3.8 If circumstances indicate that a controlled flight experiencing a communication failure might proceed to (one of) the alternate aerodrome(s) specified in the filed flight plan, the air traffic control unit(s) serving the alternate aerodrome(s) and any other air traffic control units that might be affected by a possible diversion shall be informed of the circumstances of the failure and requested to attempt to establish communication with the aircraft at a time when the aircraft could possibly be within communication range. This shall apply particularly when, by agreement with the operator or a designated representative, a clearance has been transmitted blind to the aircraft concerned to proceed to an alternate aerodrome, or when meteorological conditions at the aerodrome of intended landing are such that a diversion to an alternate is considered likely.

15.3.9 When an air traffic control unit receives information that an aircraft, after experiencing a communication failure has re-established communication or has landed, that unit shall inform the air traffic services unit in whose area the aircraft was operating at the time the failure occurred, and other air traffic services units concerned along the route of flight, giving necessary information for the continuation of control if the aircraft is continuing in flight.

15.3.10 If the aircraft has not reported within thirty minutes after:

a) the estimated time of arrival furnished by the pilot;

b) the estimated time of arrival calculated by the ACC; or

c) the last acknowledged expected approach time,

whichever is latest, pertinent information concerning the aircraft shall be forwarded to aircraft operators, or their designated representatives, and pilots-in-command of any aircraft concerned and normal control resumed if they so desire. It is the responsibility of the aircraft operators, or their designated representatives, and pilots-in-command of aircraft to determine whether they will resume normal operations or take other action.

15 .4 ASSISTANCE TO VFR FLIGHTS

15.4.1 Strayed VFR flights and VFR flights encountering adverse meteorological conditions

Note.— A strayed aircraft is an aircraft which has deviated significantly from its intended track or which reports that it is lost.

15.4.1.1 A VFR flight reporting that it is uncertain of its position or lost, or encountering adverse meteorological conditions, should be considered to be in a state of emergency and handled as such. The controller shall, under such circumstances, communicate in a clear, concise and calm manner and care shall be taken, at this stage, not to question any fault or negligence that the pilot may have committed in the preparation or conduct of the flight. Depending on the circumstances, the pilot should be requested to provide any of the following information considered pertinent so as to better provide assistance:

a) aircraft flight conditions;

b) position (if known) and level;

c) airspeed and heading since last known position, if pertinent;

d) pilot experience;

e) navigation equipment carried and if any navigation aid signals are being received;

f) SSR Mode and code selected if relevant;

g) ADS-B capability;

h) departure and destination aerodromes;

i) number of persons on board;

j) endurance.

15.4.1.2 If communications with the aircraft are weak or distorted, it should be suggested that the aircraft climb to a higher level, provided meteorological conditions and other circumstances permit.

15.4.1.3 Navigation assistance to help the pilot determine the aircraft position may be provided by use of ATS surveillance system, direction-finder, navigation aids or sighting by another aircraft. Care must be taken when providing navigation assistance to ensure that the aircraft does not enter cloud.

Note.— The possibility of a VFR flight becoming strayed as a result of encountering adverse *meteorological conditions must be recognized.*

15.4.1.4 The pilot should be provided with reports and information on suitable aerodromes in the vicinity where visual meteorological conditions exist.

15.4.1.5 If reporting difficulty in maintaining or unable to maintain VMC, the pilot should be informed of the minimum flight altitude of the area where the aircraft is, or is believed to be. If the aircraft is below that level, and the position of the aircraft has been established with a sufficient degree of probability, a track or heading, or a climb, may be suggested to bring the aircraft to a safe level.

15.4.1.6 Assistance to a VFR flight should only be provided using an ATS surveillance system upon the request or concurrence of the pilot. The type of service to be provided should be agreed with the pilot.

15.4.1.7 When providing such assistance in adverse meteorological conditions, the primary objective should be to bring the aircraft into VMC as soon as possible. Caution must be exercised to prevent the aircraft from entering cloud.

15.4.1.8 Should circumstances be such that IMC cannot be avoided by the pilot, the following guidelines may be followed:

a) other traffic on the ATC frequency not able to provide any assistance may be instructed to change to another frequency to ensure uninterrupted communications with the aircraft; alternatively the aircraft being assisted may be instructed to change to another frequency;

b) ensure, if possible, that any turns by the aircraft are carried out clear of cloud;

c) instructions involving abrupt manoeuvres should be avoided; and

d) instructions or suggestions to reduce speed of the aircraft or to lower the landing gear, should, if possible, be carried out clear of cloud.

15.5 OTHER IN-FLIGHT CONTINGENCIES

15.5.1 Strayed or unidentified aircraft

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

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

<u>Unidentified aircraft.</u> 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.

15.5.1.1 As soon as an air traffic services unit becomes aware of a strayed aircraft, it shall take all necessary steps as outlined in 15.5.1.1.1 and 15.5.1.1.2 to assist the aircraft and to safeguard its flight.

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

15.5.1.1.1 If the aircraft's position is not known, the air traffic services unit shall:

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

b) use all available means to determine its position;

c) inform other ATS units into whose area the aircraft may have strayed or may stray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;

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

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

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

15.5.1.1.2 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.

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

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

b. inquire of other air traffic services units within the FIR 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 FIRs 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.

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

15.5.1.3 Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the appropriate authority designated by the State shall immediately be informed, in accordance with locally agreed procedures.

15.5.2 Interception of civil aircraft

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

a) attempt to establish two-way communication with the intercepted aircraft via any means available, including the emergency 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; and

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

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

a) inform the ATS unit serving the airspace in which the interception is taking place, providing this unit with available information that will assist in identifying the aircraft and requesting it to take action in accordance with 15.5.2.1;

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

15.5.3 Fuel dumping

15.5.3.1 *General*

15.5.3.1.1 An aircraft in an emergency or other urgent situation may need to dump fuel so as to reduce to maximum landing mass in order to effect a safe landing.

15.5.3.1.2 When an aircraft operating within controlled airspace needs to dump fuel, the flight crew shall advise ATC. The ATC unit should then coordinate with the flight crew the following:

a) the route to be flown, which, if possible, should be clear of cities and towns, preferably over water and away from areas where thunderstorms have been reported or are expected;

b) the level to be used, which should be not less than 6 000 ft; and

c) the duration of the fuel dumping.

15.5.3.2 *Separation*

15.5.3.2.1 Other known traffic should be separated from the aircraft dumping fuel by:

a) at least 10 NM horizontally, but not behind the aircraft dumping fuel;

b) vertical separation if behind the aircraft dumping fuel within 15 minutes flying time or a distance of 50 NM by;

i) at least 1000 ft if above the aircraft dumping fuel; and

ii) at least 3000 ft if below the aircraft dumping fuel.

Note.— The horizontal boundaries of the area within which other traffic requires appropriate vertical separation extend for 10 NM either side of the track flown by the aircraft which is dumping fuel, from 10 NM ahead, to 50 NM or 15 minutes along track behind it (including turns).

15.5.3.3 *Communications*

15.5.3.3.1 If the aircraft will maintain radio silence during the fuel dumping operation, the frequency to be monitored by the flight crew and the time when radio silence will terminate should be agreed.

15.5.3.4 *Information to other ATS units and non-controlled traffic*

15.5.3.4.1 A warning message shall be broadcast on appropriate frequencies for non-controlled traffic to remain clear of the area concerned. Adjacent ATC units and control sectors should be informed of the fuel dumping taking place and requested to broadcast on applicable frequencies an appropriate warning message for other traffic to remain clear of the area concerned.

Phraseology:

ATTENTION ALL AIRCRAFT, FUEL DUMPING IN PROGRESS IN THE VICINITY OF *(location)* AT *(level)* BY *(type of aircraft) (flight direction)*

15.5.3.4.2 Upon completion of the fuel dumping, adjacent ATC units and control sectors should be advised that normal operations can be resumed. A terminating message should be broadcasted on appropriate frequencies when the fuel dumping operation is completed.

Phraseology:

ATTENTION ALL AIRCRAFT, FUEL DUMPING IN THE VICINITY OF *(location)* TERMINATED.

15.5.4 Fuel emergency and minimum fuel

Note 1: General procedures to be applied when a pilot reports an emergencey *situation are contained in 15.1.1 and 15.1.2 of Chapter 15 of this Manual.*

Note 2: Coordination procedures to be applied between transferring and accepting ATS units for flights in fuel emergency or minimum fuel situations are contained in 10.2.5 of Chapter 10 of this manual.

Note 3: The words "MAYDAY FUEL" describe the ***nature of the distress condition*** *element in radiotelephony distress message to be sent by an aircraft in distress. (refer ICAO Annex 10 Vol II Chapter 5, 5.3.2.1 b) 3.).*

15.5.4.1 When a pilot reports a state of minimum fuel, the controller shall inform the pilot as soon as practicable of any anticipated delay or that no delay are expected.

Note: The declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing, and any change to the existing clearance may result in landing with less than planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

15.6 ATC CONTINGENCIES

15.6.1 The various circumstances surrounding each contingency situation preclude the establishment of exact detailed procedures to be followed. The procedures outlined below are intended as a general guide to air traffic services personnel.

15.6.1.1 Radio communications contingencies

15.6.1.1 General

15.6.1.1.1 ATC contingencies related to communications, i.e. circumstances preventing a controller from communicating with aircraft under control, may be caused by either a failure of ground radio equipment, a failure of airborne equipment, or by the control frequency being inadvertently blocked by an aircraft transmitter. The duration of such events may be for prolonged periods and appropriate action to ensure that the safety of aircraft is not affected should therefore be taken immediately.

15.6.1.2 Ground radio failure

15.6.1.2.1 In the event of complete failure of the ground radio equipment used for ATC, the controller shall:

a) where aircraft are required to keep a listening watch on the emergency frequency 121.5 MHz, attempt to establish radio communications on that frequency;

b) without delay inform all adjacent control positions or ATC units, as applicable, of the failure;

c) appraise such positions or units of the current traffic situation;

d) if practicable, request their assistance, in respect of aircraft which may establish communications with those positions or units, in establishing separation between and maintaining control of such aircraft; and

e) instruct adjacent control positions or ATC units to hold or reroute all controlled flights outside the area of responsibility of the position or ATC unit that has experienced the failure until such time that the provision of normal services can be resumed.

15.6.1.2.2 In order to reduce the impact of complete ground radio equipment failure on the safety of air traffic, contingency procedures to be followed by control positions and ATC units in the event of such failures should be established in MATS- Part 2. Where feasible and practicable, such contingency procedures should provide for the delegation of control to an adjacent control position or ATC unit in order to permit a minimum level of services to be provided as soon as possible, following the ground radio failure and until normal operations can be resumed.

15.6.1.3 *Blocked Frequency*

15.6.1.3.1 *Blocked & Simultaneous transmission*

15.6.1.3.1.1 Causes of blocked frequency

15.6.1.3.1.1.1 The operation of large numbers of aircraft in the same airspace increases the likelihood of simultaneous transmission, especially when the volume of traffic approaches the maximum handling capacity of the controller.

15.6.1.3.1.1.2 Where an RTF frequency is congested, pilots feel obliged to transmit as soon as they believe a previous transmission is complete in order to get their message across. This often leads to simultaneous transmissions.

15.6.1.3.1.1.3 Best Signal Selection (BSS) is sometimes employed to prevent two simultaneous transmissions from aircraft corrupting each other so that neither is intelligible. BSS compares the strength of simultaneous transmissions and automatically suppresses the

weaker one. Because the controller does not hear the weaker transmission it is likely that

the simultaneous transmission will go undetected.

15.6.1.3.1.1.4 Where similar call signs are in use, there is an increased probability of the wrong aircraft taking a clearance, especially if the call sign is blocked or garbled. Similarly, a controller may not detect a read-back error if the transmission is partially blocked. The use of similar call signs greatly increases the probability that a call taken by the wrong aircraft will go undetected.

15.6.1.3.1.1.5 Blocked transmissions may also result if the push-to-talk switch is not immediately released after a communication.

15.6.1.3.1.1.6 An excessive pause in a message (i.e. holding the push-to-talk switch while preparing the next item of the transmission) may lead others to believe that the transmission is complete, which may result in the response or part of another message being blocked.

15.6.1.3.1.1.7 The absence of a read-back from the pilot should be treated as a blocked transmission with prompt request to repeat or confirm the message.

15.6.1.3.1.1.8 In practice, most pilots are unlikely to treat the absence of a hear back acknowledgement from the controller as evidence of a blocked transmission, and only question the controller if they are uncertain that the read-back was correct or have other reasons to suspect a blocked transmission.

15.6.1.3.2 In the event that the control frequency is inadvertently blocked by an aircraft transmitter, the following additional steps should be taken:

a) attempt to identify the aircraft concerned;

b) if the aircraft blocking the frequency is identified, attempts should be made to establish communication with that aircraft, e.g. on the emergency frequency 121.5 MHz, by SELCAL, through the aircraft operator's company frequency if applicable, on any VHF frequency designated for air-to-air use by flight crews or any other communication means or, if the aircraft is on the ground, by direct contact;

c) if communication is established with the aircraft concerned, the flight crew shall be instructed to take immediate action to stop inadvertent transmissions on the affected control frequency.

15.6.1.3.3 **Precautions to be taken by the Air traffic controllers for blocked and simultaneous transmission:**

a) Ensure that they are familiar with the characteristics and limitations of the RTF equipment they operate. In particular, they should have detailed information on RTF Best Signal Selection (BSS) functionality if used, including the process itself, how it should be used and the problems inherent in the system.

b) Use correct RTF phraseology, procedures and discipline at all times.

c) Not to clip transmissions.

d) Ensure clearances are read back correctly, besides not using read-back time to execute other tasks.

e) Monitor flight crew compliance with RTF call sign in use.

f) Take extra care when language difficulties may exist.

g) If a blocked transmission is suspected, ensure that both aircraft retransmit their messages and confirm carefully that a clearance has not been taken by an aircraft for which it was not intended.

h) Where a blocked or simultaneous transmission is observed, file a report as per incident reporting system provided in 3.19 of this document on Air Traffic Incidents Report of an incident.

15.6.1.3.4 When combining or bifurcating sectors, the frequency plan should be communicated to the adjacent centres/positions and the closed frequencies should be monitored for the transitional period;

15.6.1.3.5 Although not an official procedure, some pilots make a practice of alerting controllers and other pilots to an apparent blocked or garbled transmission by saying “Blocked” immediately afterwards. This practice should be encouraged.15.6.1.4

15.6.1.4 *Unauthorized use of ATC frequency*

15.6.1.4.1 Instances of false and deceptive transmissions on ATC frequencies which may impair the safety of aircraft can occasionally occur. In the event of such occurrences, the ATC unit concerned should:

a) correct any false or deceptive instructions or clearances which have been transmitted;

b) advise all aircraft on the affected frequency(-ies) that false and deceptive instructions or clearances are being transmitted;

c) instruct all aircraft on the affected frequency(-ies) to verify instructions and clearances before taking action to comply;

d) if practical, instruct aircraft to change to another frequency; and

e) if possible, advise all aircraft affected when the false and deceptive instructions or clearances are no longer being transmitted.

15.6.1.4.2 Flights crews shall challenge or verify with the ATC unit concerned any instruction or clearance issued to them which they suspect may be false or deceptive.

15.6.1.4.3 When the transmission of false or deceptive instructions and clearances is detected, the appropriate authority shall take all necessary action to have the transmitter located and the transmission terminated.

15.7 OTHER ATC CONTINGENCY PROCEDURES

15.7.1 Emergency separation

15.7.1.1 If, during an emergency situation, it is not possible to ensure that the applicable horizontal separation can be maintained, emergency separation of half the applicable vertical separation minimum may be used, i.e. 500 ft between aircraft in airspace where a vertical separation minimum of 1 000 ft is applied, and 1 000 ft between aircraft in airspace where a 2000 ft vertical separation minimum is applied.

15.7.1.2 When emergency separation is applied the flight crews concerned shall be advised that emergency separation is being applied and informed of the actual minimum used. Additionally, all flight crews concerned shall be provided with essential traffic information.

15.7.2 Short-term conflict alert (STCA) procedures

Note 1.— The generation of short term conflict alerts is a function based on surveillance data, integrated into an ATC system. The objective of the STCA function is to assist the controller in preventing collision between aircraft by generating, in a timely manner, an alert of a potential or actual infringement of separation minima.

Note 2. — In the STCA function the current and predicted three-dimensional positions of aircraft with pressure altitude reporting capability are monitored for proximity. If the distance between the three-dimensional positions of two aircraft is predicted to be reduced to less than the defined applicable separation minima within a specified time period, an acoustic and/ or visual alert will be generated to the controller within whose jurisdiction area the aircraft is operating.

15.7.2.1 Local instructions concerning use of the STCA function shall be contained in MATS 2 and specify, *inter alia*:

a) the types of flight which are eligible for generation of STCA;

b) the sectors or areas of airspace within which the STCA function is implemented;

c) the method of displaying the STCA to the controller;

d) the parameters for generation of alerts as well as alert warning time;

e) conditions under which the STCA function may be inhibited for individual aircraft tracks; and

f) procedures applicable in respect of flights for which STCA has been inhibited.

15.7.2.2 In the event an STCA is generated in respect of controlled flights, the controller shall without delay take action to ensure that the applicable separation minimum will not be infringed.

15.7.2.3 Following the generation of an STCA, controllers should be required to complete an air traffic incident report only in the event that a separation minimum was infringed.

15.7.2.4 The Circumstances pertaining to generation of each STCA should be analysed by ATS Incharge to determine whether an alert was justified or not. Non-justified alerts, e.g. when visual separation was applied, should be ignored. A statistical analysis should be made of justified alerts in order to identify possible shortcomings in airspace design and ATC procedures as well as to monitor overall safety levels.

15.7.3 Procedures in regard to aircraft equipped with airborne collision avoidance systems (ACAS)

15.7.3.1 The procedures to be applied for the provision of air traffic services to aircraft equipped with ACAS shall be identical to those applicable to non-ACAS equipped aircraft. In particular, the prevention of collisions, the establishment of appropriate separation and the information which might be provided in relation to conflicting traffic and to possible avoiding action shall conform with the normal ATS procedures and shall exclude consideration of aircraft capabilities dependent on ACAS equipment.

15.7.3.2 When a pilot reports an ACAS resolution advisory (RA), the controller shall not attempt to modify the aircraft flight path until the pilot reports "Clear of Conflict".

15.7.3.3 Once an aircraft departs from its ATC clearance or instruction in compliance with an RA, or a pilot reports an RA, the controller ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the manoeuvre induced by the RA. The controller shall resume responsibility for providing separation for all the affected aircraft when:

a) the controller acknowledges a report from the flight crew that the aircraft has resumed the current clearance; or

b) the controller acknowledges a report from the flight crew that the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew.

Note.— Pilots are required to report RAs which require a deviation from the current ATC clearance or instruction (see PANS-OPS*, Volume I, Part III, Section 3, Chapter 3, 3.2 c) 4)). This report informs the controller that a deviation from clearance or instruction is taking place in response to an ACAS RA.*

15.7.3.4 Operators should specify procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 1500 ft/min throughout the last 1000 ft of climb or descent to the assigned level. These procedures are intended to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at adjacent levels. *(Ref: DGCA Ops circular 7/2010)*

15.7.3.5 *Procedure for reporting RA's:*

a) Reports made by aircraft on RA shall be entered in the log book and WSO and ATS Incharge of the station shall be informed.

b) Reports of RA shall be reported by signal to M (ANS) / ED (ATM) / GM (SQMS).

c) Local Incharge of ATS units shall investigate the incident and take further action in consultation with GM(SQMS).

d) Following a significant ACAS event, controllers should complete an Air Traffic Incident Report.

Note 1.— The ACAS capability of an aircraft may not be known to air traffic controllers.

Note 2.— The phraseology to be used by controllers and pilots is contained in Chapter 12, 12.16.1.2 r) to 12.16.1.2. y) of this Manual.

15.7.4 Minimum safe altitude warning (MSAW) procedures

Note 1:- The generation of minimum safe altitude warnings is a function of an ATC radar data-processing system. The objective of the MSAW function is to assist in the prevention of controlled flight into terrain accidents by generating, in a timely manner, a warning of the possible infringement of a minimum safe altitude

Note 2:- In the MSAW function, the reported levels from aircraft with pressure-altitude reporting capability are monitored against defined minimum safe altitudes. When the level of an aircraft is detected or predicted to be less than the applicable minimum safe altitude, an acoustic and visual warning will be generated to the controller within whose jurisdiction area the aircraft is operating.

15.7.4.1 Local instructions concerning use of the MSAW function shall be contained in MATS- Part 2 and specify, *inter alia*:

a) the types of flight which are eligible for generation of MSAW;

b) the sectors or areas of airspace for which MSAW minimum safe altitudes have been defined and within which the MSAW function is implemented;

c) the values of the defined MSAW minimum safe altitudes;

d) the method of displaying the MSAW to the controller;

e) the parameters for generation of MSAW as well as warning time; and

f) conditions under which the MSAW function may be inhibited for individual aircraft tracks as well as procedures applicable in respect of flights for which MSAW has been inhibited.

15.7.4.2 In the event an MSAW is generated in respect of a controlled flight, the following action shall be taken without delay:

a) if the aircraft is being vectored, the aircraft shall be instructed to climb immediately to the applicable safe level and, if necessary to avoid terrain, be assigned a new heading;

b) in other cases, the flight crew shall immediately be advised that a minimum safe altitude warning has been generated and be instructed to check the level of the aircraft.

Phraseology:

a) *Low Altitude warning*:

(aircraft call sign) LOW ALTITUDE WARNING, CHECK YOUR ALTITUDE IMMEDIATELY, QNH IS *(number)* *[(units)]*. [THE MINIMUM FLIGHT ALTITUDE IS *(altitude)*].

b) Terrain Alert:

(aircraft call sign) TERRAIN ALERT, *(suggested pilot action, if possible)*.

15.7.4.3 Following an MSAW event, controllers should complete an air traffic incident report only in the event that a minimum safe altitude was unintentionally infringed with a potential for controlled flight into terrain by the aircraft concerned.

15.7.5 Ground Proximity Warning System

15.7.5.1 A controller is not to dissuade a pilot from climbing his aircraft upon receipt of a ground proximity warning. The message should be acknowledged and if appropriate QNH setting should be passed for confirmation.

15.7.6 Call Sign Confusion

15.7.6.1 The use of similar call signs by aircraft operating in the same area on the same RTF frequency often gives rise to potential and actual flight safety incidents. This hazard is usually referred to as "call sign confusion". Such call sign confusions often lead to incidents such as Airprox, loss of separation, loss of communication, blockage of transmissions, level bust, runway incursions, Controlled Flight Into terrain (CFIT), increased workload for both pilots and controllers etc.

15.7.6.1.1 *Causes of Call Sign Confusions:* Some of the reasons of RTF call sign confusion are:

a) Different airlines operate services with the same flight number at the same time e.g. ABC407, PQR407;

b) Within a short span of time, an airline operates a number of services with near sequential or similar flight numbers (more than 50% of same digits) e.g.

- 3 numbers common (ABC3516 & ABC3546) or (ABC3254 & ABC254)
- 2 numbers common (ABC348 & ABC344)
- same numbers in different order (ABC3524 & ABC3254) or (ABC154 & ABC145)
- 3 similar numbers with same letter as a suffix (ABC345A &

ABC354A)

c) Within a short span of time, a company operates an extra or delayed service with a flight number very similar to the normal service's flight number e.g.

- ABC2714 &ABC2714
- ABC2714 & ABC2714A
- ABC2714 & ABC2714D

d) Within a short span of time two aircraft using similar registration marking as call signs e.g.

- VT-ABC & VU-ABC
- VT-ABC & VT-ADC

15.7.6.1.2 *Consequence of Call Sign Confusion:* During the condition of call sign confusion, an aircraft receives and acts on a clearance intended for another aircraft, consequences of which are:

- the aircraft takes up a heading or routing intended for another aircraft;
- the aircraft commences a climb or descent to a level to which it has not been cleared;
- the aircraft leaves the appropriate RTF frequency;
- in responding to a message, the aircraft blocks a transmission from the intended recipient;
- the intended recipient does not receive the clearance, and fails to take up the desired heading or routing, or fails to climb or descent to the cleared level;
- the controller misunderstands the intentions of aircraft under his/her control;
- the controller issues a clearance to the wrong aircraft, and/or fails to issue a clearance to the intended aircraft;
- the workload of controllers and pilots is increased because of the necessity to resolve the confusion.

Note: Following are some of the radio disciplines which will help in minimising risk of call sign confusion and also increase the possibility of detection of such call sign confusions:

- *Observe correct RTF discipline at all times.*
- *Pronounce call signs at a lower speed and more clearly when aircraft*

have similar call signs.

- *Do not clip transmissions.*
- *Do not use readback time to execute other tasks. Ensure clearances are readback correctly. Correct any error in read-back and insist on further read-back until it is certain that the clearance has been correctly copied.*
- *Exercise particular caution when language difficulties may exist.*
- *Always use headsets especially during periods of high workload and/or R TF load and actively monitor flight crew transmissions and their compliance with RTF call sign use.*
- *If a blocked transmission is suspected, ensure that both aircraft retransmit their messages and confirm carefully that a clearance has been taken by an aircraft for which it was intended.*

15.7.6.2 Change of radiotelephony call sign for aircraft in the likelihood of call sign confusion;

15.7.6.2.1 An ATC unit may instruct an aircraft to change its type of RTF call sign, in the interests of safety, when similarities between two or more aircraft RTF call signs are such that confusion is likely to occur.

Phraseology: CHANGE YOUR CALL SIGN TO (*new call sign*) [UNTIL FURTHER ADVISED]

15.7.6.2.2 Any such change to the type of call sign shall be temporary and shall be applicable only within the airspace(s) where the confusion is likely to occur.

15.7.6.2.3 To avoid confusion, the ATC unit should, if appropriate, identify the aircraft which will be instructed to change its call sign by referring to its position and/or level.

15.7.6.2.4 When an ATC unit changes the type of call sign of an aircraft, that unit shall ensure that the aircraft reverts to the call sign indicated by the flight plan when the aircraft is transferred to another ATC unit, except when the call sign change has been coordinated between the two ATC units concerned.

15.7.6.2.5 The appropriate ATC unit shall advise the aircraft concerned when it is to revert to the call sign indicated by the flight-plan.

Phraseology: REVERT TO FLIGHT PLAN CALL SIGN (*call sign*) [AT (*significant point*)]

15.7.6.3 **Reporting Call Sign Confusion**:

15.7.6.3.1 Procedures for reporting of incidents due to call sign confusion is same as enumerated in 3.19 of this documnet on "Reporting & Investigation of Air Traffic

Incidents Report of an incident.

15.7.6.3.2 When an ATCO finds similar call signs which may lead to call sign confusions, she/he should email following information to report_callsignconfusion@aai.aero for analysis and taking up issue with Appropriate Authorities for suitable action:

a) Date and Time

b) Sector or geographical location

c) Call signs of the aircraft concerned

d) Phase of the flight

15.8 PROCEDURES FOR ATS UNITS WHEN A VOLCANIC ASH CLOUD IS REPORTED OR FORECAST

15.8.1 If a volcanic ash cloud is reported or forecast in the airspace for which the ATS unit is responsible, the following actions should be taken:

a) relay pertinent information immediately to flight crews whose aircraft could be affected to ensure that they are aware of the ash cloud's current and forecast position and the flight levels affected;

b) accommodate requests for re-routing or level changes to the extent practicable;

c) suggest appropriate re-routing to avoid or exit areas of reported or forecast ash clouds when requested by the pilot or deemed necessary by the controller; and

d) when practicable, request a special air-report when the route of flight takes the aircraft into or near the forecast ash cloud and provide such special air-report to the appropriate agencies.

Note 1.— Experience has shown that the recommended escape manoeuvre for an aircraft which has encountered an ash cloud is to reverse its course and begin a descent if terrain permits. The final responsibility for this decision, however, rests with the pilot-in-command as specified in the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical clouds (DOC 9691), 5.2.4.1.

Note 2.— The final authority as to the disposition of the aircraft, whether to avoid or proceed through a reported or

forecast ash cloud, rests with the pilot-in-command, as prescribed in Annex 2, 2.4.

15.8.2 When the flight crew advises the ATS unit that the aircraft has inadvertently entered a volcanic ash cloud, the ATS unit should:

a) take such action applicable to an aircraft in an emergency situation; and

b) initiate modifications of route or level assigned only when requested by the pilot or necessitated by airspace requirements or traffic conditions.

CHAPTER 16

MISCELLANEOUS PROCEDURES

16.1 RESPONSIBILITY IN REGARD TO MILITARY TRAFFIC

16.1.1 It is recognized that some military aeronautical operations necessitate non-compliance with certain air traffic procedures. In order to ensure the safety of flight operations the appropriate military authorities shall be asked, whenever practicable, to notify the proper air traffic control unit prior to undertaking such manoeuvres.

16.1.2 A reduction of separation minima required by military necessity or other extraordinary circumstances shall only be accepted by an air traffic control unit when a specific request in some recorded form has been obtained from the authority having jurisdiction over the aircraft concerned and the lower minima then to be observed shall apply only between those aircraft. Some recorded form of instruction fully covering this reduction of separation minima must be issued by the air traffic control unit concerned.

16.2 RESPONSIBILITY IN REGARD TO UNMANNED FREE BALLOONS

16.2.1 On receipt of notification of the intended flight of a medium or heavy unmanned free balloon, the air traffic services unit shall arrange for the information to be disseminated to all concerned. The information shall include:

a) the balloon flight identification or project code name;

b) balloon classification and description;

c) SSR Code or NDB frequency as applicable;

d) the launch site;

e) the estimated time of the commencement of the launch or the planned period of the launches;

f) the expected direction of ascent;

g) the cruising level(s) (pressure-altitude); and

h) the estimated elapsed time to pass 60 000 ft pressure-altitude, or to reach cruising level if at or below 46 000 ft, together with the estimated location.

16.2.2 On receipt of notification that a medium or heavy unmanned free balloon has been launched, the air traffic services unit shall arrange for the information to be disseminated to all concerned. The information shall include:

a) the balloon flight identification or project code name;

b) balloon classification and description;

c) SSR Code or NDB frequency as applicable;

d) the launch site;

e) the time of launch(es);

f) the estimated time at which 46000 ft pressure-altitude will be passed, or the estimated time at which the cruising level will be reached if at or below 46000 ft, and the estimated location;

g) the estimated date and time of termination of the flight; and

h) the planned location of ground contact, when applicable.

16.2.3 When there is reasonable expectation that a heavy or medium unmanned free balloon will cross international borders, the appropriate ATS unit shall arrange for the pre launch and the launch notifications to be sent by NOTAM to the ATS unit(s) in the State(s) concerned.

16.2.4 Air traffic services units shall maintain radar and/or ADS-B surveillance of medium and heavy unmanned free balloons to the extent possible and, if necessary and on the request of the pilot of an aircraft, provide separation using an ATS surveillance system between the aircraft and such balloons which are identified or their exact position is known.

16.3 RUNWAY INCURSION

16.3.1 ***Runway incursion:*** Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

Note: Runway incursion is a complex problem which takes place in a complex and dynamic environment where root causes are difficult to isolate. Generally runway incursions occur because people make mistakes. These mistakes can be corrected if procedures are adhered to.

16.3.2 Following actions are required to be taken to reduce runway incursions:

a) Aerodrome Controller shall maintain a continuous watch on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel in the manoeuvring area.

b) Taxi clearance shall contain concise instructions and adequate information so as to assist the flight crew to follow the correct taxi routes to avoid collision with other aircraft or objects and to minimize the potential for the aircraft inadvertently entering active runway.

c) When a taxi clearance contains a taxi limit beyond a runway, it shall contain and explicit clearance to cross or an instruction to hold short of the runway.

d) The SMC Controller should not give any clearance to aircraft beyond the designated holding position of an active runway.

e) If the control tower is unable to determine either visually or by radar, that a vacating or crossing aircraft has cleared the runway, the aircraft shall be requested to report when it has vacated the runway.

f) The Aerodrome Controller shall always use the call sign of the aircraft or vehicle before passing any clearance or instruction.

g) The Aerodrome Controller shall ensure read back of clearance and instructions to enter, hold short of, cross taxi and back track on any runway.

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

i) Transfer of communication shall be segregated from the instructions to enter, hold short of, cross taxi and back track on any runway.

j) The Aerodrome Controller shall use standard RTF phraseologies for issuance clearances and instructions.

k) When pilot is known to be unfamiliar with the topography of the airport or in poor visibility conditions, the taxi instructions should be passed slowly in progressive manner.

l) The Aerodrome Controllers shall update themselves with NOTAMS for information on runway and taxiway closures, construction work in operational area and lightings.

m) SMC Controller and Tower Controller shall have close coordination with each other. The SMC Controller should release the aircraft to the Tower Controller at or before the holding position when crossing of active runway is involved. SMC Controller shall take prior clearance from the Tower Controller before permitting any vehicle or person on the active runway. Similarly the Tower Controller shall take prior clearance from the SMC Controller before permitting any landing / take off on the runway which is not in use.

n) If any runway incursion occurs, the incident reporting procedures enumerated in para 3.18 of chapter 3 shall be followed.:

16.4 PROCEDURE FOR HANDLING OF ONLINE FPLS

16.4.1 General

16.4.1.1 An online FPL portal www.onlinefpl.in is available where Pilot-in-Command or an authorized flight dispatcher can register and open an account for filing FPL online. The online FPL not only automates the process of filing FPL but also saves valuable time and is eco-friendly too. It also ensures that the FPL is in correct format and PIC or authorized flight dispatchers also receive an automated acknowledgement of filing the flight plan online.

16.4.1.2 The FPL filed online gets automatically addressed and transmitted through AFTN, thereby reducing the workload of CNS/ATM executives and timely distribution of FPL is ensured.

16.4.1.3 This facility is available to Domestic Operators, General Aviation and Indian Military Authorities for flights operating within India.

16.4.2. Procedure for filing the flight plan using online FPL portal

16.4.2.1 General information

16.4.2.1.1 The flight plan portal can be accessed using internet on URL:- http://onlinefpl.in

16.4.2.1.2 Online registration is prerequisite for the use of the services.

16.4.2.1.3 Once access is granted, the flight plan can be filed for any domestic airport using online FPL portal.

16.4.2.1.4 All activities on servers are monitored by Onlinefpl webmaster.

16.4.2.1.5 Obtaining the FIC and ADC numbers, Meteorological and Communication briefings and the ATC clearances remains the responsibility of the operator.

16.4.2.1.6 The flight planning activity for system purpose is divided into 22 nodal stations.

16.4.2.1.7 The steps involved in FPL filing on the Online Flight Plan portal are as follows:

1. Select the FIR of the intended place of departure.
2. Look for the nodal stations in that FIR.
3. Select the location indicator of place of departure within that nodal station.

4. If it is uncontrolled place of departure, input "zzzz" and system will prompt nearest airport where ICAO location indicator is available. By doing so, the system will understand the place of departure. Mention the details about place of departure in field 18.
5. In case of destination of zzzz, the system will again ask for nearest aerodrome. In this case repeat step 4.

16.4.2.1.8 System is capable of providing the required help online for filing the flight plan.

16.4.2.1.9 For redundancy purpose, two e-mail ids are created for ARO at each station.

16.4.2.1.10 vxxx.aro@aai.aero and vxxxaro@onlinefpl.in are the mail ids created for each nodal station (VXXX is the location indicator of the respective airport).

16.4.2.1.11 Configure these e-mail ids in the MS Outlook or Mozilla Thunderbird. Detailed procedure for configuration is available on www.aaians.org (under onlinefpl tab). Outlook configuration procedure needs to be followed as per the guidelines from IT section. Ensure that the mailbox is not full.

16.4.2.1.12 In case of failure of the intranet, these e-mail ids can be accessed as webmail on internet.

16.4.2.2 Process of registration for onlinefpl.in

16.4.2.2.1 PIC or the authorized flight dispatchers need to register and open an account at AAI onlinefpl portal www.onlinefpl.in.

16.4.2.2.2 Onlinefpl.in webmaster will activate the account after scrutinizing the supplied documents.

16.4.2.2.3 Once the account is activated, the PIC or the authorized flight dispatcher can file the FPL online.

16.4.2.2.4 Activation of account is a one-time process.

16.4.2.2.5 Any misuse of this facility by users may lead to suspension of the membership and ARO should bring such cases to the notice of Onlinefpl team.

16.4.2.3 Action by ARO

16.4.2.3.1 Once, flight plan is filed using onlinefpl portal, the information on filing of the plan will be sent to the concerned user/ Nodal ARO and the AFTN client (the software which changes email to AFTN format) by the portal automatically (refer Table 16-1).

16.4.2.3.2 AFTN client will process each FPL, filed online, and convert it into AFTN format and transmit it to AMSS.

16.4.2.3.3 Once Flight plan is transmitted, auto generated mail will be sent to the concerned user and Nodal ARO stating that said Flight plan is received and transmitted to AMSS.

16.4.2.3.4 ARO needs to check his mailbox periodically and archive old messages to keep mailbox ready to receive next mail.

16.4.2.3.5 ARO needs to act if he doesn't receive the confirmatory mail of AMSS transmission and call from user as explained in 16.4.2.3.2 and 16.4.2.3.3.

16.4.2.3.6 Once, PIC or authorized flight dispatcher enquires about filed FPL for which acknowledgment of transmission is not received, ARO should check the availability of FPL in his mailbox for vxxx.aro@aai.aero or alternate mail-id VXXXaro@onlinefpl.in using webmail of www.onlinefpl.in. (VXXX is the location indicator of respective Airport).

16.4.2.3.7 As flight plan gets directly transmitted from client, it may so happen that ARO may not have e-mail but flight plan is available in the system (in case, local intranet/internet not available). In such cases, ARO may see FDPS and check the availability of filed FPL.

16.4.2.3.8 If server is down, users will not be able to file the flight plan using online FPL portal.

16.4.2.3.9 If server is functioning and ATFN client is down then follow 16.4.2.3.6.

16.4.2.3.10 Online FPL team will get alert from server and they will rectify the problem immediately.

16.4.2.3.11 All activities can be performed using intranet.

16.4.2.3.12 One can get connected to AAI network using VPN connection or internet broadband. Hence, ATS in charge is advised to arrange broadband connection for redundancy.

16.5 OPERATION OF NON-SCHEDULE FLIGHTS

16.5.1 General

16.5.1.1 Foreign non-schedule flights are of two types – Civil & Military.

16.5.1.1.1 <u>Civil Flights</u>

16.5.1.1.1.1 Civil foreign non-schedule flights intending to operate non-scheduled flights into, from or over Indian territory including Indian territorial waters need Authorization from DGCA, India (YA)

FIR	Place of intended departure	ARO to whom online FPL is sent by System
MUMBAI	VABB,VADN,VAPO,VAAU,VAKP,VANR,VAJL,VAOZ,VARG (AREA WITHIN MUMBAI CTR/CTA)	MUMBAI
	VAAH,VABO,VAMA,VAUD,VARK,VAPR,VAKE,VASU, VADU,VAJM,VAKS,VABJ,ZZZZ (AREA WITHIN VAAH CTR/CTA), AREA OF INDORE WHEN IT IS OFF WATCH	AHMEDABAD
	VAGD, VANP, VAAK, VAJB,ZZZZ (AREA WITHIN NAGPUR CONTROL ZONE/AREA, AREA OF BHOPAL WHEN IT IS OFF WATCH	NAGPUR
	VABP,VIGR,VAKJ,ZZZZ (AREA WITHIN VABP	BHOPAL
	VAID, ZZZZ (AREA WITHIN VAID ZONE/AREA),	INDORE
	VAJJ	VAJJ
DELHI	VIDP,VIDD,VIHR,VIGG,VISM,VIBR,VIXD,VIDN,VIPN,ZZZZ (AREA WITHIN DELHI ZONE/AREA), AREA OF JAIPUR/AMRITSAR WHEN IT IS OFF WATCH	DELHI
	VIBN,VIKA,VIJN,VIAL,VIBY,VIRB,ZZZZ (AREA WITHIN VIBN	VARANASI
	VIJP,VIAG,VIJO,VIJR, ZZZZ (AREA WITHIN JP CTR/CTA)	JAIPUR
	VILK,VIBL,VISP,ZZZZ (AREA WITHIN VILK CTR/CTA)	LUCKNOW
	VIAR,VIBT,VILD,VIPK,VIPL, ZZZZ (AREA WITHIN VIAR CTR/CTA)	AMRITSAR
KOLKATA	VECC,VEMH,VEPH, ZZZZ (AREA WITHIN VECC CTR/CTA/FIC)	KOLKATA
	VERC, VEGK,VEMZ,VEPT,VEPR,VERL,VECK,VEBK,VEBG,VEBA,VEJS, ZZZZ (AREA WITHIN VERC CTR/CTA)	RANCHI
	VEBS, VEHX,VEDX,VABI,VARP, ZZZZ (AREA WITHIN VEBS	BHUBANESHWAR
CHENNAI	VOMM, VOCP,VOVR, VOPC,VOPB,VOTP, VOSB,VOVZ, VOTX,VOTR, ZZZZ (AREA WITHIN VOMM CTR/CTA)	CHENNAI
	VOTV,VOSX,VOMD,VOTK,VOTJ,VORM,ZZZZ (PLACES WITHIN TV CTA/CTR)	TRIVANDRUM
	VOCL,ZZZZ (AREA WITHIN VOCL CTR/CTA)	CALICUT
	VOML,VOGO,VOBM, ZZZZ (AREA WITHIN VOML	MANAGALORE
	VOCI, VOCC, VOCB,VOAT, ZZZZ (AREA WITHIN VOCI CTR/CTA)	COCHIN

	VODK,VOHY,VOHS,VODG,VOBR,VOWA,VOHK,VORY,VOBZ, VORG,VOBR,VALT,VAND,VASL, ZZZZ (AREA WITHIN VOHS CTR/CTA)	**HYDERABAD**
	VOBL,VOBG,VOMY,VOYK,VOPN,VOHB,VOJK,VOBI,VOJV,ZZZZ (AREA WITHIN VOBL CTR/CTA)	**BANGALORE**
GUWAHATI	VEGT, ZZZZ (AREA WITHIN VEGT CTR/CTA)	**GUWAHATI**

Table 16-1: Place of departure and respective ARO for receipt of Flight Plan

16.5.1.1.1.2 No DGCA Authority (YA) is required for aircraft operating outside the Indian Territory which includes the territorial waters, within Indian Flight Information Regions.

16.5.1.1.1.3 Civil Foreign Non-scheduled flights intending to operate at Military airport need Air Hqrs. Clearance (AOR) in addition to DGCA India Authority (YA).

16.5.1.1.1.4 Delhi ARO is the Nodal Office for the DGCA authority.

16.5.1.1.1.5 Delhi ARO being the Nodal Office will maintain a record of all DGCA Authority (YA No.) for operation of non-scheduled flights.

16.5.1.1.1.6 Signal authorizing such non-scheduled flights is issued by the DGCA in every case addressed to Mumbai, Delhi, Kolkata, Chennai, Ahmedabad and Trivandrum. Such Authorisation Reference NO. (YA/N/-) is in a serial order.

16.5.1.1.1.7 On receipt of DGCA Authorization, (YA number) it should be checked that all YA numbers in serial order have been received and no YA number is missing. In case any YA number is missing, action will be taken to get the missing YA number.

16.5.1.1.1.8 DGCA Authority is valid for a period of 48 hours. If a flight gets delayed beyond 48 hours, it will require fresh clearance from the DGCA.

16.5.1.1.1.9 In the following cases fresh authorization (DGCA clearance) is required.

i) Change of call sign of aircraft.

ii) Change in place of departure or destination

iii) Change in type of aircraft.

16.5.1.1.1.10 ATS in charge should evolve a procedure for delivery of YA/AOR Authorities in respect of landing non-schedule flights to the Customs and Immigration Department on daily basis.

16.5.1.1.1.11 The pilots are required to quote Authorization Reference Number (YA Number and/or AOR number) in Field 18 of the Flight Plan.

16.5.1.1.1.12 Pilot-in-command is also required to carry Reference Number (YA Number and/or AOR No.) authorizing the flights with him and quote if and when required by the ATC Authority. Over flying aircrafts unable to quote the Authority are liable to make landing in India. Any aircraft after landing in India in accordance with above shall require specific permission of DGCA/AHQ for undertaking any further flight.

16.5.1.1.1.13 International flights into, from or over Indian Territory are required to follow the established international ATS routes as published in ENR 3 of AIP India as amended from time to time by NOTAMs/AIP Supplements. International flights may be permitted by ATC to operate to domestic ATS route provided established international ATS route is not available for any sector.

16.5.1.1.2 Military Aircraft

16.5.1.1.2.1 Air Headquarters Authority to operate is required in the following circumstances:

a) Foreign military aircraft over-flying India.

b) Foreign military aircraft landing at any Indian Airport whether Civil or Defence.

c) Foreign registered aircraft operating to any military airport in Indian

d) Indian registered aircraft operating to any military airport in India.

16.5.1.1.2.2 Authority from Naval Headquarters is required to operate to Naval Air Fields.

16.5.1.1.2.3 The validity of AOR Authority for operating to airports owned by Indian Navy/Air Force is given as under:

a) Indian Non-Scheduled Flights: Clearance valid within plus three hours of estimated schedule subject to ATC watch hours.

b) Foreign non-scheduled flights: Clearance valid within plus/minus one hour of estimated schedule for three days (72 hours).

16.5.1.1.2.4 Notwithstanding the standard validity of various authorizations indicated above, the period of validity, if given in the AOR Authority shall be treated as final.

16.5.1.2 Operating Procedures

16.5.1.2.1 Arrival

16.5.1.2.1.1 On receipt of flight plan, check that valid DGCA Authority YA or/an AOR number is available with the ATS Unit.

16.5.1.2.1.2 If valid Authority is available, obtain ADC number and permit the flight to operate as per terms and conditions of the Authority.

16.5.1.2.1.3 In case valid Authority is not available, flight shall not be permitted to enter into Indian airspace. The adjacent FIR shall be informed in clear and concise manner that he flight is not (Repeat Not) permitted to enter into Indian airspace.

16.5.1.2.1.4 If the aircraft quotes flight authority which is not available with the ATS Unit, it shall not be accepted automatically. This may be verified with the DGCA or Air Hqrs., as the case may be, before permitting the flight to operate through Indian airspace.

16.5.1.2.1.5 ETA shall be passed to Customs, Immigration, Security and MLU Authorities.

16.5.1.2.2 Departure

16.5.1.2.2.1 On receipt of the Flight Plan, check if it has the valid authority or not.

16.5.1.2.2.2 Obtain FIC/ADC number.

16.5.1.2.2.3 No flight shall leave India without obtaining clearance from Customs and Immigration Authorities on General Declaration.

16.6 OPERATING PROCEDURES FOR NON-SCHEDULE INTERNATIONAL AIRCRAFT/SUSPICIOUS AIRCRAFT FORCED TO LAND

16.6.1 The Competent Authority requiring an aircraft to force-land will intimate Air Traffic Control by telephone the details of aircraft required to force-land.

16.6.2 The following procedures will be followed in handling non-schedule International aircraft/suspicious aircraft which is required to force-land.

i) The ATC, on receipt of information from the Competent Authority, will advise the aircraft to make a landing at the airport.

ii) The parking Bay will be earmarked for such force-landed aircraft, preferably an isolated bay wherever possible.

iii) An immediate action will be taken to inform the Head of the Police (CISF) unit or the second in command at the airport well before the estimated landing time of such an aircraft for security and guarding arrangements.

iv) The City Commissioner of Police/Superintendent of Police as well as the City Police Control Room must also be informed.

v) The Immigration/Customs Offices must be simultaneously alerted to prevent escape of the Crew/Passenger of the force-landed aircraft.

a) Immediate instructions must flow not to allow refueling of the aircraft under any circumstances.

b) Arrangements will be made to create some artificial obstruction in front of the parked aircraft to prevent its movement out of the Parking Bay such as positioning a CFT/Heavy Vehicle till such time the aircraft is authorized for take-off.

16.6.3 The Airport Police/Security Force shall make arrangements for guarding the aircraft on landing.

16.6.4 The entire action on the part of the ATC described above is to be carried out under the close supervision of Watch supervisory Officer (WSO) or the senior most ATC officer on duty.

16.7 Procedure for the Use of Reciprocal Runway:

16.7.1 Use of reciprocal runway may be approved only during the period when the traffic density is low. It shall not be approved in procedural environment. Whenever the aircraft is vectored for approach on the reciprocal runway the following procedures shall be followed:

i) Number two aircraft is descended to altitude 1000 ft. above the published missed approach altitude applicable to number one aircraft and kept at a distance proportionate to the assigned altitude.

ii) Number two aircraft is cleared for final approach only when the number one aircraft has landed.

iii) Should it become necessary to descend the number two aircraft to the published missed approach altitude, number one aircraft shall be advised of the revised missed approach procedure limiting missed approach altitude to 1000 ft. below the altitude assigned to number two aircraft. (Revised missed approach altitude shall not be less than applicable MSA). In such cases both aircrafts shall be informed of the traffic.

16.8 Glider operations

16.8.1 General

16.8.1.1 Glider flying will not normally take place when powered flying is in progress and in any case will not take place at aerodromes when local training flights of powered aircraft are in progress.

16.8.2 Signal

16.8.2.1 A double white cross displayed horizontally in the Signal Area indicates that the Aerodrome is being used by Gliders and the Glider flights are being performed.

16.8.3 Right of Way

16.8.3.1 Pilots of power-driven heavier-than-air aircraft shall give way to glider and also to an aircraft, which is seen to be towing such a glider at an aerodrome. Gliders shall give way to balloons.

16.8.4 Meteorological Minima

16.8.4.1 The meteorological conditions for a particular aerodrome shall be considered as below the minima for glider operation at that aerodrome:-

i) When the sky is overcast or when the cloud amount is 'BKN' in anyone layer and the cloud base is below 450 meters (1500 Ft) AGL.

ii) When the ground visibility is less than 5 Km.

iii) When the wind speed is more than 17 knots.

iv) When 'CB' cloud is reported, within 10 NM of ARP and below 3000 Ft.

v) During rains.

16.8.4.2 Gliding will not be permitted if meteorological conditions fall below the above specified Minima.

FEW'	*1 to 2 Oktas*
'SCT'	*3 to 4 Oktas*
'OVC'	*8 Oktas*

Table 16-1: Terms used for reporting of the cloud amount in local routine and special weather reports

16.8.4.3 Exception: When the Visibility is less than 5 Km. but more than 3 Km. Pilot holding Flight Instructors Rating (Glider) may be permitted to operate subject to following conditions:-

i) Authorization from Aerodrome Control Tower for such operation is obtained individually.

ii) Operation is coordinated by Aerodrome Control Tower with Approach Control Office.

iii) Only one Glider is flown at a time.

iv) Arrangements have been made for the termination of the flight if the flight cannot be continued with visual reference to terrain.

v) Gliding is confined to a radius of 2 km. from ARP and at or below circuit altitude.

16.8.5 Some of the special circumstances under which Glider flying may be permitted when powered flying is in progress or powered flying may be permitted when Glider flying is in progress, are given below:

i) A Glider which has failed to return within the time set aside for Glider flying due to favorable thermals has to be permitted to land when powered flying is in progress.

ii) An aircraft returning to base due to engine, instrument or any other trouble has to be permitted to land even when Glider flying is in progress.

iii) An aircraft towing a Glider has to be permitted to land when Glider flying is in progress.

16.8.6 When special circumstances of the type given above arise, all air traffic control units must ensure that adequate separation is maintained between the Glider and the powered aircraft and proper signals are given to the pilots of Glider/ powered aircraft.

16.9 Handling of Traffic on Reciprocal Track

16.9.1 **Factors for incidents on reciprocal track**

16.9.1.1 There may be lack of conceptual clarity on the issues of providing ATS Surveillance system based separation to aircraft on reciprocal tracks, human error in detecting conflict and appreciation of closure speed and rate of climb/descent limitations at higher levels in en-route phase of flights. Due to very high rate of closure of aircraft on reciprocal track, the clear airspace between aircraft diminishes very fast and availability of ATS Surveillance system place controller in false sense of security. Thus, many controllers are getting trapped by such type of separation plan that has no alerting check points and no escape route.

16.9.1.2 Lack of attention or lack of vigilance is contributory factors in approximately 50 percent of all Airprox incidents. Such human errors often happen during periods of light, non- complex traffic, particularly when controllers have to handle a small workload after peak traffic. They develop complacency and boredom which contribute to the frequency of such attention-related incidents. When there is stressful situation, it may also trigger tunnel vision in controllers who then overlook traffic relevant to their sector. When a controller becomes pre-occupied with a problem, therefore occupying all the available surveillance resources, this may lead to overlooking an aircraft, even if in the central area or in front of the aircraft which is given climb or descent. Short Term Conflict Alert (STCA) if provided, may occur too late to be effective in conflict avoidance in the vertical dimension and thus leading to a reliance on TCAS.

16.9.2 Generic Guidance

16.9.2.1 Surveillance controller must ensure correct brightness settings of situation display and not to obscure aircraft not under his/her control.

16.9.2.2 Surveillance controllers should avoid transferring aircraft to the next sector very early, especially when climb and descent is affected.

16.9.2.3 After peak periods, controllers may be relieved from the position or exchange positions on the sector in order to refocus and maintain a high concentration level.

16.9.2.4 Controllers shall avoid hasty decisions while considering request of level change. They may advise the pilot to stand-by while evaluating his/her request.

16.9.2.5 A Controller must ensure that aircraft is clear of conflicts before handing over to adjacent sector/centre, so that no unexpected manoeuvre will affect his/her traffic.

16.9.3 Specific Guidance for facilitating climb & descent on reciprocal track

16.9.3.1 Surveillance controllers, before affecting a level change, shall scan the area around the aircraft concerned to assess for any potential conflict. They should not be in a hurry to give climb and descen. Controllers should re-scan the situation display immediately after giving climb/descent. When ATC automation system permits, RBT/RBL/Min Sep tool may be used between conflicting traffic as a reminder of possible conflict. This will help in reducing human error in detection of conflict before authorizing climb/descent to the aircraft concerned. Surveillance controllers shall maintain a close coordination with procedural (Planning) controllers before affecting level change in en-route phase of the flight.

16.9.3.2 Procedural (Planning) controllers, before affecting a level change, shall scan the flight progress board for any potential conflict, particularly reciprocal traffic in bi- directional routes.

16.9.3.3 When the radar controller is intending to give climb/descend to an aircraft through the level of reciprocal aircraft; either of the following may be followed:

a) ATS surveillance system derived information indicate that both aircraft have passed each other and after passing each other, applicable radar separation is existing, or

b) One of the aircraft may be instructed to make parallel offset to route by at least the minimum distance of applicable ATS Surveillance system based separation and when established parallel offset track, level change may be affected. When vertical separation is achieved, offset can be cancelled and aircraft may be instructed to rejoin cleared flight route or direct next reporting point, or

c) One of the aircraft may be assigned tracks / headings which will facilitate applicable lateral ATS Surveillance system based separation minima until vertical separation minima are established. General guidelines for assigning heading/track are as appended below:

- *As a rule of thumb, vectoring angle to achieve lateral separation of X NM is X= [60/Distance]*X degrees*
- *To achieve 1 NM separation at 60 NM, vectoring angle = 60/60*1=1°.*

  Thus when an aircraft is given heading/track which is different by 1 degree, it will achieve lateral separation of 1NM at a distance of 60 NM.
- *Considering speed of 480 knots (i.e. 8 NM/min) of jet aircraft, distance between two aircraft on reciprocal track (relative speed 16 NM per min) in nil wind condition (10 minutes before traffic crossing each other)*

  *= 10 * 16 = 160NM.*
- *Degree of turn required to achieve 10NM separation (e.g. 10 NM radar separation minima) at crossing point at 80NM*

  *=(60/80)*10=7.5°.*
- *Thus to be more realistic and on a safer side, a turn of 10° will be enough to give more than 10 NM lateral separation, if aircraft are 160 NM apart and strong cross wind component is not there.*
- *Heading adjustment may be required depending upon reaction of pilot in executing ATC instruction, wind direction, aircraft speed etc.*

16.9.3.4 There may be a situation in which aircraft on laterally separated tracks are given clearances to climb or descend though the level of other aircraft, and there is likelihood of infringement of lateral separation minima due weather deviations, direct routings or any other reason. In such cases, action should be taken to level-off the aircraft concerned by applying vertical separation minimum and give further climb/descent only when appropriate separation minimum has been established.

16.9.3.5 While making offset or assigning heading from route/track, controller shall take care of traffic on adjacent routes/tracks.

16.9.3.6 Vigilance shall be maintained by the Surveillance controller so that in all circumstances at least one of the standard separations is maintained

16.9.3.7 While advising aircraft to fly offset or assigning heading from route/track, controllers shall take care of traffic on adjacent routes/tracks.

16.10 Resolution of conflicts during adverse weather conditions

16.10.1 Adverse Weather Conditions:

16.10.1.1 Impact on Flight Crew:

a) Cumulonimbus (CB) Clouds are serious hazards to aircraft operations. Flying into such clouds may lead to level bust/ loss of separation, structural damage, injuries to crew and passengers, and loss of control. Flight crews of aircraft equipped with weather radar are able to identify the areas of Cb activity and avoid such area either vertically or laterally to minimize the risk of encountering adverse weather.

b) The workload of flight crew increases significantly in circumnavigating such weather (where possible, flight crews try to avoid passing within 20 nm of a cumulonimbus cloud). They may encounter turbulence during which reduction in speed and/or level change may be required. Management of in-flight icing, deterioration of communication system and increased communication may also increase their workload.

16.10.1.2 Impact on Air Traffic Control:

16.10.1.2.1 When aircraft starts deviating from ATC cleared track or route, there is tremendous impact on an air traffic control due to following reasons:

- Increased workload of controller
- Disorderly traffic flow
- More conflict points
- Availability of less airspace for conflict resolution
- Unpredictability of traffic situation and unexpected manoeuvres by aircraft
- Increased manual coordination on intercom /telephone
- More communication with aircraft
- Likely infringement of airspace of adjacent sector or local flying/restricted

- area
- Requirement of larger separation, particularly when RVSM operation is to be suspended.
- Application of alternate separation when aircraft are flying on adjacent RNAV routes
- Presence of any aircraft requiring special attention. (e.g.,VIP, Medical, priority aircraft)

16.10.2 Strategies to reduce impact of deviations due to adverse weather conditions:

16.10.2.1 Controllers should take proper briefing about the presence of adverse weather. The source of such briefing may be meteorological reports, radar observations, briefing by previous controller or adjacent sector controllers and reports from pilots. Such briefing helps controllers in planning of traffic during adverse weather conditions. It may also help them in prior coordination with adjacent sectors of any deviations which are likely to affect them.

16.10.2.2 When aircraft requests deviation to avoid CB clouds/area of adverse weather activity, the controller should seek information from the flight crews on track(s)/heading(s) on which the aircraft will be flying, as well as the estimated duration and/or the distance the aircraft will proceed on such track(s)/heading(s). Such information from flight crew may not always be precise/accurate and therefore controllers should consider providing extra space for separation. This will also help in mitigating hazard

16.11 ATS Contingency Procedures to deal with public health emergencies like Pandemics and Communicable Disease Events

16.11.1 Notification of suspected Communicable Diseases, or other Public Health Risk, on board an aircraft

16.11.1.1 The flight crew of an en-route aircraft, upon identifying a suspected case(s) of communicable disease, or other public health risk, on board the aircraft, are required to notify promptly to the ATS unit with which the pilot is communicating, the information listed below:

a) aircraft identification;

b) departure aerodrome;

c) destination aerodrome;

d) estimated time of arrival;

e) number of persons on board;

f) number of suspected case(s) on board; and

g) nature of the public health risk, if known.

16.11.1.2 The ATS unit, upon receipt of information from a pilot regarding suspected case(s) of communicable disease or other public health risk, on board the aircraft, shall forward a message as soon as possible to the ATS unit serving the destination/departure and the aircraft operator or its designated representative.

16.11.1.3 When a report of a suspected case(s) of communicable disease or other public health risk, on board an aircraft is received by an ATS unit serving the destination/departure, from another ATS unit or from an aircraft or an aircraft operator, the unit concerned shall forward a message as soon as possible to the public health authority (PHA) or the appropriate designated authority as well as the aircraft operator or its designated representative, and the aerodrome authority.

Note 1.— The PHA is expected to contact the airline representative or operating agency and aerodrome authority, if applicable, for subsequent coordination with the aircraft concerning clinical details and aerodrome preparation. Depending on the communications facilities available to the airline representative or operating agency, it may not be possible to communicate with the aircraft until it is closer to its destination. Apart from the initial notification to the ATS unit whilst en-route, ATC communications channels are to be avoided.

Note 2.— The information to be provided to the departure aerodrome will prevent the potential spread of communicable disease, or other public health risk, through other aircraft departing from the same aerodrome.

Note 3.— AFTN (urgency message), telephone, facsimile or other means of transmission may be used.

16.11.2 **Procedures to deal with a situation of pandemics and communicable events:**

16.11.2.1 In the event of a pandemic or communicable event, all ATS personnel should be constantly reminded to monitor their health and watch out for symptoms of the notified pandemic /communicable disease. Those with the symptoms of such disease should be asked to consult a doctor immediately.

16.11.2.2 Advisory should also be issued by ATS Incharge of the concerned Airport/ATC Centre to discourage ATS personnel from traveling to affected areas. Application for leave to such areas should only be approved based on need basis.

16.11.2.3 There is possibility of reduced essential staffing due to such pandemic/communicable disease. ATS Incharges should assess essential staffing position and if required, ATS personnel on "General Duty" should be deployed in the shift and the leave of the ATS personnel who are not affected by such pandemic /communicable disease should be cancelled.

16.11.2.4 When it is not possible to manage the situation with such measures, ATS Incharge should inform ED (ATM) of the critical situation of staffing who may depute those ATS personnel from RHQ/CHQ/other airports/ATC centres/ATS training centres who have current ratings of that airport/ATC Centre to cover the shortage of ATS personnel.

16.12 Reducing Radio Telephony Frequency (RTF) Congestion

16.12.1 RT congestion significantly affects the correct flow of communications during all the phases of flights including critical phases such as take-off, departure, approach and landing, particularly at high-density airports/ATC Centres and therefore, require enhanced vigilance by pilots and controllers. Some of the causes of RT congestion are:

i. Long Routine transmissions and clearances,
ii. Unnecessary repetition of words and clearances,
iii. Use of Non-standard phraseologies,
iv. Unnecessary transmissions,
v. Traffic density,
vi. Complexity of Airspace/Procedures leading to complex and long clearance needing long read back or repetitions,
vii. Adverse weather conditions
viii. the way the message is transmitted-Hesitation, pauses and uncertainty in voice, forcing a confirmation or clarification by the listener, clipping of transmissions
ix. Unsatisfactory performance of VHF *I* poor quality of the communication channel etc.

16.12.2 It is imperative that the ATS In-charges analyse the RT transmissions made in ATS units at their stations by way of monitoring communications directly, Proficiency checks, remote monitoring or random VHF tape transcript and take measures to reduce and standardise the RT transmissions with due consideration to safety of aircraft operations.

16.12.3 Some of the measures which can be taken by the Air Traffic Controllers for reducing RT congestion in high density traffic are:

i. Avoid repetition of words and phrases except where it may be necessary for emphasis, for example, while giving a turn in the reverse direction, sudden change in earlier assigned runway etc.

ii. Maintain an even rate of speech not exceeding 100 words per minute to enable the pilot to monitor and if required copy the clearance correctly. This will avoid request for repetition of the part or whole of the clearance.

iii. Where available, use standard phraseologies to avoid ambiguity and need for corrections and clarifications.

iv. Avoid unnecessary transmissions such as "*Maintain Flight Level (level)* and *Report Position (or name of fix)*; or "*Report reaching/passing/leaving level (level)*" in surveillance environment when mode- C derived information has been verified, and *"Report rolling"* etc.

v. Avoid asking for position/level reports not mandatory for control or separation purposes. In Surveillance environment position reports should normally be avoided.

vi. Clear, confident and unambiguous communication reduces the risk that a message will be misunderstood. It is advisable to convey the message in the fewest words necessary to make your meaning clearly understood.

vii. Avoid passing too much information/clearances in one transmission. Long and complex ATC Clearances or information containing multiple pieces of information may either lead to selective hearing or possible error in correctly copying it. The controller may eventually be required to repeat whole or part of the instructions or it may also lead ATC to receive incorrect readback from aircraft. It will always be beneficial to use clear and concise messages.

viii. Controllers should time their transmissions by taking into account the coverage limits of VHF within Control Areas to avoid unnecessary calls and repetitions of instructions.

ix. Timeliness of transmission is very important for understanding of instructions and clearances by pilots. Therefore, controllers should restrict transmissions to bare minimum during increased pilot workload to avoid repetitions. Engine start, taxi, take-off and initial climb, Approach and landing; Abnormal or unusual occurrences such as equipment malfunction or extreme weather; and emergency or abnormal situations are the periods of increased workload.

x. Speech transmitting technique should be such that the highest possible intelligibility is incorporated in each transmission and should be adapted to the prevailing communications conditions.

xi. Avoid talking continuously, built breaks between successive transmissions to give opportunity to pilots to transmit.

xii. Another way of reducing RT congestion is by distributing the air traffic to different sectors. Where possible, ATC units may be planned with flexible sectors and the sectors available for operation should be opened as per the air traffic demand.

16.12.4 With their limited situational awareness, pilots may sometimes take up on RT, issues related with sequencing, direct routing, etc., although such things are discouraged by the Regulatory Authorities, as unnecessary arguments block RT channel. Therefore ATCOs are advised not to enter into unnecessary arguments on RT. Instead, the ATCOs should apprise pilots of the prevailing traffic condition, to enable them to have better situational awareness. Any unresolved issue, occurrence, complaint or grievance may appropriately be reported to concerned controlling authorities for redressal.

16.12.5 Finally, exchanging pleasantries in RT communication should be avoided.

CHAPTER 17

ATS SAFETY MANAGEMENT

Refer

CORPORATE SAFETY MANAGEMENT SYSTEM MANUAL OF AIRPORTS AUTHORITY OF INDIA

APPENDIX – A

FLIGHT PROGRESS STRIP MARKINGS

1. Strip Colour Code

1.1 The automated flight progress strips are white in colour, therefore, the colour of the strip holders will be used as per colour code.

1.2 In other cases when flight progress strips are coloured, the colour of flight progress strips will be used as per colour code.

FLIGHTS	COLOUR CODE
Arriving	Yellow
Departing	Blue
Local/Training/transit etc.	Pink

Table A-1: Colour code for Aerodrome Control/SMC/ Approach/Radar Control

FLIGHTS	COLOUR CODE
East bound	Yellow
West bound	Blue
Local/Training survey etc.	Pink

Table A-2: Colour Code for En-route Sectors

2. General Provisions

2.1 ATC Units shall ensure that, all the times, the strip annotations displayed indicate the current status of the flight.

2.2 In automated system, flight progress strips are normally printed in black. The controllers should preferably use red ink for annotation purposes as it is one of the most conspicuous colours.

2.3 In non-automated system, black / blue should be used for annotation purposes.

2.4 All handling should be neat, clear and concise.

2.5 Letters should be written in printed capitals.

2.6 Arabic numerals should be used in recording figures and time should be recorded in four digits.

2.7 Correction of errors should be made by crossing through the incorrect data with double horizontal data in the same box. Erasing / overwriting must not be made.

2.8 Updating of data on the strip should be achieved by crossing through the out-of-data information with a single line and inserting the new data within the same box.

2.9 Non-corrected / not updated data displayed on a flight progress strip should be assumed to have been verified as correct. No additional ticks or other markings shall be used to indicate that the data have been checked.

2.10 Levels should be recorded by using two or three figures representing hundreds of feet of altitude or flight levels as appropriate.

2.11 Planned cruising levels should be recorded in the appropriate box of the strip and, if approved when the clearance is issued, remain untouched.

2.12 Level changes should be tabulated downwards in order of occurrence. Levels to be checked in climb or descent may be shown separately alongside the climb/descent symbol.

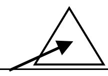
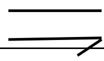
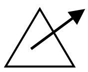
2.13 Estimated times of arrival (ETA) should be tabulated downwards in order of occurrence.

2.14 The time should be entered in four figures in the main estimate box, hours being in larger size than minutes. In all subsequent boxes, time should be entered in minutes only. In case the hour varies in the subsequent boxes, full four figure entries should be made.

2.15 Any item of an aircraft report, which is not in accordance with a previously issued clearance or approval, should be recorded alongside the correct data and circled. Any such information not corresponding to that recorded should immediately be checked with the aircraft.

3. Symbols Used in Flight Progress Strips

Above ……ft.	**+ ………..**
……..ft or above	**..……….+**
After passing	**/**
#Aircraft reported 'Security check completed	**S✓**
#Aircraft given time check	**T✓**
#Aircraft given appropriate altimeter setting read back correctly.	**Q✓**
#Aircraft instructed to hold e.g. Hold at DPN VOR Hold west of DPN VOR	**H** **H / DPN** **HW / DPN**
#Aircraft requested to adjust speed to ----- knots	**(….) K e.g. 250K**
#Aircraft requested to reduce speed by ----knots	**- (...) K e.g. - 20K**
#Aircraft requested to increase speed by ----knots	**+ (...) K e.g. + 20K**

Aircraft has reported at wrong level (indicated in the circle)	**80**
Alternative instructions	**(……..)**
Below ………ft,	**- ……..**
……..ft, or below	**…….. -**
Climb	↑
Climb co-coordinated	↑C
Climb Maintaining 1000 ft. above (aircraft)	↑ <u>(aircraft callsign)</u> 1
Descend maintaining 1000 ft. above (aircraft)	↓ ____1______ (aircraft callsign)
Climb when instructed by radar	**↑R**
Cleared to cross ATS Route	**X**
Clearance expires at (Time)	**CE / (time)**
#Co-ordination effected	~~C~~→
#Current Weather	**WX**
Delay not determined	**Z**
Descend	↓
Descend co-coordinated	C↓
Entering control airspace	
#Endurance on board	**QBD**
Expected approach time	**EAT**
##ILS	I
Joining ATS Route	
Leaving control airspace	
Maintain	~~M~~→
Missed Approach	**MA**
No delay expected	Λ
Outer marker	**OM**

Overhead	**QFG**
Overflight	V
On track	**Tr**
##Radar contact	**R**
##Radar service terminated	~~**R**~~
##Radar contact lost	~~**R**~~
##Radar vector for visual approach	**R/V**
##Radar vector for VOR approach	**R/ VOR**
##Radar vector for ILS approach	**R / I**
Release not before e.g. Release not before 3 minutes after KLM 475	(time or condition) **KLM475 +3**
Release subject to your discretion..(call sign or title, aircraft or agency)	**RSYD ……**
##Report leaving (level)	**RL**
##Report passing (level)	**RP**
##Report reaching (level)	**RR**
Request level change from	**RLC ….**
##Restriction written below this line e.g. Leave F280 at 1030 for F200	**280↓200** **1030**
Runway heading	**RH**
Surveillance radar approach	**SRA**
This information has been passed and acknowledged	✓
Turn left	↰
Turn right	↱
While in control airspace.	△

To be marked in miscellaneous box of the strip

To be marked in level or miscellaneous box of the strip depending upon space availability in level box.

Table A-3: Symbols used in Flight Progress strips

4. Strip Format and Marking

4.1 Flight Progress Strips format and marking in each ATC unit shall be as published in MATS- Part 2.

ANNEXURE 1

PRELIMINARY REPORT OF ATS INCIDENT

REPORT NUMBER

1. CLASSIFICATION ☐ AIRPROX ☐ PROCEDURAL ☐ FACILITY	2. DATE OF INCIDENT: 3. TIME OF INCIDENT:	4. ATS UNIT IN WHICH THE INCIDENT TOOK PLACE
5. INCIDENT REPORTED BY ☐ CONTROLLER ☐ SUPERVISOR ☐ PILOT 6. INCIDENT RECEIVED VIA ☐ RADIO ☐ TELEPHONE ☐ AFTN ☐ OTHERS	7. ALTITUDE OR FLIGHT LEVEL IN WHICH THE INCIDENT OCCURED ☐☐☐☐☐	

1. LOCATION OF THE INCIDENT	IN AIR				
	FIX	DIRECTION	DISTANCE	CLOSEST DISTANCE	
				HORIZONTAL	VERTICAL
	ON GROUND				
	RUNWAY:	TAXIWAY:	INTERSECTION:		

9. AIRCRAFT INFORMATION	AIRCRAFT NO. 1	AIRCRAFT NO. 2
A. IDENTIFICATION		
B. TYPE OF AIRCRAFT		
C. PLACE OF DEPARTURE		
D. DESTINATION		
E. ATS ROUTE		
F. LEVEL FLIGHT	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
G. CLIMBING	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
H. DESCENDING	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
I. EVASIVE ACTION	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
J. TAKE-OFF ROLL	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
K. LANDING ROLL	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
L. UNDER RADAR SERVICE	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
M. RADAR VECTORED	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
N. TRANSPONDER FUNCTIONING	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
O. MODE C FUNCTIONING	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN
P. RECEIVED TCAS/ ACAS RA	☐ YES ☐ NO ☐ UNKNOWN	☐ YES ☐ NO ☐ UNKNOWN

10. CONTROLLER INFORMATION

A. NAME: ____

B. SECTOR/POSITION: ____

C. TIME OF TAKING OVER CHANNEL BEFORE THE INCIDENT: ______________________

D. NO OF AIRCRAFT CONTROLLER WAS HANDLING AT THE TIME OF INCIDENT: ______________

E. WAS THE POSITION/SECTOR COMBINRD: ☐ NO ☐ YES (EXPLAIN) ______________________________   F. WAS TRAINING IN PROGRESS: ☐ NO ☐ YES (EXPLAIN) ____
11. WHETHER INCIDENT TOOK PLACE WITHIN SHORT TIME AFTER TAKING OVER CHANNEL: ☐ NO ☐ YES (EXPLAIN)
12. WAS THERE A TRANSITION FROM RADAR TO PROCEDURAL OR VICE VERSA: ☐ NO ☐ YES (EXPLAIN)
13. WHETHER CONFLICT ALERT WAS GENERATED BY THE SYSTEM: ☐ NO ☐ YES (EXPLAIN)
14. WHETHER MSAW WAS GENERATED BY THE SYSTEM: ☐ NO ☐ YES (EXPLAIN)
15. WHETHER EQUIPMENT/ NAV AIDS A FACTOR: ☐ NO ☐ YES (EXPLAIN)
16. BRIEF DESCRIPTION OF THE INCIDENT
17. PERSON MAKING NOTIFICATION: NAME: POSITION: SIGNATURE WITH DATE & TIME:
18. PERSON RECEIVING REPORT (WSO/ATS IN-CHARGE):   NAME: POSITION: SIGNATURE WITH DATE & TIME:

Report Number:
It should be written in a way that may help in keeping a track on number on ATC incident at a particular airport. The format should be: XXXX-YYY-00-01
XXXX is airport designator e.g. VABB, VIDP, etc
YYY is ATC unit e.g., TWR, ACC, APP, ACC, TAR, RSR, ADS, OCC, FIC etc.
00 is the last two digit of the year
01 is the incident number in sequence by year

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

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