

Kingdom of Saudi Arabia

Presidency of Meteorology and Environment



PME-Regulation for Meteorological Service for International Air Navigation

(PME-REG-MSFIAN) Section 3

Volume I: REGULATION
Volume II: APPENDICES AND ATTACHMENTS

FOREWORD

The following regulation governing the Provision of Meteorological Service for International Air Navigation (Section 3, Vol. I) in the Kingdom of Saudi Arabia (KSA) is prepared by the Presidency of Meteorology and Environment (PME).

Providing meteorological services in KSA are based on Royal Decrees No. 8903 dated (21/4/1401 H); and R. D. No. 202/A dated (19/8/1422 H); and while the regulation of this section are meant to be interrelated with ICAO Annex 3- Part I CORE SARPs; Part II of Annex 3 have been approved to be Vol. II Appendices and Attachments of this regulation, in addition to Amendment 74 applicable on 7 November 2007.

The promulgation of this Regulation is based as well on the designation of PME as the Meteorological Authority for the provision of meteorological services for international air navigation, submitted to ICAO by KSA State letter Ref. 6622/ 3/1 /7 dated 5/9/1417 H.

PME as the National Meteorological Service (NMS) in KSA for the provision of meteorological service for international air navigation is responsible for the preparation and distribution of this Regulation in sufficient quantities, so that all offices and users of meteorological information and products, obtain authentic copies, prior to the effective date of this Regulation.

Approved,

President,

Presidency of Meteorology and Environment (PME), Kingdom of Saudi Arabia

Turki Bin Nasser Bin Abdulaziz

Effective Date : / /

Introduction

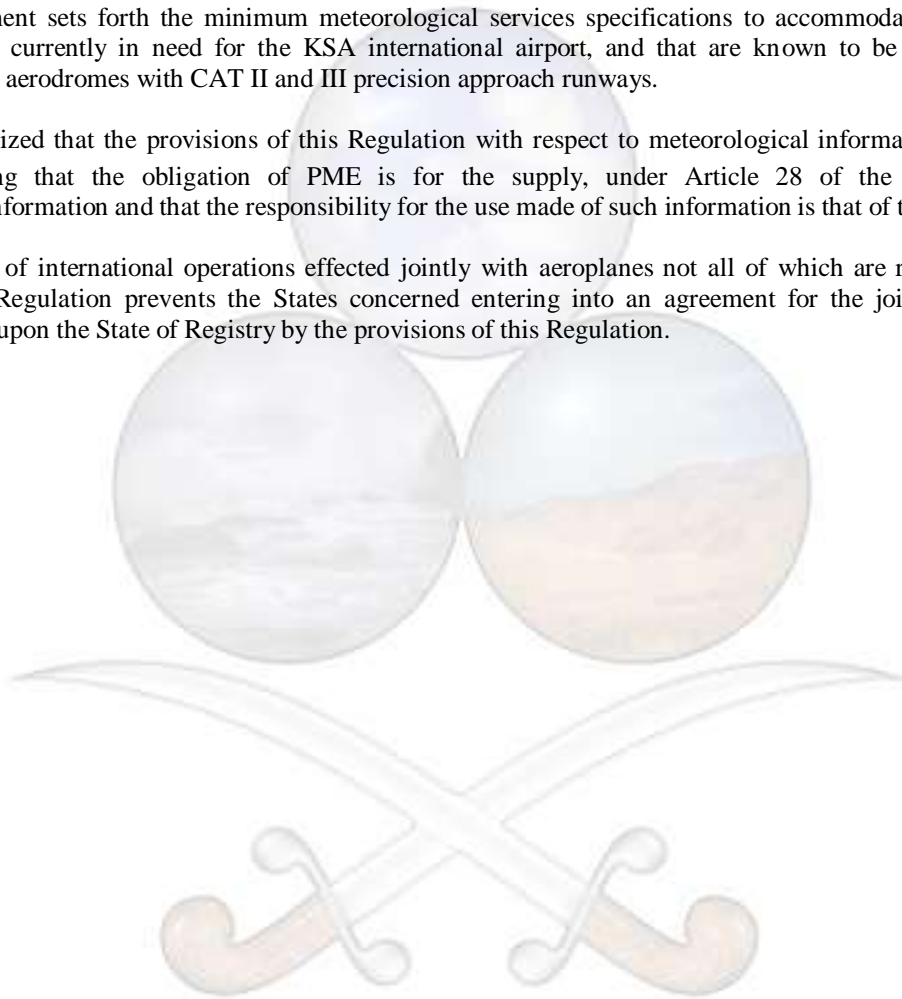
This section contains regulation that contains the specifications prescribed for the determination of meteorological service for international air navigation shall be to contribute towards the safety, regularity and efficiency of international air navigation.

To a great extent, the specification for individual services detailed in the Presidency of Meteorology and Environment Regulation (section 3) complies with the requirements of service for international air navigation (Annex 3), and in accordance with its ICAO Appendices and attachment to Annex 3 describe in the operational procedure of Met service supplied by PME.

This document sets forth the minimum meteorological services specifications to accommodate Air Navigation services that are currently in need for the KSA international airport, and that are known to be planned for future requirements for aerodromes with CAT II and III precision approach runways.

It is recognized that the provisions of this Regulation with respect to meteorological information are subject to the understanding that the obligation of PME is for the supply, under Article 28 of the Convention^(*), of meteorological information and that the responsibility for the use made of such information is that of the user.

In the case of international operations effected jointly with aeroplanes not all of which are registered in KSA, nothing in this Regulation prevents the States concerned entering into an agreement for the joint exercise of the functions placed upon the State of Registry by the provisions of this Regulation.



(*) Although the Convention on International Civil Aviation allocates to the State of Registry certain functions which that State is entitled to discharge, or obligated to discharge, as the case may be, the Assembly recognized, in Resolution A23-13, that the State of Registry may be unable to fulfil its responsibilities adequately in instances where aircraft are leased, chartered or interchanged — in particular without crew — by an operator of another State and that the Convention may not adequately specify the rights and obligations of the State of an operator in such instances until such time as Article 83 bis of the Convention enters into force. Accordingly, the Council urged that if, in the above-mentioned instances, the State of Registry finds itself unable to discharge adequately the functions allocated to it by the Convention, it delegate to the State of the Operator, subject to acceptance by the latter State, those functions of the State of Registry that can more adequately be discharged by the State of the Operator. It was understood that pending entry into force of Article 83 bis of the Convention the foregoing action would only be a matter of practical convenience and would not affect either the provisions of the Chicago Convention prescribing the duties of the State of Registry or any third State. However, as Article 83 bis of the Convention entered into force on 20 June 1997, such transfer agreements will have effect in respect of Contracting States which have ratified the related Protocol (Doc 9318) upon fulfilment of the conditions established in Article 83 bis.

MANUALS AND DOCUMENTS

The following ICAO and WMO manuals and reference documents related specifications of this Section have been approved by PME as guidance material.

Annex 5	Units of Measurements to be used in Air –and Ground Operations.
Annex 6	Operation of Aircraft, Part I.
Annex 10	Aeronautical Telecommunication Volume III, Part I.
Annex 11	Air traffic services.
Annex 15	Aeronautical Information Service: Chapter 3; Appendix 1, GEN 1-1.
Annex 16	Airworthiness
ICAO Doc. 9683	Human Training Manual.
ICAO Doc. 9766	Handbook on International Airways Volcano Watch-(IAVW).
ICAO Doc. 9377	Manual on the Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services.
ICAO Doc. 9328	Manual of Runway Visual Range Observing and Reporting Practices.
ICAO Doc. 7910	Location: Indicators.
ICAO Doc. 9161	Manual on Air Navigation Services Economics.
ICAO Doc. 9562	Airport Economics Manual.
WMO No. 306	Manual on Code: Volume 1.1 – Alpha –numerical Codes; Volume 1.2 - Binary Codes.
WMO Publication	No. 49, Technical Regulations Volume 1 – General Meteorological Standards and Recommended Practices: Chapter B4 - Education and Training.
WMO No. 258	Guidelines for the Training of Personnel in Meteorology And Operational Hydrology.
WMO No. 732	Guide to Practices of Meteorological Offices Serving Aviation.
WMO No. 904	Guide to Aeronautical Meteorological Services Cost Recovery.
WMO No. 1001	Guide on the Quality Management System for the Provision of Meteorological Service for International Air Navigation.

AMENDMENT PROCEDURE

The existing Meteorological services will be periodically reviewed to reflect the latest updates of International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs); it will be also amended to reflect the latest PME Regulation. A complete revised edition incorporating all amendments will be published every three years from the original effective date of this regulation. The amendment procedure shall be as follows;

1. When the PME receives an amendment to any of the current ICAO Annexes that can affect the provisions of this regulation, it will be forwarded by Deputy of Meteorology National Centre (DMNC) who in turn will provide a copy of this amendment to the concerned department for study and comments taking into account the ICAO deadline for the reply.
2. When any PME or stakeholder proposes an amendment to this regulation, it will send a letter with the proposed amendment including a clear justification and argument for such amendment. Following the receipt of an amendment proposal, DMNC will analyze this proposal and forward its comments and any proposed decision action to the DMNC.
3. An accepted amendment proposal will be prepared as draft amendment to the PME -Section 3 and forwarded to the originator of the amendment proposal and concerned PME department (s) for further review and comment within a specified timeline.
4. All accepted amendments will be drafted in the form of Notices of Proposed Amendments (NPA) and forwarded to all concerned parties including stakeholders for comment within a two-month reply period. The NPA shall indicate the proposed Amendment's effective date.
5. Following the receipt of NPA replies, the DMNC will analyze the comments received and produce a new draft in consultation with the concerned PME department. The final draft will be submitted to President of the General PME formal approval prior to publication.
6. The Amendment's effective date will take into account the comments of all the concerned parties and stakeholders.
7. Any differences between the PME Section 3 new amendment and ICAO Annexes Standards and Recommended Practices will be forwarded to ICAO and GACA as a Difference and published as it is in the Aeronautical Information Publication (AIP).
8. All concerned parties and stakeholders will be provided a copy of the new amendment and will be requested to update their copy of the PME Section 3 accordingly.
9. It is the responsibility of all concerned parties to keep their copy of PME-Section 3 and other PME regulation publication up to date.

AMENDMENT RECORD

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The background features a faint watermark illustration. It consists of three spheres arranged in a triangular pattern. The top sphere shows a cloudy sky. The bottom-left sphere shows a body of water. The bottom-right sphere shows a landscape with a sunset or sunrise. Below the spheres are two crossed swords with curved blades and ornate hilt guards.

Volume I

Regulation

CHAPTER 1. DEFINITIONS

1.1 Definitions

When the following terms are used in the Standards and Practices for Meteorological Service for International Air Navigation, they have the following meanings:

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

Aerodrome climatological summary. Concise summary of specified meteorological elements at an aerodrome, based on statistical data.

Aerodrome climatological table. Table providing statistical data on the observed occurrence of one or more meteorological elements at an aerodrome.

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 meteorological office. An office, located at an aerodrome, designated to provide meteorological service for international air navigation.

Aerodrome reference point. The designated geographical location of an aerodrome.

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 telecommunication network (AFTN). A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.

Aeronautical meteorological station. A station designated to make observations and meteorological reports for use in international air navigation.

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

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

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

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.

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

Note.— Details of the AIREP form are given in the PANS-ATM (Doc 4444).

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

^(*)The designation (RR) in these definitions indicates a definition which has been extracted from the Radio Regulations of the International Telecommunication Union (ITU) (see Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies (Doc 9718)).

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. Alternate aerodromes include the following:

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

En-route alternate An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition 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 may proceed 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 unit. A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

ATS-GACA. The relevant authority designated by the KSA responsible for providing air traffic services in the airspace concerned.

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

Automatic dependent surveillance (ADS). A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position and additional data as appropriate.

Briefing. Oral commentary on existing and/or expected meteorological conditions.

CFO. Central Forecast Office at MENC-DMNC-PME.

Cloud of operational significance. A cloud with the height of cloud base below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, or a cumulonimbus cloud or a towering cumulus cloud at any height.

Consultation. Discussion with a meteorologist or another qualified person of existing and/or expected meteorological conditions relating to flight operations; a discussion includes answers to questions.

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

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

DATA link-VOLMET (D-VOLMET). Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link.

DMNC. Deputy of Metrology and National Centre of PME.

DOM. Department of Observation and Methodology at DMNC-PME.

DPQ. Directorate of Project and Quality.

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

level.

Extended range operation. Any flight by an aeroplane with two turbine power-units where the flight time at the one power-unit inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator.

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

Flight documentation. Written or printed documents, including charts or forms, containing meteorological information for a flight.

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

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

Flight 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 a QFE altimeter setting, will indicate height above the QFE reference datum;*
- c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.*

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

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

GACA. *general authority for civil aviation*

GAMET area forecast. An area forecast in abbreviated plain language for low-level flights for a flight information region or sub-area thereof, prepared by the meteorological office designated by PME and exchanged with meteorological offices in adjacent flight information regions, as agreed between the meteorological authorities concerned.

GDPAD. General Directorate of Planning and Administrative Development at PME.

Grid point data in digital form. Computer processed meteorological data for a set of regularly spaced points on a chart, for transmission from a meteorological computer to another computer in a code form suitable for automated use.

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

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

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

International airways volcano watch (IAVW). International arrangements for monitoring and providing warnings to aircraft of volcanic ash in the atmosphere.

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

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

PME . Presidency of Meteorology and Environment The national authority providing or arranging for the provision of meteorological service for international air navigation in KSA.

Meteorological bulletin. A text comprising meteorological information preceded by an appropriate heading.

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.

Meteorological satellite. An artificial Earth satellite making meteorological observations and transmitting these observations to Earth.

Minimum sector altitude. The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on a radio aid to navigation.

NMEC. National Meteorological and Environment Centre at DMNC-PME.

Observation (meteorological). The evaluation of one or more meteorological elements.

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.

Operational flight plan. The operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

Operational planning. The planning of flight operations by an operator.

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

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.

Prevailing visibility. The greatest visibility value, observed in accordance with the definition of "visibility", which is reached within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.

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

Prognostic chart. A forecast of a specified meteorological element(s) for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart.

Quality assurance. Part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000*).

Quality control. Part of quality management focused on fulfilling quality requirements (ISO 9000*).

Quality management. Coordinated activities to direct and control an organization with regard to quality (ISO 9000*).

RCME. Regional Centre of Metrology and Environment at DMNC-PME.

Regional air navigation agreement. Agreement approved by the Council of ICAO normally on the advice of a

* ISO Standard 9000 — *Quality Management Systems — Fundamentals and Vocabulary*.

regional air navigation meeting.

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

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.

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

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

Search and rescue services unit. A generic term meaning, as the case may be, rescue coordination centre, rescue subcentre or alerting post.

SIDC. Scientific Information and Documentation Centre at DMNC-PME

SIGMET 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 aircraft operations.

Standard isobaric surface. An isobaric surface used on a worldwide basis for representing and analysing the conditions in the atmosphere.

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

Touchdown zone. The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

Tropical cyclone. Generic term for a non-frontal synoptic-scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation.

Tropical cyclone advisory centre (TCAC). A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, world area forecast centres and international OPMET databanks regarding the position, forecast direction and speed of movement, central pressure and maximum surface wind of tropical cyclones.

Upper-air chart. A meteorological chart relating to a specified upper-air surface or layer of the atmosphere.

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.

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

Volcanic ash advisory centre (VAAC). A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, area control centres, flight information centres, world area forecast centres and international OPMET databanks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions.

VOLMET. Meteorological information for aircraft in flight.

VOLMET broadcast. Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

World area forecast centre (WAFc). A meteorological centre designated to prepare and issue significant weather forecasts and upper-air forecasts in digital form on a global basis direct to States by appropriate means as part of the aeronautical fixed service.

World area forecast system (WAFS). A worldwide system by which world area forecast centres provide aeronautical meteorological en-route forecasts in uniform standardized formats.

CHAPTER 2. CONTENT RULES

Rules of Constructions

- a) To avoid any misunderstanding within this regulation, certain words are to be interpreted as having specific meanings when they are used, unless the context requires otherwise:
 - 1- Words importing the singular include the plural;
 - 2- Words importing the plural include the singular; and
 - 3- Words importing the masculine gender include the feminine
- b) In this regulation, the following protocol is used:
 - 1- The words "Shall" and "must" indicate that compliance is compulsory.
 - 2- The word "should" indicates a recommendation. It does not means that compliance is optional but rather that, where insurmountable difficulties exist, PME may accept an alternative means of compliance, provided that an acceptable safety assurance from the Aerodrome shows that the safety requirements will not be reduced below that intended by the requirement.
 - 3- The word "Can" or "May" is used in a permissive sense to PME or permission to do the act prescribed, and the words "no person may * * *" or "a person may not * * *" mean that no person is required, authorized, or permitted to do the act prescribed;
 - 4- The word "will" is used to express the future; and
 - 5- The word "Includes" means "includes but is not limited to".
- c) For the purpose of this Regulation, the following terms are used with a limited meaning as indicated below:
 - 1- to avoid confusion in respect of the term "service" between the meteorological service considered as an administrative entity and the service which is provided, "PME" is used for the former and "service" for the latter;
 - 2- "provide" is used solely in connection with the provision of service;
 - 3- "issue" is used solely in connection with cases where the obligation specifically extends to sending out the information to a user;
 - 4- "make available" is used solely in connection with cases where the obligation ends with making the information accessible to a user; and
 - 5- "supply" is used solely in connection with cases where either c) or d) applies.

2.1 Organization Structure

2.1.1 The objective of meteorological service for international air navigation shall be to contribute towards the safety, regularity and efficiency of international air navigation.

2.1.2 This objective shall be achieved by supplying the following users: operators, flight crew members, air traffic services units, search and rescue services units, airport managements and others concerned with the conduct or development of international air navigation, with the meteorological information necessary for the performance of their respective functions.

2.1.3 KSA determined PME the authorized agency for meteorological service which it will provide to meet the needs of international air navigation. This determination shall be made in accordance with the provisions of this Regulation and with due regard to regional air navigation agreements; it shall include the determination of the

meteorological service to be provided for international air navigation over international waters and other areas which lie outside the territory of the KSA.

2.1.4 PME will provide or to arrange for the provision of meteorological service for international air navigation on its behalf. Details of PME shall be included in the KSA aeronautical information publication, in accordance with (Annex 15, Appendix 1, GEN 1.1).

2.1.5 GDPAD-PME ensure that complies with the requirements of the World Meteorological Organization in respect of qualifications and training of meteorological personnel providing service for international air navigation.

Note.— Requirements concerning qualifications and training of meteorological personnel in aeronautical meteorology are given in WMO Publication No. 49, Technical Regulations, Volume I — General Meteorological Standards and Practices, Chapter B.4 — Education and Training.

2.2 Meteorological Information and Quality Assurance

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

2.2.2 *In order to meet the objective of meteorological service for international air navigation, PME ensure that referred to in 2.1.4 establishes and implements a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the users listed in 2.1.2.*

2.2.3 *The quality system established will be in accordance with 2.2.2 and will be practiced in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards in the future and will be certified by an approved organization.*

Note.— The International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme. The details of a successful programme are to be formulated by PME.

2.2.4 *NMEC, DOM, SIDC, RCME of DMNC-PME and OM at DPQ-PME assure the users that the meteorological information supplied complies with the stated requirements in terms of the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity, as well as the accuracy of measurements, observations and forecasts. When the quality system indicates that meteorological information to be supplied to the users does not comply with the stated requirements, and automatic error correction procedures are not appropriate, such information should not be supplied to the users unless it is validated with the originator.*

Note.— Requirements concerning the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity of meteorological information to be supplied to aeronautical users are given in Chapters 3, 4, 6, 7, 8, 9 and 10 and Appendices 2, 3, 5, 6, 7, 8 and 9 of this Section and the relevant regional air navigation plans. Guidance concerning the accuracy of measurement and observation, and accuracy of forecasts is given in Attachments A and B, respectively, to this Section.

2.2.5 *In regard to the exchange of meteorological information for operational purposes, the quality system include verification and validation procedures and resources for monitoring adherence to the prescribed transmission schedules for individual messages and/or bulletins required to be exchanged, and the times of their filing for transmission. The quality system should be capable of detecting excessive transit times of messages and bulletins received.*

Note.— Requirements concerning the exchange of operational meteorological information are given in Chapter 11 and Appendix 10 of this Section.

2.2.6 *The quality system applied is audited by National Meteorology and Environment Center (NMEC) to determine and correct the cause.*

2.2.7 The meteorological information supplied to the users listed in 2.1.2 shall be consistent with Human Factors principles and shall be in forms which require a minimum of interpretation by these users, as specified in the following chapters.

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

2.3 Notifications required from operators

2.3.1 An operator requiring meteorological service or changes in existing meteorological service shall notify, sufficiently in advance, PME meteorological office(s) concerned. The minimum amount of advance notice required shall be as agreed between DMNC-PME or meteorological office(s) and the operator.

2.3.2 PME meteorological office(s) shall be notified by the operator requiring service when:

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

Such information shall contain all details necessary for the planning of appropriate arrangements by PME .

2.3.3 The aerodrome meteorological office, or the meteorological office concerned, shall be notified by the operator or a flight crew member:

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

2.3.4 *The notification to the aerodrome meteorological office, or the meteorological office concerned, of individual flights should contain the following information, the requirement for some or all of this information may be waived by agreement between the meteorological office and the operator:*

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

CHAPTER 3. WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 2.

3.1 Objective of the world area forecast system

The objective of the world area forecast system shall be to supply meteorological authorities and other users with global aeronautical meteorological en-route forecasts in digital form. This objective shall be achieved through a comprehensive, integrated, worldwide and, as far as practicable, uniform system, and in a cost-effective manner, taking full advantage of evolving technologies.

3.2 World area forecast centres

3.2.1 State having accepted the responsibility for providing a WAFC within the framework of the world area forecast system, shall arrange for that centre:

- a) to prepare for grid points for all required levels global forecasts of:
 - 1) upper wind;
 - 2) upper-air temperature and humidity;
 - 3) geopotential altitude of flight levels;
 - 4) flight level and temperature of tropopause; and
 - 5) direction, speed and flight level of maximum wind;
- b) to prepare global forecasts of significant weather (SIGWX) phenomena;
- c) to issue the forecasts referred to in a) and b) in digital form to meteorological authorities and other users.
- d) to receive information concerning the accidental release of radioactive materials into the atmosphere from its associated WMO regional specialized meteorological centre (RSMC) for the provision of transport model products for radiological environmental emergency response, in order to include the information in SIGWX forecasts; and
- e) to establish and maintain contact with VAACs for the exchange of information on volcanic activity in order to coordinate the inclusion of information on volcanic eruptions in SIGWX forecasts.

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

Note.— Back-up procedures to be used in case of interruption of the operation of a WAFC are updated by the World Area Forecast System Operations Group (WAFSOPSG) as necessary; the latest revision can be found at the WAFSOPSG website at www.icao.int/anb/wafsopsg.

3.3 Meteorological offices

3.3.1 PME have meteorological offices which shall be adequate for the provision of the meteorological service required to satisfy the needs of international air navigation.

3.3.2 An aerodrome meteorological office shall carry out all or some of the following functions as necessary to meet the needs of flight operations at the aerodrome:

- a) prepare and/or obtain forecasts and other relevant information for flights with which it is concerned; the

extent of its responsibilities to prepare forecasts shall be related to the local availability and use of en-route and aerodrome forecast material received from other offices;

- b) prepare and/or obtain forecasts of local meteorological conditions;
- c) maintain a continuous survey of meteorological conditions over the aerodromes for which it is designated to prepare forecasts;
- d) provide briefing, consultation and flight documentation to flight crew members and/or other flight operations personnel;
- e) supply other meteorological information to aeronautical users;
- f) display the available meteorological information;
- g) exchange meteorological information with other meteorological offices; and
- h) supply information received on pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud, to its associated air traffic services unit, aeronautical information service unit and meteorological watch office as agreed between the meteorological, aeronautical information service and ATS-GACA.

3.3.3 The aerodrome meteorological offices at which flight documentation is required, as well as the areas to be covered, shall be determined by regional air navigation agreement.

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

3.3.5 For aerodromes without meteorological offices:

- a) PME shall designate one or more meteorological offices to supply meteorological information as required; and
- b) the PME shall establish means by which such information can be supplied to the aerodromes concerned.

3.4 Meteorological watch offices

3.4.1 PME, having accepted the responsibility for providing air traffic services within a flight information region or a control area, shall establish one or more meteorological watch offices.

3.4.2 A meteorological watch office shall:

- a) maintain watch over meteorological conditions affecting flight operations within its area of responsibility;
- b) prepare SIGMET and other information relating to its area of responsibility;
- c) supply SIGMET information and, as required, other meteorological information to associated air traffic services units;
- d) disseminate SIGMET information;
- e) when required by regional air navigation agreement, in accordance with 7.2.1:
 - 1) prepare AIRMET information related to its area of responsibility;
 - 2) supply AIRMET information to associated air traffic services units; and
 - 3) disseminate AIRMET information;
- f) supply information received on pre-eruption volcanic activity, a volcanic eruption and volcanic ash cloud for which a SIGMET has not already been issued, to its associated ACC/FIC, as agreed between the meteorological and ATS-GACA, and to its associated VAAC as determined by regional air navigation

agreement; and

- g) supply information received concerning the accidental release of radioactive materials into the atmosphere, in the area for which it maintains watch or adjacent areas, to its associated ACC/FIC, as agreed between the DMNC-PME and ATS-GACA, and to aeronautical information service units, as agreed between the PME and General Authority of Civil Aviation. The information shall comprise location, date and time of the accident, and forecast trajectories of the radioactive materials.

Note.— The information is provided, at the request of PME, by WMO regional specialized meteorological centres (RSMC) for the provision of transport model products for radiological environmental emergency response. The information is sent by the RSMC to a MNEC-DMNC-PME has the responsibility of redistributing the RSMC products within the KSA.

3.4.3 *The boundaries of the area over which meteorological watch is to be maintained by a meteorological watch office should, in so far as is practicable, be coincident with the boundaries of a flight information region or a control area or a combination of flight information regions and/or control areas.*

3.4.4 *Meteorological watch should be maintained continuously; however, in areas with a low density of traffic, the watch may be restricted to the period relevant to expected flight operations.*

3.5 Volcanic ash advisory centres

3.5.1 State, having accepted, by regional air navigation agreement, the responsibility for providing a VAAC within the framework of the international airways volcano watch, shall arrange for that centre to respond to a notification that a volcano has erupted, or is expected to erupt or volcanic ash is reported in its area of responsibility, by arranging for that centre to:

- a) monitor relevant geostationary and polar-orbiting satellite data to detect the existence and extent of volcanic ash in the atmosphere in the area concerned;
- b) activate the volcanic ash numerical trajectory/dispersion model in order to forecast the movement of any ash “cloud” which has been detected or reported;

Note.— The numerical model may be its own or, by agreement, that of another VAAC.

- c) issue advisory information regarding the extent and forecast movement of the volcanic ash “cloud” to:
 - 1) meteorological watch offices, area control centres and flight information centres serving flight information regions in its area of responsibility which may be affected;
 - 2) other VAACs whose areas of responsibility may be affected;
 - 3) world area forecast centres, international OPMET databanks, international NOTAM offices, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems; and
 - 4) airlines requiring the advisory information through the AFTN address provided specifically for this purpose; and

Note.— The AFTN address to be used by the VAACs is given in the Handbook on the International Airways Volcano Watch (IAVW) (Doc 9766) and at <http://www.icao.int/icao/en/anb/met/index.html>.

- d) issue updated advisory information to the meteorological watch offices, area control centres, flight information centres and VAACs referred to in c), as necessary, but at least every six hours until such time as the volcanic ash “cloud” is no longer identifiable from satellite data, no further reports of volcanic ash are received from the area, and no further eruptions of the volcano are reported.

3.5.2 Volcanic ash advisory centres shall maintain a 24-hour watch.

3.5.3 In case of interruption of the operation of a VAAC, its functions shall be carried out by another VAAC or another meteorological centre, as designated by the VAAC Provider State concerned.

Note.— Back-up procedures to be used in case of interruption of the operation of a VAAC are included in the Handbook on the International Airways Volcano Watch (IAVW) (Doc 9766).

3.6 Volcano observatories

KSA maintain volcano observatories monitoring active volcanoes and PME shall arrange the following:

- a) significant pre-eruption volcanic activity, or a cessation thereof;
- b) a volcanic eruption, or a cessation thereof; and/or c) volcanic ash in the atmosphere shall send this information as quickly as practicable to its associated ACC, MWO and VAAC.

Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.

3.7 Tropical cyclone advisory centres

State, having accepted, by regional air navigation agreement, the responsibility for providing TCAC and shall arrange for that centre to:

- a) monitor the development of tropical cyclones in its area of responsibility, using geostationary and polar-orbiting satellite data, radar data and other meteorological information;
- b) issue advisory information concerning the position of the cyclone centre, its direction and speed of movement, central pressure and maximum surface wind near the centre; in abbreviated plain language to:
 - 1) meteorological watch offices in its area of responsibility;
 - 2) other TCACs whose areas of responsibility may be affected; and
 - 3) world area forecast centres, international OPMET databanks, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems; and
- c) issue updated advisory information to meteorological watch offices for each tropical cyclone, as necessary, but at least every six hours.

CHAPTER 4. METEOROLOGICAL OBSERVATIONS AND REPORTS

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 3.

4.1 Aeronautical meteorological stations and observations

4.1.1 RCME-DMNC-PME shall establish, at aerodromes in its territory, such aeronautical meteorological stations as it determines to be necessary. An aeronautical meteorological station may be a separate station or may be combined with a synoptic station.

Note.— Aeronautical meteorological stations may include sensors installed outside the aerodrome, where considered justified, by DMNC-PME to ensure the compliance of meteorological service for international air navigation with the provisions of this Section.

4.1.2 DMNC-PME should establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of helicopter operations to offshore structures, if required by regional air navigation agreement.

4.1.3 Aeronautical meteorological stations shall make routine observations at fixed intervals. At aerodromes, the routine observations shall be supplemented by special observations whenever specified changes occur in respect of surface wind, visibility, runway visual range, present weather, clouds and/or air temperature.

4.1.4 DOM-DMNC-PME should arrange for its aeronautical meteorological stations to be inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly.

4.1.5 At aerodromes with runways intended for Category II and III instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations. These devices shall be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems shall observe Human Factors principles and include back-up procedures.

Note 1.— Categories of precision approach and landing operations are defined in (Annex 6, Part I).

Note 2.— Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (Doc 9683).

4.1.6 At aerodromes with runways intended for Category I instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure should be installed to support approach and landing and take-off operations. These devices should be practice to integrate automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and take-off operations. The design of integrated automatic systems should observe Human Factors principles and include back-up procedures.

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

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

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

Note.— Guidance on the operationally desirable accuracy of measurement or observation is given in Attachment A.

4.2 Agreement between PME and the ATS-GACA

An agreement between PME and the ATS-GACA have been established to cover, amongst other things:

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

Note.— Guidance on the subject of coordination between ATS-GACA and PME is contained in the Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377).

4.3 Routine observations and reports

4.3.1 At aerodromes, routine observations shall be made throughout the 24 hours each day, except as otherwise agreed between DMNC-PME, and ATS-GACA and the operator concerned. Such observations shall be made at intervals of one hour or, if so determined by regional air navigation agreement, at intervals of one half-hour. At other aeronautical meteorological stations, such observations shall be made as determined by DMNC-PME taking into account the requirements of air traffic services units and aircraft operations.

4.3.2 Reports of routine observations shall be issued as:

- a) local routine reports, only for dissemination at the aerodrome of origin, (intended for arriving and departing aircraft); and
- b) METAR for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET).

Note.— Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local routine report, in accordance with Annex 11, 4.3.6.1 g).

4.3.3 At aerodromes that are not operational throughout 24 hours in accordance with 4.3.1, METAR shall be issued prior to the aerodrome resuming operations in accordance with regional air navigation agreement.

4.4 Special observations and reports

4.4.1 A list of criteria for special observations shall be established by DMNC-PME, and ATS-GACA, operators and others concerned.

4.4.2 Reports of special observations shall be issued as:

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

Note.— Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local special report, in accordance with Annex 11, 4.3.6.1 g).

4.4.3 At aerodromes that are not operational throughout 24 hours in accordance with 4.3.1, following the

resumption of the issuance of METAR, SPECI shall be issued, as necessary.

4.5 Contents of reports

4.5.1 Local routine and special reports and METAR and SPECI shall contain the following elements in the order indicated:

- a) identification of the type of report;
- b) location indicator;
- c) time of the observation;
- d) identification of an automated or missing report, when applicable;
- e) surface wind direction and speed;
- f) visibility;
- g) runway visual range, when applicable;
- h) present weather;
- i) cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or, where measured, vertical visibility;
- j) air temperature and dew-point temperature; and
- k) QNH and, when applicable, QFE (QFE included only in local routine and special reports).

Note.— The location indicators referred to under b) and their significations are published in Location Indicators (Doc 7910).

4.5.2 *In addition to elements listed under 4.5.1 a) to k), local routine and special reports and METAR and SPECI should contain supplementary information to be placed after element k).*

4.5.3 Optional elements included under supplementary information shall be included in METAR and SPECI in accordance with regional air navigation agreement.

4.6 Observing and reporting meteorological elements

4.6.1 Surface wind

4.6.1.1 The mean direction and the mean speed of the surface wind shall be measured, as well as significant variations of the wind direction and speed, and reported in degrees true and kilometres per hour (or knots), respectively.

4.6.1.2 *When local routine and special reports are used for departing aircraft, the surface wind observations for these reports should be representative of conditions along the runway; when local routine and special reports are used for arriving aircraft, the surface wind observations for these reports should be representative of the touchdown zone.*

4.6.1.3 *For METAR and SPECI, the surface wind observations should be representative of conditions above the whole runway where there is only one runway and the whole runway complex where there is more than one runway.*

4.6.2 Visibility

4.6.2.1 The visibility as defined in Chapter 1 shall be measured or observed, and reported in metres or

kilometres.

Note.— *Guidance on the conversion of instrument readings into visibility is given in Attachment D.*

4.6.2.2 *When local routine and special reports are used for departing aircraft, the visibility observations for these reports should be representative of conditions along the runway; when local routine and special reports are used for arriving aircraft, the visibility observations for these reports should be representative of the touchdown zone of the runway.*

4.6.2.3 *For METAR and SPECI, the visibility observations should be representative of the aerodrome.*

4.6.3 Runway visual range

Note.— *Guidance on the subject of runway visual range is contained in the Manual of Runway Visual Range Observing and Reporting Practices (Doc 9328).*

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

4.6.3.2 *Runway visual range as defined in Chapter 1 should be assessed on all runways intended for use during periods of reduced visibility, including:*

- a) precision approach runways intended for Category I instrument approach and landing operations; and*
- b) runways used for take-off and having high-intensity edge lights and/or centre line lights.*

Note.— *Precision approach runways are defined in Annex 14, Volume I, Chapter 1, under “Instrument runway”.*

4.6.3.3 The runway visual range, assessed in accordance with 4.6.3.1 and 4.6.3.2, shall be reported in metres throughout periods when either the visibility or the runway visual range is less than 1 500 m.

4.6.3.4 Runway visual range assessments shall be representative of:

- a) the touchdown zone of the runway intended for non-precision or Category I instrument approach and landing operations;
- b) the touchdown zone and the mid-point of the runway intended for Category II instrument approach and landing operations; and
- c) the touchdown zone, the mid-point and stop-end of the runway intended for Category III instrument approach and landing operations.

4.6.3.5 The units providing air traffic service and aeronautical information service for an aerodrome shall be kept informed without delay of changes in the serviceability status of the automated equipment used for assessing runway visual range.

4.6.4 Present weather

4.6.4.1 The present weather occurring at the aerodrome and/or its vicinity shall be observed and reported as necessary. The following present weather phenomena shall be identified, as a minimum: precipitation and freezing precipitation (including intensity thereof), fog, freezing fog and thunderstorms (including thunderstorms in the vicinity).

4.6.4.2 *For local routine and special reports, the present weather information should be representative of conditions at the aerodrome.*

4.6.4.3 *For METAR and SPECI, the present weather information should be representative of conditions at the aerodrome and, for certain specified present weather phenomena, in its vicinity.*

4.6.5 Clouds

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

4.6.5.2 *Cloud observations for local routine and special reports should be representative of the approach area.*

4.6.5.3 *Cloud observations for METAR and SPECI should be representative of the aerodrome and its vicinity.*

4.6.6 Air temperature and dew-point temperature

4.6.6.1 The air temperature and the dew-point temperature shall be measured and reported in degrees Celsius.

4.6.6.2 *Observations of air temperature and dew-point temperature for local routine and special reports and METAR and SPECI should be representative of the whole runway complex.*

4.6.7 Atmospheric pressure

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

4.6.8 Supplementary information

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

4.7 Reporting meteorological information from automatic observing systems

4.7.1 *METAR and SPECI from automatic observing systems should be used by KSA in a position to do so during non-operational hours of the aerodrome, and during operational hours of the aerodrome as determined by PME in consultation with users based on the availability and efficient use of personnel. METAR and SPECI from automatic observing systems must be approved by human factor.*

Note.— Guidance on the use of automatic meteorological observing systems is given in the Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc 9837).

4.7.2 METAR and SPECI from automatic observing systems shall be identified with the word “AUTO”.

4.8 Observations and reports of volcanic activity

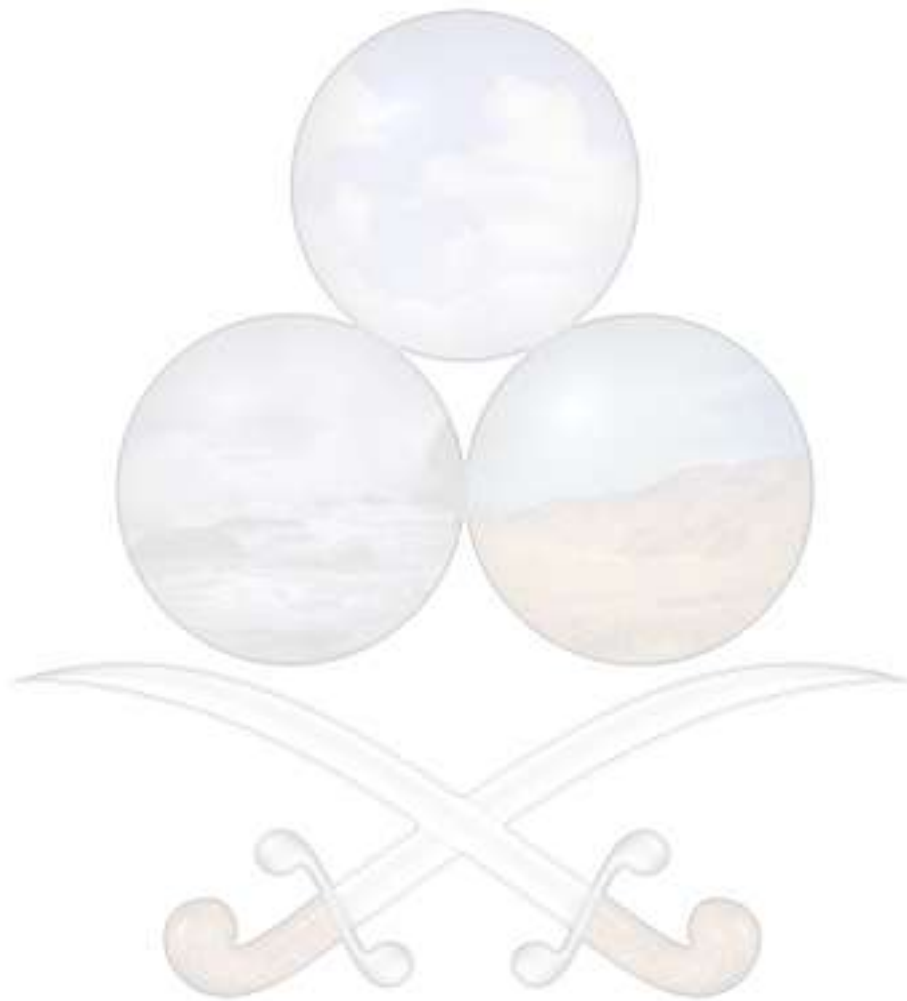
The occurrence of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud should be reported without delay to the associated air traffic services unit, aeronautical information services unit and meteorological watch office. The report should be made in the form of a volcanic activity report comprising the following information in the order indicated:

- a) message type, VOLCANIC ACTIVITY REPORT;*
- b) station identifier, location indicator or name of station;*
- c) date/time of message;*

d) *location of volcano and name if known; and*

e) *concise description of event including, as appropriate, level of intensity of volcanic activity, occurrence of an eruption and its date and time, and the existence of a volcanic ash cloud in the area together with direction of ash cloud movement and height.*

Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.



CHAPTER 5. AIRCRAFT OBSERVATIONS AND REPORTS

Note.—Technical specifications and detailed criteria related to this chapter are given in Appendix 4.

5.1 Obligations

PME shall arrange, according to the provisions of this chapter, for observations to be made by aircraft of its registry operating on international air routes and for the recording and reporting of these observations.

5.2 Types of aircraft observations

The following aircraft observations shall be made:

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

5.3 Routine aircraft observations — designation

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

5.3.2 When voice communications are used, routine observations shall be made during the en-route phase in relation to those air traffic services reporting points or intervals:

- a) at which the applicable air traffic services procedures require routine position reports; and
- b) which are those separated by distances corresponding most closely to intervals of one hour of flying time.

5.3.3 *For helicopter operations to and from aerodromes on offshore structures, routine observations should be made from helicopters at points and times as agreed between the DMNC-PME and the helicopter operators concerned.*

5.3.4 In the case of air routes with high-density air traffic (e.g. organized tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with 5.3.1 or 5.3.2, as appropriate. The designation procedures shall be subject to regional air navigation agreement.

5.3.5 In the case of the requirement to report during the climb-out phase, an aircraft shall be designated, at approximately hourly intervals, at each aerodrome to make routine observations in accordance with 5.3.1.

5.4 Routine aircraft observations — exemptions

5.4.1 When voice communications are used, an aircraft shall be exempted from making the routine observations specified in 5.3.2 when:

- a) the aircraft is not equipped with RNAV equipment; or b) the flight duration is 2 hours or less; or
- c) the aircraft is at a distance equivalent to less than one hour of flying time from the next intended point of landing; or
- d) the altitude of the flight path is below 1 500 m (5 000 ft).

5.4.2 *When voice communications are used, additional exemptions may be prescribed by regional air navigation agreement for flights over routes and areas with high-density air traffic and/or with adequate synoptic networks. Such procedures should take the form of exemption or designation procedures and should:*

- a) *make it possible for the minimum requirements for aircraft observations of all meteorological offices concerned to be met; and*
- b) *be as simple as possible to implement and preferably not involving consideration of individual cases.*

5.5 Special aircraft observations

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

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

Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.

5.6 Other non-routine aircraft observations

When other meteorological conditions not listed under 5.5, e.g. wind shear, are encountered and which, in the opinion of the pilot-in-command, may affect the safety or markedly affect the efficiency of other aircraft operations, the pilot-in-command shall advise the appropriate air traffic services unit as soon as practicable.

Note.— Icing, turbulence and, to a large extent, wind shear are elements which, for the time being, cannot be satisfactorily observed from the ground and for which in most cases aircraft observations represent the only available evidence.

5.7 Reporting of aircraft observations during flight

5.7.1 Aircraft observations shall be reported by air-ground data link. Where air-ground data link is not available or appropriate, aircraft observations during flight shall be reported by voice communications.

5.7.2 Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable.

5.7.3 Aircraft observations shall be reported as air-reports.

5.8 Relay of air-reports by ATS units

DMNC-PME shall make arrangements with the ATS-GACA to ensure that, on receipt by the ATS units of:

- a) routine and special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office;
- b) routine air-reports by data link communications, the ATS units relay them without delay to WAFCS; and
- c) special air-reports by data link communications, the ATS units relay them without delay to their associated meteorological watch office and WAFCS.

5.9 Recording and post-flight reporting of aircraft observations of volcanic activity

Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form. A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of PME, could be affected by volcanic ash clouds.



CHAPTER 6. FORECASTS

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 5.

6.1 Interpretation and use of forecasts

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

Note.— Guidance on the operationally desirable accuracy of forecasts is given in Attachment B.

6.1.2 The issue of a new forecast by CFO-MNEC, such as a routine aerodrome forecast, shall be understood to cancel automatically any forecast of the same type previously issued for the same place and for the same period of validity or part thereof.

6.2 Aerodrome forecasts

6.2.1 An aerodrome forecast shall be prepared by CFO-MNEC.

6.2.2 An aerodrome forecast shall be issued at a specified time and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period.

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

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

Optional elements shall be included in TAF in accordance with regional air navigation agreement.

Note.— The visibility included in TAF refers to the forecast prevailing visibility.

6.2.4 CFO-MNEC preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly. The length of the forecast messages and the number of changes indicated in the forecast shall be kept to a minimum.

Note.— Guidance on methods to keep TAF under continuous review is given in Chapter 3 of the Manual of

Aeronautical Meteorological Practice (Doc 8896).

6.2.5 TAF that cannot be kept under continuous review shall be cancelled.

6.2.6 *The period of validity of a routine TAF should be not less than 6 hours nor more than 30 hours; the period of validity should be determined by regional air navigation agreement. Routine TAF valid for less than 12 hours should be issued every 3 hours and those valid for 12 to 30 hours should be issued every 6 hours.*

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

6.3 Landing forecasts

6.3.1 A landing forecast shall be prepared by PME meteorological office as determined by regional air navigation agreement; such forecasts are intended to meet the requirements of local users and of aircraft within about one hour's flying time from the aerodrome.

6.3.2 Landing forecasts shall be prepared in the form of a trend forecast.

6.3.3 A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at that aerodrome to be appended to a local routine or local special report, or a METAR or SPECI. The period of validity of a trend forecast shall be 2 hours from the time of the report which forms part of the landing forecast.

6.4 Forecasts for take-off

6.4.1 A forecast for take-off shall be prepared by PME meteorological office.

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

6.4.3 *A forecast for take-off should be supplied to operators and flight crew members on request within the 3 hours before the expected time of departure.*

6.4.4 *PME-Meteorological offices preparing forecasts for take-off should keep the forecasts under continuous review and, when necessary, should issue amendments promptly.*

6.5 Area forecasts for low-level flights

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

6.5.2 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with 7.2.1, area forecasts for such operations shall be prepared in a format agreed upon between the Meteorological authorities concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, the forecast shall be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights.

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

CHAPTER 7. SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 6.

7.1 SIGMET information

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

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

7.1.3 The period of validity of a SIGMET message shall be not more than 4 hours. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, the period of validity shall be extended up to 6 hours.

7.1.4 *SIGMET messages concerning volcanic ash cloud and tropical cyclones should be based on advisory information provided by VAACs and TCACs, respectively, designated by regional air navigation agreement.*

7.1.5 Close coordination shall be maintained between PME meteorological watch office and the associated area control centre/flight information centre to ensure that information on volcanic ash included in SIGMET and NOTAM messages is consistent.

7.1.6 SIGMET messages shall be issued not more than 4 hours before the commencement of the period of validity. In the special case of SIGMET messages for volcanic ash cloud and tropical cyclones, these messages shall be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity. SIGMET messages for volcanic ash and tropical cyclones shall be updated at least every 6 hours.

7.2 AIRMET information

7.2.1 AIRMET information shall be issued by PME meteorological watch office in accordance with regional air navigation agreement, taking into account the density of air traffic operating below flight level 100. AIRMET information shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, which have not been included in Section I of the area forecast for low-level flights issued in accordance with Chapter 6, Section 6.5 and which may affect the safety of low-level flights, and of the development of those phenomena in time and space.

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

7.2.3 The period of validity of an AIRMET message shall be not more than 4 hours.

7.3 Aerodrome warnings

7.3.1 Aerodrome warnings shall be issued by the meteorological office and shall give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services.

7.3.2 *Aerodrome warnings should be cancelled when the conditions are no longer occurring and/or no longer expected to occur at the aerodrome.*

7.4 Wind shear warnings and alerts

Note.— Guidance on the subject is contained in the Manual on Low-level Wind Shear (Doc 9817). Wind shear alerts are expected to complement wind shear warnings and together are intended to enhance situational awareness of wind shear.

7.4.1 Wind shear warnings shall be prepared by PME meteorological office for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the ATS unit and operators concerned. Wind shear warnings shall give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or take-off path or during circling approach between runway level and 500 m (1 600 ft) above that level and aircraft on the runway during the landing roll or take-off run. Where local topography has been shown to produce significant wind shears at heights in excess of 500 m (1 600 ft) above runway level, then 500 m (1 600 ft) shall not be considered restrictive.

7.4.2 Wind shear warnings for arriving aircraft and/or departing aircraft should be cancelled when aircraft reports indicate that wind shear no longer exists or, alternatively, after an agreed elapsed time. The criteria for the cancellation of a wind shear warning should be defined locally for each aerodrome, as agreed between DMNC- PME, the ATS-GACA and the operators concerned.

7.4.3 At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems shall be issued. Wind shear alerts shall give concise, up-to-date information related to the observed existence of wind shear involving a headwind/tailwind change of 30 km/h (15 kt) or more which could adversely affect aircraft on the final approach path or initial take-off path and aircraft on the runway during the landing roll or take-off run.

7.4.4 Wind shear alerts should be updated at least every minute. The wind shear alert should be cancelled as soon as the headwind/tailwind change falls below 30 km/h (15 kt).

CHAPTER 8. AERONAUTICAL CLIMATOLOGICAL INFORMATION

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 7.

8.1 General provisions

Note.— In cases where it is impracticable to meet the requirements for aeronautical climatological information on a national basis, the collection, processing and storage of observational data may be effected through computer facilities available for international use, and the responsibility for the preparation of the required aeronautical climatological information may be delegated by agreement between the meteorological authorities concerned.

8.1.1 Aeronautical climatological information required for the planning of flight operations shall be prepared in the form of aerodrome climatological tables and aerodrome climatological summaries. Such information shall be supplied to aeronautical users as agreed between DMNC-PME and those users.

Note.— Climatological data required for aerodrome planning purposes are set out in Annex 14, Volume I, 3.1.4 and in Attachment A.

8.1.2 Aeronautical climatological information should normally be based on observations made over a period of at least five years and the period should be indicated in the information supplied.

8.1.3 Climatological data related to sites for new aerodromes and to additional runways at existing aerodromes should be collected starting as early as possible before the commissioning of those aerodromes or runways.

8.2 Aerodrome climatological tables

DMNC-PME should make arrangements for collecting and retaining the necessary observational data and have the capability:

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

8.3 Aerodrome climatological summaries

Aerodrome climatological summaries should follow the procedures prescribed by the World Meteorological Organization. Where computer facilities are available to store, process and retrieve the information, the summaries should be published or otherwise made available to aeronautical users on request. Where such computer facilities are not available, the summaries should be prepared using the models specified by the World Meteorological Organization and should be published and kept up to date as necessary.

8.4 Copies of meteorological observational data

SIDC-DMNC, on request and to the extent practicable, shall make available to operators and to others concerned with the application of meteorology to international air navigation, meteorological observational data required for research, investigation or operational analysis.

CHAPTER 9. SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 8.

9.1 General provisions

9.1.1 Meteorological information shall be supplied to operators and flight crew members for:

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

9.1.2 Meteorological information supplied to operators and flight crew members shall cover the flight in respect of time, altitude and geographical extent. Accordingly, the information shall relate to appropriate fixed times, or periods of time, and shall extend to the aerodrome of intended landing, also covering the meteorological conditions expected between the aerodrome of intended landing and alternate aerodromes designated by the operator.

9.1.3 Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as established by DMNC-PME in consultation with operators concerned:

- a) forecasts of
 - 1) upper wind and upper-air temperature;
 - 2) upper-air humidity;
 - 3) geopotential altitude of flight levels;
 - 4) flight level and temperature of tropopause;
 - 5) direction, speed and flight level of maximum wind; and
 - 6) SIGWX phenomena;

Note.— Forecasts of upper-air humidity and geopotential altitude of flight levels are used only in automatic flight planning and need not be displayed.

- b) METAR or SPECI (including trend forecasts as issued in accordance with regional air navigation agreement) for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;
- c) TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;
- d) forecasts for take-off;
- e) SIGMET information and appropriate special air-reports relevant to the whole route;

Note.— Appropriate special air-reports will be those not already used in the preparation of SIGMET.

- f) subject to regional air navigation agreement, GAMET area forecast and/or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route;

- g) aerodrome warnings for the local aerodrome;
- h) meteorological satellite images; and
- i) ground-based weather radar information.

9.1.4 Forecasts listed under 9.1.3 a) shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between DMNC-PME and the operator concerned.

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

9.1.6 Charts generated from the digital forecasts provided by the WAFCs shall be made available, as required by operators, for fixed areas of coverage as shown in Appendix 8, Figures A8-1, A8-2 and A8-3.

9.1.7 When forecasts of upper wind and upper-air temperature listed under 9.1.3 a) 1) are supplied in chart form, they shall be fixed time prognostic charts for flight levels as specified in Appendix 2, 1.2.2 a). When forecasts of SIGWX phenomena listed under 9.1.3 a) 6) are supplied in chart form, they shall be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified in Appendix 2, 1.3.2 and Appendix 5, 4.3.2.

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

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

9.1.10 Meteorological information shall be supplied to operators and flight crew members at the location to be determined by PME met office, after consultation with the operators and at the time to be agreed upon between the meteorological office and the operator concerned. The service for pre-flight planning shall be confined to flights originating within the territory of the KSA. At an aerodrome without a meteorological office, arrangements for the supply of meteorological information shall be as agreed upon between DMNC-PME and the operator concerned.

9.2 Briefing, consultation and display

Note.— The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are given in 9.4.

9.2.1 Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations personnel. Its purpose shall be to supply the latest available information on existing and expected meteorological conditions along the route to be flown, at the aerodrome of intended landing, alternate aerodromes and other aerodromes as relevant, either to explain and amplify the information contained in the flight documentation or, if so agreed between DMNC-PME and the operator, in lieu of flight documentation.

9.2.2 Meteorological information used for briefing, consultation and display shall include any or all of the information listed in 9.1.3.

9.2.3 If the meteorological office expresses an opinion on the development of the meteorological conditions at an aerodrome which differs appreciably from the aerodrome forecast included in the flight documentation, the attention of flight crew members shall be drawn to the divergence. The portion of the briefing dealing with the divergence shall be recorded at the time of briefing and this record shall be made available to the operator.

9.2.4 The required briefing, consultation, display and/or flight documentation shall normally be provided by the meteorological office associated with the aerodrome of departure. At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed upon between DMNC-PME and the operator concerned. In exceptional circumstances, such as an undue delay, the meteorological office associated

with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary.

9.2.5 *The flight crew member or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested should visit the meteorological office at the time agreed upon between the meteorological office and the operator concerned. Where local circumstances at an aerodrome make personal briefing or consultation impracticable, the meteorological office should provide those services by telephone or other suitable telecommunications facilities.*

9.3 Flight documentation

Note.— The requirements for the use of automated pre-flight information systems in providing flight documentation are given in 9.4.

9.3.1 Flight documentation to be made available shall comprise information listed under 9.1.3 a) 1) and 6), b), c), e) and, if appropriate, f). However, when agreed between DMNC-PME and operator concerned, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally needed, but in all cases the flight documentation shall at least comprise information on 9.1.3 b), c), e) and, if appropriate, f).

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

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

9.3.4 DMNC-PME shall retain information supplied to flight crew members, either as printed copies or in computer files, for a period of at least 30 days from the date of issue. This information shall be made available, on request, for inquiries or investigations and, for these purposes, shall be retained until the inquiry or investigation is completed.

9.4 Automated pre-flight information systems for briefing, consultation, flight planning and flight documentation

9.4.1 Where the PME uses automated pre-flight information systems to supply and display meteorological information to operators and flight crew members for self-briefing, flight planning and flight documentation purposes, the information supplied and displayed shall comply with the relevant provisions in 9.1 to 9.3 inclusive.

9.4.2 *Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned should be established by an agreement between PME and General Authority of Civil Aviation or the agency to which the authority to provide service has been delegated in accordance with Annex 15, 3.1.1 c).*

Note.— The meteorological and aeronautical information services information concerned is specified in 9.1 to 9.3 and Appendix 8 and in Annex 15, 8.1 and 8.2, respectively.

9.4.3 Where automated pre-flight information systems are used to provide for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned, PME shall remain responsible for the quality control and quality management of meteorological information provided by means of such systems in accordance with Chapter 2, 2.2.2.

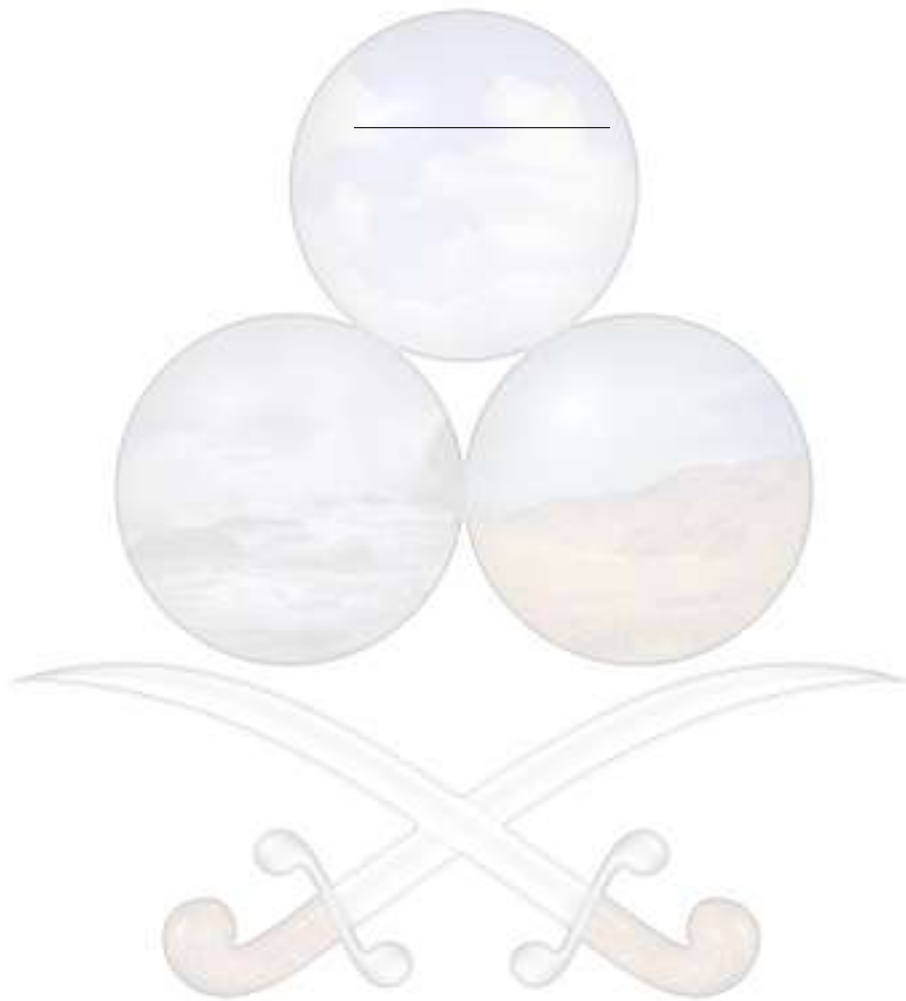
Note.— The responsibilities relating to aeronautical information services information and the quality assurance of the information are given in Annex 15, Chapter 3.

9.5 Information for aircraft in flight

9.5.1 Meteorological information for use by aircraft in flight shall be supplied by a meteorological office to its associated air traffic services unit and through D-VOLMET or VOLMET broadcasts as determined by regional air navigation agreement. Meteorological information for planning by the operator for aircraft in flight shall be supplied on request, as agreed between DMNC-PME and the operator concerned.

9.5.2 Meteorological information for use by aircraft in flight shall be supplied to air traffic services units in accordance with the specifications of Chapter 10.

9.5.3 Meteorological information shall be supplied through D-VOLMET or VOLMET broadcasts in accordance with the specifications of Chapter 11.



CHAPTER 10. INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 9.

10.1 Information for air traffic services units

10.1.1 PME shall designate a meteorological office to be associated with each air traffic services unit. The associated meteorological office shall, after coordination with the air traffic services unit, supply, or arrange for the supply of, up-to-date meteorological information to the unit as necessary for the conduct of its functions.

10.1.2 *The associated meteorological office for an aerodrome control tower or approach control unit should be an aerodrome meteorological office.*

10.1.3 The associated meteorological office for a flight information centre or an area control centre shall be a meteorological watch office.

10.1.4 *Where, owing to local circumstances, it is convenient for the duties of an associated meteorological office to be shared between two or more meteorological offices, the division of responsibility should be determined by DMNC-PME in consultation with the ATS-GACA.*

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

10.2 Information for search and rescue services units

PME Meteorological offices in accordance with regional air navigation agreement shall supply search and rescue services units with the meteorological information they require in a form established by mutual agreement. For that purpose, PME meteorological office shall maintain liaison with the search and rescue services unit throughout a search and rescue operation.

10.3 Information for aeronautical information services units

DMNC-PME, in coordination with the appropriate General Authority of Civil Aviation (GACA), shall arrange for the supply of up- to-date meteorological information to relevant aeronautical information services units, as necessary, for the conduct of their functions.

CHAPTER 11. REQUIREMENTS FOR AND USE OF COMMUNICATIONS

Note 1.— Technical specifications and detailed criteria related to this chapter are given in Appendix 10.

Note 2.— It is recognized that it is for KSA to decide upon its own internal organization and responsibility for implementing the telecommunications facilities referred to in this chapter.

11.1 Requirements for communications

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

Note.— Circuits of the aeronautical fixed service are used for the collection and regional and interregional exchanges of operational meteorological information as well as for access to international operational meteorological databanks. Three aeronautical fixed service satellite distribution systems providing for global coverage are used to support the regional and interregional exchanges of operational meteorological information. Provisions relating to the satellite distribution systems are given in Annex 10, Volume III, Part 1, 10.1 and 10.2.

11.1.2 Suitable telecommunications facilities shall be made available to permit meteorological watch offices to supply the required meteorological information to air traffic services and search and rescue services units in respect of the flight information regions, control areas and search and rescue regions for which those offices are responsible, and in particular to flight information centres, area control centres and rescue coordination centres and the associated aeronautical telecommunications stations.

11.1.3 Suitable telecommunications facilities shall be made available to permit world area forecast centres to supply the required world area forecast system products to CFO-NMEC, PME meteorological services and other users.

11.1.4 Telecommunications facilities between meteorological offices and, as necessary, aeronautical meteorological stations and aerodrome control towers or approach control units shall permit communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds.

11.1.5 *Telecommunications facilities between meteorological offices and flight information centres, area control centres, rescue coordination centres and aeronautical telecommunications stations should permit:*

- a) communications by direct speech, the speed with which the communications can be established being such that the required points may normally be contacted within approximately 15 seconds; and*
- b) printed communications, when a record is required by the recipients; the message transit time should not exceed 5 minutes.*

Note.— In 11.1.4 and 11.1.5, “approximately 15 seconds” refers to telephony communications involving switchboard operation and “5 minutes” refers to printed communications involving retransmission.

11.1.6 *The telecommunications facilities required in accordance with 11.1.4 and 11.1.5 should be supplemented, as and where necessary, by other forms of visual or audio communications, for example, closed-circuit television or separate information processing systems.*

11.1.7 *As agreed between PME and operators, provision should be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.*

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

11.1.9 *The telecommunications facilities used for the exchange of operational meteorological information should be the aeronautical fixed service.*

11.2 Use of aeronautical fixed service communications — meteorological bulletins in alphanumeric format

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

Note.— Meteorological bulletins containing operational meteorological information authorized for transmission via the aeronautical fixed service are listed in Annex 10, Volume II, Chapter 4, together with the relevant priorities and priority indicators.

11.3 Use of aeronautical fixed service communications — world area forecast system products

World area forecast system products in digital form should be transmitted using binary data communications techniques. The method and channels used for the dissemination of the products should be as determined by regional air navigation agreement.

11.4 Use of aeronautical mobile service communications

The content and format of meteorological information transmitted to aircraft and by aircraft shall be consistent with the provisions of this Regulation.

11.5 Use of aeronautical data link service — contents of D-VOLMET

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

Note.— The requirement to provide METAR and SPECI may be met by the data link-flight information service (D-FIS) application entitled “Data link-aerodrome routine meteorological report (D-METAR) service”; the requirement to provide TAF may be met by the D-FIS application entitled “Data link-aerodrome forecast (D-TAF) service”; and the requirement to provide SIGMET and AIRMET messages may be met by the D-FIS application entitled “Data link-SIGMET (D-SIGMET) service”. The details of these data link services are specified in the Manual of Air Traffic Services Data Link Applications (Doc 9694).

11.6 Use of aeronautical broadcasting service — contents of VOLMET broadcasts

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

11.6.2 Scheduled VOLMET broadcasts, normally on high frequencies (HF), shall contain current METAR and SPECI, together with trend forecasts where available and, where so determined by regional air navigation agreement, TAF and SIGMET.