
GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

TABLE OF CONTENTS

GACAR PART 179 - METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART A – GENERAL

§ 179.1 Applicability.	4
§ 179.3 Restrictions on MET Service Providers.	4
§ 179.5 Objectives of MET Services for Air Navigation.	4
§ 179.7 Notifications Required From Operators.	4
§ 179.9 Coordination Requirements.	5
§ 179.11 Regional Air Navigation Agreements.	6
§ 179.13 Applicability of the Standards of the International Civil Aviation Organization and the World Meteorological Organization.	6
§ 179.15 Human Factors.	6
§ 179.17 Site Requirements.	6
§ 179.19 Verification, Periodic Inspection, Testing and Calibration.	7
§ 179.20 Inspections.	7

SUBPART B – PERSONNEL

§ 179.21 Personnel Requirements.	8
§ 179.23 Meteorological Personnel Qualifications.	8
§ 179.25 Staffing Levels and Training.	9
§ 179.27 Human Performance.	9

SUBPART C – MANUAL REQUIREMENTS

§ 179.31 General.	11
§ 179.33 Manual Contents.	11

SUBPART D – WORLD AREA FORECAST SYSTEM AND AERODROME METEOROLOGICAL OFFICES

§ 179.41 Objective of the World Area Forecast System (WAFS).	13
§ 179.43 World Area Forecast Centers (W AFC).	13
§ 179.45 Aerodrome Meteorological Offices.	14
§ 179.47 Meteorological Watch Offices.	15
§ 179.49 Volcanic Ash Advisory Centers (VAAC).	16
§ 179.51 Tropical Cyclone Advisory Centers.	17

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART E – METEOROLOGICAL OBSERVATIONS AND REPORTS

§ 179.61 Aeronautical Meteorological Stations and Observations.	19
§ 179.63 Agreement Between the MET Service Provider and the ATS Service Provider.	20
§ 179.65 Routine Observations and Reports.	21
§ 179.67 Special Observations and Reports.	21
§ 179.69 Contents of Reports.	22
§ 179.71 Observing and Reporting Meteorological Elements.	22
§ 179.73 Reporting Meteorological Information from Automatic Observing Systems.	25
§ 179.75 Observations and Reports of Volcanic Activity.	26

SUBPART F – AIRCRAFT OBSERVATIONS AND REPORTS

§ 179.81 Relay of Air-Reports by ATS Units.	27
§ 179.83 Recording and Post-Flight Reporting of Aircraft Observations of Volcanic Activity.	27

SUBPART G – FORECASTS

§ 179.91 Interpretation and Use of Forecasts.	28
§ 179.93 Aerodrome Forecasts.	28
§ 179.95 Landing Forecasts.	29
§ 179.97 Forecasts for Takeoff.	29
§ 179.99 Area Forecasts for Low-Level Flights.	30

SUBPART H – SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

§ 179.111 SIGMET Information.	31
§ 179.113 AIRMET Information.	31
§ 179.115 Aerodrome Warnings.	32
§ 179.117 Wind Shear Warnings and Alerts.	32

SUBPART I – AERONAUTICAL CLIMATOLOGICAL INFORMATION

§ 179.121 General.	34
§ 179.123 Aerodrome Climatological Tables.	34
§ 179.125 Copies of Meteorological Observational Data.	34

SUBPART J – SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

§ 179.131 General.	35
-------------------------	----

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

§ 179.133 Briefing, Consultation and Display.	37
§ 179.135 Flight Documentation.	38
§ 179.137 Automated Pre-Flight Information Systems for Briefing, Consultation,.....	39
Flight Planning and Flight Documentation.	
§ 179.139 Information for Aircraft in Flight.	39

SUBPART K – INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

§ 179.151 Information for ATS Units.	40
§ 179.153 Information for SAR Units.	40
§ 179.155 Information for AIS Units.	40

SUBPART L – REQUIREMENTS FOR AND USE OF COMMUNICATIONS

§ 179.161 Requirements for Communications.	41
§ 179.163 Use of Aeronautical Fixed Service Communications – Meteorological.....	41
Bulletins in Alphanumeric Format.	
§ 179.165 Use of Aeronautical Fixed Service Communications – WAFS Products.	42
§ 179.167 Use of Aeronautical Mobile Service Communications.	42
§ 179.169 Use of Aeronautical Data Link Service – Contents of D-VOLMET.	42
§ 179.171 Use of Aeronautical Broadcasting Service – Contents of VOLMET.....	42
Broadcasts.	

SUBPART M – QUALITY ASSURANCE

§ 179.181 Quality Assurance System.	43
§ 179.183 Customer Forum.	44
§ 179.185 Users and Customer Feedback.	45
§ 179.187 Meteorological Information Check after Aircraft Accident or Serious.....	45
Incident.	
§ 179.189 Malfunctions and Erroneous Information.	45

SUBPART N – RECORDS AND REPORTS

§ 179.191 Document Retention.	47
§ 179.193 Promulgated Information Incident Reports.	47

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART A – GENERAL

§ 179.1 Applicability.

This part prescribes –

- (a) Rules governing the provision of meteorological (MET) services for air navigation in the Kingdom of Saudi Arabia (KSA) by a MET service provider that holds or is required to hold an Air Navigation Service Certificate (ANSC) under General Authority of Civil Aviation Regulation (GACAR) Part 170; and
- (b) Aircraft operators requiring meteorological service or changes in existing meteorological services.

§ 179.3 Restrictions on MET Service Providers.

- (a) Except as provided in GACAR § 170.1(d), no person may provide a MET service in the KSA unless the person complies with the provisions of this part and they have been certificated by the President under GACAR Part 170 to provide such service.
- (b) Except as provided in GACAR Part 170, each MET service provider must comply with the limitations and provisions of their certificate, operations specifications and their manual prepared under Subpart C.

§ 179.5 Objectives of MET Services for Air Navigation.

- (a) The objective of meteorological service for air navigation must be to contribute towards the safety, regularity and efficiency of air navigation.
- (b) Each MET service provider must achieve this objective by supplying the following users: operators, flight crew members, air traffic services units, search and rescue services units, aerodrome managements and others concerned with the conduct or development of air navigation, with the meteorological information necessary for the performance of their respective functions.
- (c) Close liaison must 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.

§ 179.7 Notifications Required From Operators.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

- (a) An operator requiring meteorological service or changes in existing meteorological service must notify, sufficiently in advance, the MET service provider(s) concerned. The minimum amount of advance notice required must be as agreed between MET service provider(s) and the operator.
- (b) MET service provider(s) must be notified by the operator requiring service when:
- (1) New routes or new types of operations are planned;
 - (2) Changes of a lasting character are to be made in scheduled operations; and
 - (3) Other changes, affecting the provision of meteorological service, are planned.

Such information must contain all details necessary for the planning of appropriate arrangements by the MET service provider.

§ 179.9 Coordination Requirements.

Each MET service provider must establish systems and procedures for ensuring coordination between each of the following agencies—

- (a) General Authority of Civil Aviation (GACA) Safety, Security & Air Transport (SS&AT) Sector;
- (b) GACA Domestic Airports Sector;
- (c) Reserved;
- (d) Any other MET service provider authorized under this part;
- (e) Each aeronautical telecommunication service provider operating in accordance with General Authority of Civil Aviation Regulation (GACAR) Part 173;
- (f) Each aeronautical information service (AIS) provider operating in accordance with GACAR Part 173;
- (g) Each air traffic service provider (ATS) operating in accordance with GACAR Part 171;
- (h) Each search and rescue (SAR) authority;
- (i) Aircraft operators;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(j) The Saudi Arabian Armed Forces; and

(k) Each domestic and international aerodrome operator in the KSA.

§ 179.11 Regional Air Navigation Agreements.

Each MET service provider must coordinate with the GACA SS&AT when interacting with foreign States or foreign MET providers and when there are implications for Regional Air Navigation Agreements for which the KSA is a party.

§ 179.13 Applicability of the Standards of the International Civil Aviation Organization and the World Meteorological Organization.

Each MET service provider must provide services in full compliance with the applicable standards of this part and of those of the International Civil Aviation Organization (ICAO) and the World Meteorological Organization (WMO). Specifically, the standards as prescribed in ICAO Annex 3 and WMO Doc. 258 - Guidelines for the education and training of personnel in meteorology and operational hydrology — Volume I: Meteorology, apply to MET service providers under this part. In cases where the ICAO and WMO standards are incompatible with the standards prescribed in this part, this part must prevail.

§ 179.15 Human Factors.

Each MET service provider must ensure that the meteorological information supplied to the users is consistent with Human Factors principles and must be in forms which require a minimum of interpretation by these users.

§179.17 Site Requirements.

Each MET service provider must ensure that:

(a) Each of its aerodrome meteorological offices and facilities is:

(1) Sited and configured in accordance with security measures designed to prevent unlawful or accidental interference; and

(2) Provided with suitable power supplies and means to ensure appropriate continuity of service.

(b) Each remote weather sensing facility is installed and maintained in a technically appropriate

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

position to ensure that the facility provides an accurate representation of the local meteorological conditions.

§179.19 Verification, Periodic Inspection, Testing and Calibration.

(a) Each MET service provider must establish procedures for:

- (1) Their own routine verification of meteorological information obtained and provided by the MET service provider;
- (2) Their own periodic inspection of each of their aerodrome meteorological offices; and
- (3) Their own periodic inspection, testing and calibration of each of their facilities.

(b) The procedures must ensure that:

- (1) The systems required for the routine verification of meteorological information have the capability and integrity necessary for verifying the meteorological information;
- (2) Appropriate inspection equipment and systems are available to personnel for the inspection of each aerodrome meteorological office;
- (3) Appropriate inspection, measuring and test equipment and systems are available to personnel for the inspection, testing and calibration of each facility;
- (4) The inspection, measuring and test equipment and systems have the precision and accuracy necessary for the inspections, measurements and tests being carried out; and
- (5) All meteorological sensing facilities are calibrated and configured so that the environmental sensors fitted or incorporated yield, as far as possible, reliable, accurate and representative meteorological information.

§ 179.20 Inspections.

Each MET service provider must allow the President to make any inspections, at any time, in order to allow the President to determine compliance with this part.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART B – PERSONNEL

§ 179.21 Personnel Requirements.

Each MET service provider must employ, contract, or otherwise engage—

(a) A senior person, identified for the purposes of this part as the Director of meteorological services, who—

- (1) Has the authority within the organization to ensure that all activities undertaken by the organization can be financed and carried out to meet applicable operational requirements; and
- (2) Is responsible for ensuring that the organization complies with the requirements of this Part.

(b) A senior person or persons responsible to the Director of meteorological services for ensuring that the organization complies with its manual; and

(c) Sufficient technical personnel to inspect, supervise, and maintain the facilities listed in the manual.

§ 179.23 Meteorological Personnel Qualifications.

(a) Each MET service provider must ensure that each person assigned duties as meteorological personnel is competent and holds appropriate qualifications to perform the duties which they are assigned.

(b) Each MET service provider must ensure that each person assigned duties as meteorological personnel has been:

- (1) Appropriately trained; and
- (2) Assessed as competent through a formal process by a person who is qualified.

(c) Each MET service provider must give each person assigned duties as meteorological personnel a certificate that:

- (1) Names the meteorological personnel;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(2) Describes the functions that the person assigned duties as meteorological personnel is authorized to perform; and

(3) States the period during which the certificate is effective and valid.

(d) Each MET service provider must develop a periodic and comprehensive recurrent training program to ensure that each person assigned duties as meteorological personnel maintains the appropriate level of qualification. The established period must not exceed 12 months. (e) Each MET service provider must develop and publish job descriptions for all technical staff assigned to provide MET services.

§ 179.25 Staffing Levels and Training.

Each MET service provider must –

(a) Establish arrangements that define the person responsible and the process to be followed to ensure an adequate number of suitably trained and rated staff are available in respect of MET services.

(b) Define the method by which staffing levels are determined in relation to the MET services to be provided.

(c) Establish arrangements that define the management responsibilities and process for ensuring adequate staff supervision. Arrangements must include the mechanisms that ensure only trained and competent staff undertakes the provision of MET services.

§ 179.27 Human Performance.

Each MET service provider must ensure that Human Factors and performance are applied in the provision of MET services. The following activities must be conducted:

(a) Mandating Human Factors input to specific tasks/projects;

(b) Raising awareness of Human Factors and initiating Human Factors training across the all concerned departments in an appropriate manner;

(c) Keeping abreast of developments within Human Factors and applying this knowledge as appropriate.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(d) Considering Human Factors aspects in incident investigation.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART C – MANUAL REQUIREMENTS

§ 179.31 General.

This subpart prescribes requirements for each MET service provider to prepare and maintain a manual.

§ 179.33 Manual Contents.

- (a) Each MET service provider must provide the President with a manual containing—
- (1) A statement signed by the Director of meteorological services, on behalf of the organization confirming that—
 - (i) The manual defines the organization and demonstrates its means and methods for ensuring ongoing compliance with this Part; and
 - (ii) The manual, and all associated manuals, operating, and maintenance instructions, must be complied with by the organization’s personnel at all times.
 - (2) An organization chart showing lines of responsibility of the senior persons;
 - (3) A summary of the organization’s staffing structure at each location listed under paragraph (a)(4); and
 - (4) A list of each type of MET facility to be operated under the authority of the MET service provider; and
 - (5) A summary of the scope of activities at each location where the organization’s personnel are based for the purpose of providing MET services under paragraph (a)(4); and
 - (6) The detailed procedures required under GACAR § 179.19 for verification, periodic inspection, testing and calibration, GACAR § 179.185 for users and customer feedback and GACAR § 179.181 regarding the quality assurance system; and
 - (7) Detailed procedures to control, amend, and distribute the manual.
- (b) Each manual, and all of its revisions, must be acceptable to the President.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(c) Each MET service provider must—

- (1) Ensure that its manual is amended, as required, to remain a current description of the MET service provider’s organization, services, and facilities; and
- (2) Ensure that any amendments made to its manual meet the applicable requirements of this Part; and
- (3) Comply with the manual amendment procedure contained in its manual; and
- (4) Provide the President with a copy of each amendment to its manual, immediately after the amendment is incorporated into the manual; and
- (5) Make such amendments to its manual as the President may consider necessary in the interests of aviation safety.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART D – WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 3 of Annex 3 to the Convention of International Civil Aviation.

§ 179.41 Objective of the World Area Forecast System (WAFS).

The objective of the world area forecast system must be to supply meteorological authorities and other users with global aeronautical meteorological en-route forecasts in digital form. This objective must 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.

§ 179.43 World Area Forecast Centers (WAFC).

Authorized MET service provider having accepted the responsibility for providing a WAFC within the framework of the world area forecast system, must arrange -

(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;
- (5) Direction, speed and flight level of maximum wind;
- (6) Cumulonimbus clouds;
- (7) Icing; and
- (8) Turbulence.

(b) To prepare global forecasts of significant weather (SIGWX) phenomena;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

- (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 center (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.
- (f) To ensure, in case of interruption of the operation of a WAFC, its functions are carried out by another 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.

§ 179.45 Aerodrome Meteorological Offices.

- (a) Each MET service provider must have aerodrome meteorological offices which must be adequate for the provision of the meteorological service required to satisfy the needs of air navigation.
- (b) An aerodrome meteorological office must carry out all or some of the following functions as necessary to meet the needs of flight operations at the aerodrome:
 - (1) Prepare and/or obtain forecasts and other relevant information for flights with which it is concerned; the extent of its responsibilities to prepare forecasts must be related to the local availability and use of en-route and aerodrome forecast material received from other offices;
 - (2) Prepare and/or obtain forecasts of local meteorological conditions;
 - (3) Maintain a continuous survey of meteorological conditions over the aerodromes for which it is designated to prepare forecasts;
 - (4) Provide briefing, consultation and flight documentation to flight crew members and/or other flight operations personnel;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

- (5) Supply other meteorological information to aeronautical users;
 - (6) Display the available meteorological information;
 - (7) Exchange meteorological information with other aerodrome meteorological offices; and
 - (8) 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 provider and air traffic service provider.
- (c) The aerodrome meteorological offices at which flight documentation is required, as well as the areas to be covered, will be determined by regional air navigation agreement.
- (d) The aerodromes for which landing forecasts are required will be determined by regional air navigation agreement.
- (e) For aerodromes without an aerodrome meteorological office located at the aerodrome:
- (1) The MET service provider must designate one or more aerodrome meteorological offices to supply meteorological information as required; and
 - (2) The MET service provider must establish means by which such information can be supplied to the aerodromes concerned.

§ 179.47 Meteorological Watch Offices.

- (a) Each MET service provider must establish one or more meteorological watch offices within the flight information regions or control areas for which they have been assigned MET responsibilities by the President.
- (b) Each meteorological watch office must:
- (1) Maintain watch over meteorological conditions affecting flight operations within its area of responsibility;
 - (2) Prepare SIGMET and other information relating to its area of responsibility;
 - (3) Supply SIGMET information and, as required, other meteorological information to

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

associated air traffic services units;

(4) Disseminate SIGMET information;

(5) When required by regional air navigation agreements:

(i) Prepare AIRMET information related to its area of responsibility;

(ii) Supply AIRMET information to associated air traffic services units; and

(iii) Disseminate AIRMET information;

(c) 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 MET and the ATS service provider, and to its associated VAAC as determined by regional air navigation agreement; and

(d) Supply information received concerning the 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 MET and the ATS service provider, and to the AIS provider, as agreed between the MET and the AIS service provider. The information must comprise location, date and time of the release, and forecast trajectories of the radioactive materials.

(e) Meteorological watch must 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.

§ 179.49 Volcanic Ash Advisory Centers (VAAC).

(a) Each MET service provider, having accepted the responsibility for providing a VAAC within the framework of the international airways volcano watch, must arrange 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 to:

(1) Monitor relevant geostationary and polar-orbiting satellite data to detect the existence and extent of volcanic ash in the atmosphere in the area concerned;

(2) Activate the volcanic ash numerical trajectory/dispersion model in order to forecast the movement of any ash —cloud which has been detected or reported;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

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

(3) Issue advisory information regarding the extent and forecast movement of the volcanic ash —cloud to:

(i) Meteorological watch offices, area control centers and flight information centers serving flight information regions in its area of responsibility which may be affected;

(ii) Other VAACs whose areas of responsibility may be affected;

(iii) World area forecast centers, international OPMET databanks, international NOTAM offices, and centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems; and

(iv) Airlines requiring the advisory information through the AFTN address provided specifically for this purpose.

(4) Issue updated advisory information to the meteorological watch offices, area control centers, flight information centers 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.

(b) Volcanic ash advisory centers must maintain a 24-hour watch.

(c) In case of interruption of the operation of a VAAC, authorized MET service providers must ensure its functions are carried out by another VAAC or another meteorological center.

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) (ICAO Doc. 9766).

§ 179.51 Tropical Cyclone Advisory Centers.

Each MET service provider, having accepted the responsibility for providing tropical cyclone advisory centers (TCAC), must arrange to:

(a) Monitor the development of tropical cyclones in its area of responsibility, using geostationary

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

and polar orbiting satellite data, radar data and other meteorological information;

(b) Issue advisory information concerning the position of the cyclone center, its direction and speed of movement, central pressure and maximum surface wind near the center; 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 centers, international OPMET databanks, and centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems.

(c) Issue updated advisory information to meteorological watch offices for each tropical cyclone, as necessary, but at least every six hours.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART E – METEOROLOGICAL OBSERVATIONS AND REPORTS

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 4 of Annex 3 to the Convention of International Civil Aviation.

§ 179.61 Aeronautical Meteorological Stations and Observations.

(a) Each MET service provider must establish, at aerodromes in the KSA, 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 the MET service provider to ensure the compliance of meteorological service for air navigation with the provisions of this part.

(b) Each MET service provider must establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of rotorcraft operations to offshore structures, if required by regional air navigation agreement.

(c) Aeronautical meteorological stations must make routine observations at fixed intervals. At aerodromes, the routine observations must 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.

(d) Each MET service provider must 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.

(e) 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 must be installed to support approach and landing and takeoff operations. These devices must be integrated automatic systems for acquisition, processing, dissemination and display in real time of the meteorological parameters affecting landing and takeoff operations. The design of integrated automatic systems must observe Human Factors principles and include back-up procedures.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

- (f) Unless otherwise approved by the President, 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 must be installed to support approach and landing and takeoff operations.
- (g) Where an integrated semi-automatic system is used for the dissemination/display of meteorological information, it must be capable of accepting the manual insertion of data covering those meteorological elements which cannot be observed by automatic means.
- (h) The observations must 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.
- (i) 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 must be understood by the recipient to be the best approximation to the actual conditions at the time of observation.

§ 179.63 Agreement Between the MET Service Provider and the ATS Service Provider.

An agreement between the MET service provider and the ATS service provider must be 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.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

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

§ 179.65 Routine Observations and Reports.

(a) At aerodromes, routine observations must be made throughout the 24 hours each day, except as otherwise agreed between the MET service provider, the ATS service provider and the operators concerned. Such observations must 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 must be made as determined by the MET service provider taking into account the requirements of air traffic services units and aircraft operations.

(b) Reports of routine observations must be issued as:

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

(c) At aerodromes that are not operational throughout 24 hours in accordance with (a), METAR must be issued prior to the aerodrome resuming operations in accordance with regional air navigation agreement.

§ 179.67 Special Observations and Reports.

(a) A list of criteria for special observations must be established by the MET service provider, the ATS service provider, operators and others concerned.

(b) Reports of special observations must be issued as:

- (1) Local special reports, only for dissemination at the aerodrome of origin (intended for arriving and departing aircraft); and
- (2) 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.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(c) At aerodromes that are not operational throughout 24 hours, following the resumption of the issuance of METAR, SPECI must be issued, as necessary.

§ 179.69 Contents of Reports.

(a) Local routine and special reports and METAR and SPECI must contain the following elements in the order indicated:

- (1) Identification of the type of report;
- (2) Location indicator;
- (3) Time of the observation;
- (4) Identification of an automated or missing report, when applicable;
- (5) Surface wind direction and speed;
- (6) Visibility;
- (7) Runway visual range, when applicable;
- (8) Present weather;
- (9) Cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or, where measured, vertical visibility;
- (10) Air temperature and dew-point temperature; and
- (11) QNH and, when applicable, QFE (QFE included only in local routine and special reports).

(b) In addition to elements listed under paragraph (a), local routine and special reports and METAR and SPECI should contain supplementary information to be placed after element (a)(10).

(c) Optional elements included under supplementary information must be included in METAR and SPECI in accordance with regional air navigation agreement.

§ 179.71 Observing and Reporting Meteorological Elements.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(a) *Surface wind.*

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

(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.

(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.

(b) *Visibility.*

(1) The visibility must be measured or observed, and reported in meters or kilometers.

(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.

(3) For METAR and SPECI, the visibility observations should be representative of the aerodrome.

(c) *Runway visual range.*

(1) Runway visual range as must be assessed on all runways intended for Category II and III instrument approach and landing operations.

(2) Runway visual range must be assessed on all runways intended for use during periods of reduced visibility, including:

(i) Precision approach runways intended for Category I instrument approach and landing operations; and

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(ii) Runways used for takeoff and having high-intensity edge lights and/or center line lights.

(3) The runway visual range, assessed in accordance with (c)(2), must be reported in meters throughout periods when either the visibility or the runway visual range is less than 1 500 m

(4) Runway visual range assessments must be representative of:

(i) The touchdown zone of the runway intended for non-precision or Category I instrument approach and landing operations;

(ii) The touchdown zone and the mid-point of the runway intended for Category II instrument approach and landing operations; and

(iii) The touchdown zone, the mid-point and stop-end of the runway intended for Category III instrument approach and landing operations.

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

(d) *Present weather.*

(1) The present weather occurring at the aerodrome and/or its vicinity must be observed and reported as necessary. The following present weather phenomena must be identified, as a minimum: rain, drizzle, snow and freezing precipitation (including intensity thereof), haze, mist, fog, freezing fog and thunderstorms (including thunderstorms in the vicinity).

(2) For local routine and special reports, the present weather information should be representative of conditions at the aerodrome.

(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.

(e) *Clouds.*

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(1) Cloud amount, cloud type and height of cloud base must be observed and reported as necessary to describe the clouds of operational significance. When the sky is obscured, vertical visibility must 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 must be reported in meters (or feet).

(2) Cloud observations for local routine and special reports should be representative of the runway threshold(s) in use.

(3) Cloud observations for METAR and SPECI should be representative of the aerodrome and its vicinity.

(f) *Air temperature and dew-point temperature.*

(1) The air temperature and the dew-point temperature must be measured and reported in degrees Celsius.

(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.

(g) *Atmospheric pressure.* The atmospheric pressure must be measured, and QNH and QFE values must be computed and reported in hectopascals.

(h) *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.

§ 179.73 Reporting Meteorological Information from Automatic Observing Systems.

(a) METAR and SPECI from automatic observing systems must be used, to the maximum extent practicable, during non-operational hours of the aerodrome, and during operational hours of the aerodrome. METAR and SPECI from automatic observing systems must be approved by the President.

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

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(b) METAR and SPECI from automatic observing systems must be identified with the word —AUTO.

§ 179.75 Observations and Reports of Volcanic Activity.

The occurrence of pre-eruption volcanic activity, volcanic eruptions and volcanic ash cloud must be reported without delay to the associated air traffic services unit, aeronautical information services unit and meteorological watch office. The report must 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.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART F – AIRCRAFT OBSERVATIONS AND REPORTS

§ 179.81 Relay of Air-Reports by ATS Units.

Each MET service provider must make arrangements with ATS providers to ensure that, on receipt by the ATS units of:

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

§ 179.83 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 must be recorded on the special air-report of volcanic activity form. A copy of the form must be included with the flight documentation provided to flights operating on routes which, in the opinion of the MET service provider, could be affected by volcanic ash clouds.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART G – FORECASTS

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 5 of Annex 3 to the Convention of International Civil Aviation.

§ 179.91 Interpretation and Use of Forecasts.

The issue of a new forecast by an aerodrome meteorology office, such as a routine aerodrome forecast, must 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.

§ 179.93 Aerodrome Forecasts.

- (a) Authorized MET service providers must prepare aerodrome forecasts as prescribed in this subpart.
- (b) An aerodrome forecast must be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period.
- (c) Aerodrome forecasts and amendments thereto must be issued as TAF and include the following information in the order indicated:
- (1) Identification of the type of forecast;
 - (2) Location indicator;
 - (3) Time of issue of forecast;
 - (4) Identification of a missing forecast, when applicable;
 - (5) Date and period of validity of forecast;
 - (6) Identification of a cancelled forecast, when applicable;
 - (7) Surface wind;
 - (8) Visibility;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(9) Weather;

(10) Cloud; and

(11) Expected significant changes to one or more of these elements during the period of validity.

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

(d) Authorized MET service providers preparing TAF must keep the forecasts under continuous review and, when necessary, must issue amendments promptly. The length of the forecast messages and the number of changes indicated in the forecast must be kept to a minimum.

(e) TAF that cannot be kept under continuous review must be cancelled.

(f) 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.

(g) When issuing TAF, aerodrome meteorological offices must ensure that not more than one TAF is valid at an aerodrome at any given time.

§ 179.95 Landing Forecasts.

(a) Authorized MET service providers must prepare a landing forecast; such forecasts are intended to meet the requirements of local users and of aircraft within about one hour's flying time from the aerodrome.

(b) Landing forecasts must be prepared in the form of a trend forecast.

(c) A trend forecast must 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 METAR or SPECI. The period of validity of a trend forecast must be 2 hours from the time of the report which forms part of the landing forecast.

§ 179.97 Forecasts for Takeoff.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

- (a) Authorized MET service providers must prepare a takeoff forecast if required by agreement between the MET service provider and operators.
- (b) The forecast for takeoff must 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.
- (c) A forecast for takeoff should be supplied to operators and flight crew members on request within the 3 hours before the expected time of departure.
- (d) Aerodrome meteorological offices preparing forecasts for takeoff must keep the forecasts under continuous review and, when necessary, issue amendments promptly.

§ 179.99 Area Forecasts for Low-Level Flights.

- (a) 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 must be determined by the MET service provider in consultation with the users.
- (b) When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with (a), area forecasts for such operations must be prepared in a format agreed upon between the Meteorological authorities concern. When abbreviated plain language is used, the forecast must be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, the forecast must be prepared as a combination of forecasts of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts must 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 must 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.
- (c) Area forecasts for low-level flights prepared in support of the issuance of AIRMET information must be issued every 6 hours for a period of validity of 6 hours and transmitted to meteorological watch offices and/or aerodrome meteorological offices concerned not later than one hour prior to the beginning of their validity period.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART H – SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 6 of Annex 3 to the Convention of International Civil Aviation.

§ 179.111 SIGMET Information.

(a) SIGMET information must be issued by meteorological watch office and must 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.

(b) SIGMET information must be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

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

(d) SIGMET messages concerning volcanic ash cloud and tropical cyclones must be based on advisory information provided by VAACs and TCACs, respectively.

(e) Each MET service provider must ensure close coordination is maintained between meteorological watch office and the associated area control center/flight information center to ensure that information on volcanic ash included in SIGMET and NOTAM messages is consistent.

(f) SIGMET messages must 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 must 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 must be updated at least every 6 hours.

§ 179.113 AIRMET Information.

(a) AIRMET information must be issued by 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 must give a concise description in abbreviated plain

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

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 subpart G and which may affect the safety of low-level flights, and of the development of those phenomena in time and space.

(b) AIRMET information must be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

(c) The period of validity of an AIRMET message must be not more than 4 hours.

§ 179.115 Aerodrome Warnings.

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

(b) Aerodrome warnings must be cancelled when the conditions are no longer occurring and/or no longer expected to occur at the aerodrome.

§ 179.117 Wind Shear Warnings and Alerts.

(a) Wind shear warnings must be prepared by the aerodrome meteorological office for aerodromes where wind shear is considered a factor, in accordance with local arrangements with the ATS unit and operators concerned.

(b) Wind shear warnings must give concise information on the observed or expected existence of wind shear which could adversely affect aircraft on the approach path or takeoff 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 takeoff 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) must not be considered restrictive.

(c) Wind shear warnings for arriving aircraft and/or departing aircraft must 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 must be defined locally for each aerodrome, as agreed between the MET service provider, the ATS service provider and the operators concerned.

(d) At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

sensing or detection equipment, wind shear alerts generated by these systems must be issued. Wind shear alerts must 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 takeoff path and aircraft on the runway during the landing roll or takeoff run.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART I – AERONAUTICAL CLIMATOLOGICAL INFORMATION

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 7 of Annex 3 to the Convention of International Civil Aviation.

§ 179.121 General.

(a) 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.

(b) Aeronautical climatological information required for the planning of flight operations must be prepared in the form of aerodrome climatological tables and aerodrome climatological summaries. Such information must be supplied to aeronautical users as agreed between the MET service provider and those users.

(c) Aeronautical climatological information must normally be based on observations made over a period of at least five years and the period must be indicated in the information supplied.

§ 179.123 Aerodrome Climatological Tables.

Each MET service provider must 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 the KSA; and

(b) To make available such climatological tables to an aeronautical user within a time period as agreed between MET service provider and that user.

§ 179.125 Copies of Meteorological Observational Data.

Each MET service provider, on request and to the extent practicable, must make available to operators and to others concerned with the application of meteorology to air navigation, meteorological observational data required for research, investigation or operational analysis.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART J – SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 8 of Annex 3 to the Convention of International Civil Aviation.

§ 179.131 General.

(a) Each MET service provider must supply meteorological information to operators and flight crew members for:

- (1) Pre-flight planning by operators;
- (2) In-flight re-planning by operators using centralized operational control of flight operations;
- (3) Use by flight crew members before departure; and
- (4) Aircraft in flight.

(b) Meteorological information supplied to operators and flight crew members must cover the flight in respect of time, altitude and geographical extent. Accordingly, the information must relate to appropriate fixed times, or periods of time, and must 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.

(c) Meteorological information supplied to operators and flight crew members must be up to date and include the following information, as established by the MET service provider in consultation with operators concerned:

- (1) Forecasts of-
 - (i) Upper wind and upper-air temperature;
 - (ii) Upper-air humidity;
 - (iii) Geopotential altitude of flight levels;
 - (iv) Flight level and temperature of tropopause;

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(v) Direction, speed and flight level of maximum wind; and

(vi) 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.

(2) 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 takeoff, en-route and destination alternate aerodromes;

(3) TAF or amended TAF for the aerodromes of departure and intended landing, and for takeoff, en-route and destination alternate aerodromes;

(4) Forecasts for takeoff;

(5) 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.

(6) Volcanic ash and tropical cyclone advisory information relevant to the whole route;

(7) 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;

(8) Aerodrome warnings for the local aerodrome;

(9) Meteorological satellite images; and

(10) Ground-based weather radar information.

(d) Forecasts listed under (c)(1) must 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 the MET service provider and the operator concerned.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(e) When forecasts are identified as being originated by the WAFCs, no modifications must be made to their meteorological content.

(f) Charts generated from the digital forecasts provided by the WAFCs must be made available, as required by operators, for fixed areas of coverage as shown in Appendix 8 of Annex 3 to the Convention of International Civil Aviation, Figures A8-1, A8-2 and A8-3.

(g) When forecasts of upper wind and upper-air temperature listed under (c)(1)(i) are supplied in chart form, they must be fixed time prognostic charts for flight levels as specified in Appendix 2 of Annex 3 to the Convention of International Civil Aviation, paragraph 1.2.2 a). When forecasts of SIGWX phenomena listed under (c)(1)(vi) are supplied in chart form, they must be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified in Appendix 2 of Annex 3 to the Convention of International Civil Aviation, paragraph 1.3.2 and Appendix 5 of Annex 3 to the Convention of International Civil Aviation, paragraph 4.3.2.

(h) 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 must be supplied as soon as they become available, but not later than 3 hours before departure. Other meteorological information requested for preflight planning and in-flight re-planning by the operator must be supplied as soon as is practicable.

(i) When necessary, each MET service provider providing service for operators and flight crew members must initiate coordinating action with the meteorological authorities of other States with a view to obtaining from them the reports and/or forecasts required.

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

§ 179.133 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 GACAR § 179.137.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(a) Briefing and/or consultation must be provided, on request, to flight crew members and/or other flight operations personnel. Its purpose must 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 the MET service provider and the operator, in lieu of flight documentation.

(b) Meteorological information used for briefing, consultation and display must include any or all of the information listed in GACAR § 179.131(c).

(c) If the aerodrome 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 must be drawn to the divergence. The portion of the briefing dealing with the divergence must be recorded at the time of briefing and this record must be made available to the operator.

(d) The required briefing, consultation, display and/or flight documentation must normally be provided by the aerodrome 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 must be as agreed upon between the MET service provider and the operator concerned. In exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome must provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary.

§ 179.135 Flight Documentation.

Note.— The requirements for the use of automated pre-flight information systems in providing flight documentation are given in GACAR § 179.137.

(a) Flight documentation to be made available must comprise information listed under GACAR § 179.131(c)(I and vi), (c)(2), (c)(3), (c)(5) and, if appropriate, (c)(6). However, when agreed between the MET service provider and operator concerned, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, must be limited to the information operationally needed, but in all cases the flight documentation must at least comprise information on GACAR § 179.131(c)(2), (c)(3), (c)(5) and, if appropriate, (c)(6).

(b) 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

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

re-planning, the operator must be advised immediately and, if practicable, be supplied with the revised information as agreed between the operator and the aerodrome meteorological office concerned.

(c) In cases where a need for amendment arises after the flight documentation has been supplied, and before takeoff of the aircraft, the aerodrome meteorological office must issue the necessary amendment or updated information to the operator or to the local air traffic services unit, for transmission to the aircraft.

§ 179.137 Automated Pre-Flight Information Systems for Briefing, Consultation, Flight Planning and Flight Documentation.

(a) Where the MET service provider 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 must comply with the relevant provisions in GACAR §§ 179.131 to 179.135 inclusive.

(b) 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, the MET service provider must remain responsible for the quality control and quality management of meteorological information provided by means of such systems.

Note.— The responsibilities relating to aeronautical information services information is addressed under GACAR Part 175.

§ 179.139 Information for Aircraft in Flight.

(a) Meteorological information for use by aircraft in flight must be supplied by an aerodrome meteorological office or meteorological watch 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 must be supplied on request, as agreed between the MET service provider and the operator concerned.

(b) Meteorological information for use by aircraft in flight must be supplied to air traffic services units in accordance with the specifications of Subpart K.

(c) Meteorological information must be supplied through D-VOLMET or VOLMET broadcasts in accordance with the specifications of Subpart L.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART K – INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

§ 179.151 Information for ATS Units.

- (a) Each MET service provider must designate an aerodrome meteorological office or meteorological watch office to be associated with each air traffic services unit. The associated aerodrome meteorological office or meteorological watch office must, 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.
- (b) The associated meteorological office for an aerodrome control tower or approach control unit must be an aerodrome meteorological office.
- (c) The associated meteorological office for a flight information center or an area control center must be a meteorological watch office.
- (d) Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or meteorological watch office to be shared between two or more aerodrome meteorological offices or meteorological watch offices, the division of responsibility must be determined by the MET service provider in consultation with the ATS provider.
- (e) Any meteorological information requested by an air traffic services unit in connection with an aircraft emergency must be supplied as rapidly as possible.

§ 179.153 Information for SAR Units.

Each MET service provider must supply SAR services units with the meteorological information they require in a form established by mutual agreement. For that purpose, each MET service provider must maintain liaison with the search and rescue services units throughout a search and rescue operation.

§ 179.155 Information for AIS Units.

Each MET service provider must supply up- to-date meteorological information to relevant AIS units, as necessary, for the conduct of their functions.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART L – REQUIREMENTS FOR AND USE OF COMMUNICATIONS

Note.— Technical specifications and detailed criteria related to this subpart are contained in Appendix 10 of Annex 3 to the Convention of International Civil Aviation.

§ 179.161 Requirements for Communications.

(a) Suitable telecommunications facilities must 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.

(b) Suitable telecommunications facilities must 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 centers, area control centers and rescue coordination centers and the associated aeronautical telecommunications stations.

(c) Suitable telecommunications facilities must be made available to permit world area forecast centers to supply the required world area forecast system products to the MET service provider and other users.

(d) Telecommunications facilities between aerodrome meteorological offices and, as necessary, aeronautical meteorological stations and aerodrome control towers or approach control units must 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.

(e) Suitable telecommunications facilities must be made available to permit aerodrome meteorological offices to exchange operational meteorological information with other aerodrome meteorological offices.

§ 179.163 Use of Aeronautical Fixed Service Communications – Meteorological Bulletins in Alphanumeric Format.

Meteorological bulletins containing operational meteorological information to be transmitted via

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

the aeronautical fixed service must be originated by the appropriate aerodrome meteorological office or aeronautical meteorological station.

§ 179.165 Use of Aeronautical Fixed Service Communications – WAFS Products.

World area forecast system products in digital form must be transmitted as determined by regional air navigation agreement.

§ 179.167 Use of Aeronautical Mobile Service Communications.

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

§ 179.169 Use of Aeronautical Data Link Service – Contents of D-VOLMET.

D-VOLMET must 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.

§ 179.171 Use of Aeronautical Broadcasting Service – Contents of VOLMET Broadcasts.

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

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

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART M – QUALITY ASSURANCE

Note.— Technical guidance criteria related to this subpart are contained in ICAO Doc. 9873, Manual on the Quality Management System for the Provision of Meteorological Service for International Air Navigation.

§ 179.181 Quality Assurance System.

- (a) Each MET service provider must establish and maintain a properly organized quality assurance system containing procedures, processes and resources necessary to implement quality management for all MET services provided under this part.
- (b) The quality system must be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and certified by an approved organization.
- (c) Within the context of the MET service provider's quality system, the skills and knowledge required for each function must be identified and personnel assigned to perform those functions must be appropriately trained.
- (d) Each MET service provider must ensure that personnel possess the skills and competencies required to perform specific assigned functions, and appropriate records must be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments must be established that require personnel to demonstrate the required skills and competencies. Periodic assessments of personnel must be used as a means to detect and correct shortfalls.
- (e) The quality system must provide the users with assurance 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 must not be supplied to the users unless it is validated with the originator.
- (f) In regard to the exchange of meteorological information for operational purposes, the quality system must include verification and validation procedures and resources for monitoring adherence to the prescribed transmission schedules for individual messages and/or bulletins

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

required to be exchanged, and the times of their filing for transmission. The quality system must be capable of detecting excessive transit times of messages and bulletins received.

(g) Demonstration of compliance of the quality system applied must be by audit. If nonconformity of the system is identified, action should be initiated to determine and correct the cause. All audit observations must be evidenced and properly documented.

(h) Within the quality assurance system, if nonconformity is identified, initiating action to correct its cause must be determined and taken as follows -

(1) The procedure required for corrective action must specify how—

(i) To correct an existing quality problem; and

(ii) To follow up a corrective action to ensure the action is effective; and

(iii) To amend any procedure required under this Part as a result of a corrective action;
and

(iv) Management will measure the effectiveness of any corrective action taken.

(2) The procedure required for preventive action must specify how—

(i) To correct a potential quality problem; and

(ii) To follow-up a preventive action to ensure the action is effective; and

(iii) To amend any procedure required under this Part as a result of a preventive action;
and

(iv) Management will measure the effectiveness of any preventive action taken.

Note.— The International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance program. Guidance on the establishment and implementation of a quality system is given in the Manual on the Quality Management System for the Provision of Meteorological Service to International Air Navigation (ICAO Doc. 9873).

§ 179.183 Customer Forum.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

Each MET service provider must hold an annual forum, consultation or survey with its customers in order to determine the quality of the service provided and to ascertain whether or not it meets their requirements. The GACA S&AT must be informed, in advance, and may attend any meetings as an observer.

§ 179.185 Users and Customer Feedback.

Each MET service provider must address and respond to all customer feedback. Customers will have the right to address feedback to the President on issues when an issue raised remains open or not resolved.

§ 179.187 Meteorological Information Check after Aircraft Accident or Serious Incident.

(a) Each MET service provider must establish procedures for checking the adequacy, accuracy and timeliness of any of their meteorological information that may have been used by an aircraft or an air traffic service involved in an aircraft accident or serious incident.

(b) The procedures must ensure that:

(1) The checks are carried out as soon as practicable after notification to the MET service provider's organization of such an aircraft accident or serious incident; and

(2) Copies of the meteorological information are kept in a secure place for possible use by any subsequent investigation.

§ 179.189 Malfunctions and Erroneous Information.

Each MET service provider must:

(a) Identify, record, investigate and rectify any report of erroneous meteorological information;

(b) Identify, record, notify, investigate and rectify any detected malfunction in the facilities and meteorological services that may result in the supply of erroneous meteorological information;

(c) Notify without delay all users that have received the erroneous meteorological information; and

(d) Submit reports to the President as prescribed under GACAR § 179.193; and

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

(e) Notify the President, within 12 hours, of those facility malfunctions that cannot be remedied within 72 hours.

GACAR PART 179 – METEOROLOGY SERVICES FOR AIR NAVIGATION

SUBPART N – RECORDS AND REPORTS

§ 179.191 Document Retention.

(a) Each MET service provider must 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 must be made available to the President and the SAAIB, on request, for inquiries or investigations and, for these purposes, must be retained until the inquiry or investigation is completed.

(b) Each MET service provider must retain qualification and training records for at least the last three years for all active meteorological personnel qualified and trained under Subpart B.

(c) Each MET service provider must retain the records or erroneous meteorological information required under GACAR §179.189 for at least the last one year unless a longer period is prescribed by the President.

§ 179.193 Promulgated Information Incident Reports.

(a) Each MET service provider must submit a promulgated information incident report to the President within 24 hours of the promulgated information incident.

(b) The report must include the following information:

- (1) Date and time of the incident;
- (2) Brief description of events;
- (3) Details to identify the meteorological information that was promulgated;
- (4) Details relating to the meteorological information that gave rise to the incident;
- (5) Name, organization, and contact details of the person notifying the incident.