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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) within the Jeddah FIR by a certified 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) Rules governing aircraft operators requiring meteorological service or changes in the meteorological services provided.

§ 179.3 Restrictions on a certified MET Service Provider.

(a) Except as provided in GACAR 170 §170.1(d), no person may provide MET services in the KSA for air navigation and within the Jeddah FIR unless the person complies with the provisions of this Part and has been certificated by the President under GACAR Part 170 to provide such services.

(b) Except as provided in GACAR Part 170, the certified MET service provider must comply with the limitations and provisions of their certificate, operations specifications, and manual prepared under Subpart C during the provision of meteorological service as defined by the President.

(c) No meteorological service must be provided if:

(1) required meteorological input data is unavailable or unreliable;

(2) essential equipment performance does not meet specified standards;

(3) required monitoring or verification systems are not operational; or

(4) there is reasonable doubt about meteorological data integrity or accuracy.

(d) The certification of a MET service provider must be considered as a formal arrangement between the President and the provider in the provision of defined meteorological services.

(e) The National Center for Meteorology (NCM) is the aeronautical MET service provider and is certified to provide meteorological service for domestic and international air navigation in the KSA. Details of the certified meteorological service provider must be included in the KSA aeronautical information

publication, in accordance with GACAR Part 175.

(f) The certified MET service provider must describe the arrangements for the provision of meteorological services within the Jeddah FIR in the KSA Aeronautical Information Publication (KSA AIP).

Note.— Detailed specifications concerning presentation and contents of the aeronautical information publication are defined in GACAR Part 175.

§ 179.5 Objective, determination and provision of meteorological service.

(a) The objective of meteorological service for air navigation must be to contribute towards the safety, regularity and efficiency of air navigation.

(b) The certified MET service provider must comply with the requirements of the WMO in respect of qualifications, competencies, education, and training of meteorological personnel providing service for domestic and international air navigation.

§ 179.7 Notifications Required from Operators.

a) An operator requiring meteorological service or changes in existing meteorological service must notify, sufficiently in advance, the certified MET service provider concerned. The minimum amount of advance notice required must be as agreed between the certified MET service provider or Aerodrome meteorological office, or station, and the operator concerned.

b) The certified MET service provider 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 certified MET service provider.

c) The certified MET service provider must make arrangements and coordination procedures with aircraft operators and users to:

(1) establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.

(2) notify the aerodrome meteorological office concerned:

(i) of flight schedules;

(ii) when non-scheduled flights are to be operated; and

(iii) when flights are delayed, advanced or cancelled.

d) The notification to the aerodrome meteorological office of individual flights must contain the following information except that, in the case of scheduled flights, the requirement for some or all of this information may be waived as agreed between the aerodrome meteorological office and the operator concerned:

(1) aerodrome of departure and estimated time of departure;

(2) destination and estimated time of arrival;

(3) route to be flown and estimated times of arrival at, and departure from, any intermediate aerodrome(s);

(4) alternate aerodromes needed to complete the operational flight plan and taken from the relevant list contained in the regional air navigation plan;

(5) cruising level;

(6) type of flight, whether under visual or instrument flight rules;

(7) type of meteorological information requested for a flight crew member, whether flight documentation and/or briefing or consultation; and

(8) time(s) at which briefing, consultation and/or flight documentation are required.

e) The President must be notified of all arrangements and coordination procedures between the certified MET service provider and all aircraft operators and users. The President must also be notified when operators require new or changes to existing meteorological services.

§ 179.9 Coordination Requirements.

(a) The certified MET service provider must establish systems and procedures for ensuring coordination between each of the following agencies:

(1) General Authority of Civil Aviation (GACA);

(2) Each aeronautical telecommunication service provider operating in accordance with GACAR Part 173;

(3) Each aeronautical information service (AIS) provider operating in accordance with GACAR Part 175;

(4) Each air traffic service provider (ATS) operating in accordance with GACAR Part 171;

(5) Each search and rescue (SAR) authority operating in accordance with GACAR Part 177;

(6) Aircraft operators;

(7) The Saudi Arabian Armed Forces;

(8) Each civil aerodrome operator and water aerodrome operator in the KSA operating in accordance with GACAR Part 137, 138 and 139;

(9) Certified unmanned traffic management (UTM) service provider; and

(10) Any other service providers or operators requesting MET Services.

(b) The certified MET service provider must establish coordination procedures with System wide Information Management (SWIM) registry operators and information service providers to ensure meteorological information compatibility with automated air traffic management systems. The coordination must include data format standardization, service level agreements for information exchange, and incident response procedures for system interoperability issues.

(c) All agreements and working arrangements must be submitted to the President for inclusion in the operation specifications.

§ 179.11 Regional Air Navigation Agreements.

The certified MET service provider must coordinate with GACA 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.

(a) The certified MET service provider must provide services in full compliance with this Part and the applicable standards and technical specifications of:

(1) ICAO Annex 3 Meteorological Service for International Air Navigation;

(2) ICAO Procedures for Air Navigation Services — Meteorology (PANS-MET, Doc 10157);

(3) WMO Technical Regulation, Volume I, General Meteorological Standards and Recommended Practices, (WMO-No 49, Vol. I);

(4) WMO Technical Regulation, Volume II, Meteorological Service for International Air Navigation, (WMO-No 49, Vol. II);

(5) Guide to Instruments and Methods of Observation (WMO-No. 8); and

(6) Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Provider (WMO-No. 1100).

(b) In respect of qualifications, competencies, education and training of meteorological personnel providing service for domestic and international air navigation, the certified MET service provider must adopt:

(1) the training and qualification requirements defined in WMO Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I – Meteorology (WMO-No 1083); and

(2) the WMO Technical Regulations Volume I — General Meteorological Standards and Recommended Practices, (WMO-No. 49, Vol I):

(i) Part V — Qualifications and Competencies of Personnel Involved in the Provision of Meteorological (Weather and Climate) and Hydrological Services;

(ii) Part VI — Education and Training of Meteorological Personnel; and

(iii) Appendix A — Basic Instruction Packages.

§ 179.15 Human Factors.

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

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

(b) The certified MET service provider must ensure that the meteorological information supplied to the users listed in §179.9 is provided through information services consistent with (SWIM) principles. The information services must enable machine-to-machine interaction in a service-oriented architecture, facilitate automated data processing, and maintain data integrity throughout the information exchange process.

Note 1.— In the context of (SWIM), the notion of information service addresses machine-to-machine interaction in a service-oriented architecture.

Note 2.— Procedures on information services are contained in the ICAO Procedures for Air Navigation Services — Information Management (PANS-IM, Doc 10199).

Note 3.— Guidance material on information services can be found in the ICAO Manual on System-wide Information Management Implementation (Doc 10039).

§179.17 Site Requirements.

The certified MET service provider must ensure that:

(a) Each of its aerodrome meteorological offices, stations, 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 weather observing station is installed and maintained in a technically appropriate position to ensure that the facility provides an accurate representation of the local and prevailing meteorological conditions. These observations must meet the operational desirable accuracy of measurement and observation as per ICAO PANS-MET, Doc 10157, Attachment A.

(c) Site security measures must prevent unlawful access and accidental interference with meteorological operations. Power supply arrangements must ensure service continuity during primary power failures through appropriate backup power systems.

§179.19 Verification, Validation, Periodic Inspection, Testing, and Calibration.

a) The certified MET service provider must ensure that all meteorological equipment is maintained to ensure required precision and accuracy levels are consistently achieved. The MET equipment maintenance records must document calibration results, performance verification, and any deviations from specified standards.

b) The certified MET service provider must establish procedures for:

(1) routine verification of meteorological information obtained and provided by the certified MET service provider;

(2) periodic inspection of each of its aerodrome meteorological offices/stations;

(3) periodic inspection, testing and calibration of each of its facilities; and

(4) validating information, bulletins and messages that are exchanged internationally to ensure accuracy, integrity, formatting and timeliness requirements.

c) The procedures required under §179.19 (a) 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 offices/stations;

(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 observing facilities are calibrated and configured so that the environmental sensors fitted or incorporated yield, as far as possible, reliable, accurate, and

representative of meteorological information. Calibration standards must be traceable to national or international measurement standards.

d) The certified MET service provider must ensure that digital meteorological information systems undergo regular validation to ensure IWXXM format compliance, data transmission accuracy, and system interoperability. The validation procedures must include end-to-end testing of automated data flows, verification of digital signature integrity, and assessment of system response times. Non-conformities must be documented and corrected within specified timeframes.

e) The certified MET service provider must establish procedures for verification of meteorological information accuracy and release authorization. The personnel competence for information verification and release must be formally assessed and documented.

f) The certified MET service provider must establish procedures for notification of operational status changes. When meteorological services are interrupted or degraded, appropriate NOTAM procedures must be followed, and affected users notified immediately.

§ 179.21 Inspections.

The certified MET service provider must allow the President to make any inspections, at any time, in order to allow the President to determine compliance with the requirements of this Part.

SUBPART B – PERSONNEL

§ 179.31 Personnel Requirements.

The certified MET service provider must employ, contract, or otherwise engage:

(a) A senior person, acceptable to the President, 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 regulatory requirements; and

(2) is responsible for ensuring that the organization complies with the requirements of this Part.

(b) A senior person or persons, acceptable to the President, responsible to the Director of Meteorological Services for ensuring that the organization:

(1) complies with its manual; and

(2) establishes and implements a properly organized quality system.

(c) Sufficient technical personnel to plan, operate, inspect, supervise, maintain the facilities listed in the manual, and certify all meteorological offices and facilities. The personnel allocation must be based on documented workload analysis and service requirements.

§ 179.33 Meteorological Personnel Qualifications.

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

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

(1) successfully completed an appropriate training program that is accepted by the President; and

(2) has been assessed as competent through a formal process by a person who is qualified.

(c) The certified MET service provider must provide each person assigned duties as meteorological personnel a certificate containing the following:

(1) name of the meteorological personnel;

(2) a description of the functions that the person is authorized to perform; and

(3) a description of the period during which the certificate is effective and valid.

(d) The certified MET service provider must ensure that the training organized for the delivery of the certificate comprises:

(1) a theory part as defined by the WMO; and

(2) a practical part which must include on-the-job training where the trainee is under the supervision of a certified and experienced meteorological observer or forecaster in order to:

(i) enable observing and forecast techniques to be practiced; and

(ii) allow the trainee's competence to be assessed to meet the competency requirements for Aeronautical Meteorological Personnel as defined by the WMO Technical Regulations (WMO-No. 49).

(e) The certified MET service provider must develop a periodic and comprehensive recurrent training program accepted by the President to ensure that each person assigned duties as meteorological personnel maintains the appropriate level of qualification. The established period must not exceed 18 months.

(f) The certified MET service provider must ensure that meteorological personnel receive training on digital meteorological information systems, including IWXXM format interpretation, automated system operations, quality assurance procedures for digital data, and cybersecurity awareness relevant to meteorological information management. The competency assessments must include an evaluation of digital system "proficiency.

(g) The certified MET service provider must establish procedures to assess and maintain the competence of all authorized meteorological personnel. Written evidence of personnel authorization must be maintained and made available for inspection. Competency assessments must be conducted at intervals not exceeding 18 months.

(h) The certified MET service provider must develop and publish job descriptions for all technical staff

assigned to provide MET services.

Note.— The meteorological personnel qualifications must be based on the standards and recommended practices of ICAO (Annex 3 and PANS MET - Doc 10157) and the WMO as defined under § 179.13.

§ 179.35 Staffing Levels and Training.

The certified 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 qualified 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 undertake the provision of MET services.

§ 179.37 Human Performance.

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

(1) mandating Human Factors input to specific tasks/projects;

(2) raising awareness of Human Factors and initiating Human Factors training across all concerned departments in an appropriate manner;

(3) keeping abreast of developments within Human Factors and applying this knowledge as appropriate.

(4) considering Human Factors aspects in incident investigation.

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

(b) The certified MET service provider must have processes and procedures to:

(1) ensure that each person assigned duties as meteorological personnel is not under the influence

of psychoactive substances or medication or suffering from any illness or injury to an extent that may impact their performance during the provision of aeronautical meteorological services;

(2) retain evidence that the duty time set by the adopted rostering arrangements and scheduling are not exceeded and that non-duty period requirements are met;

(3) ensure that assignment during unscheduled duties for meteorological personnel avoids extended periods of being awake;

(4) familiarize its meteorological personnel with the principles of fatigue management;

(5) ensure that variations from the duty time for addressing sudden, unforeseen operational circumstances will not impact the performance of meteorological personnel during the provision of aeronautical meteorological services.

SUBPART C – MANUAL REQUIREMENTS

§ 179.41 General.

This Subpart prescribes requirements for the certified MET service provider to prepare and maintain a manual covering all meteorological services provided in accordance with this Part and with the following WMO standards, recommended practices, and guidance:

(a) Technical Regulation, Volume I, General Meteorological Standards and Recommended Practices, (WMO-No 49, Vol. I);

(b) Technical Regulation, Volume II, Meteorological Service for International Air Navigation, (WMO-No 49, Vol. II); and

(c) Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I – Meteorology (WMO-No 1083).

(d) Guide to Instruments and Methods of Observation (WMO-No. 8),

§ 179.43 Manual Contents.

(a) The certified MET service provider must provide the President with a manual containing:

(1) a statement of compliance with applicable regulations 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 the lines of responsibility of the senior persons and the staffing level;

(3) a summary of the organization's staffing structure at each location listed under paragraph (a)(4);

(4) a list of MET locations and facilities to be operated under the authority of the certified MET service provider;

(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);

(6) a description of the initial training, qualifications, and certification of meteorological personnel;

(7) the detailed procedures required under §179.19 for verification, validation, periodic inspection, testing and calibration, §179.227 for users and customer feedback and § 179.223 regarding the quality management system;

(8) detailed procedures to control, amend, and distribute the manual;

(9) procedures for controlling all operational documentation, including technical standards, procedures, and manuals. Document control procedures must address revision approval processes, distribution control, and removal of obsolete versions using formal change management procedures; and

(10) procedures for obtaining all necessary meteorological input data tailored to each service provided. Procedures must ensure adequacy of meteorological equipment, displays, and observing systems for all authorized services.

(b) The manual must identify all output information for each meteorological service, establish output standards and formats, and include procedures to ensure compliance with these standards. Output verification procedures must be documented and implemented.

(c) Each manual, and all of its revisions, must be acceptable to the President.

(d) The certified MET service provider must:

(1) ensure that its manual is amended, as required, to maintain an up-to-date description of the certified MET service provider organization, services and facilities;

(2) ensure that any amendments made to its manual meet the applicable requirements of this Part;

(3) comply with the manual amendment procedure contained in its manual;

(4) ensure that each amendment to its manual is accepted by the President; and

(5) make such amendments to its manual as the President may consider necessary in the interests of aviation safety.

§ 179.45 Local observing and reporting procedures.

The certified MET service provider must ensure that local observing and reporting procedures:

(a) Are established for each aerodrome meteorological observation;

(b) Include the way in which observations are conducted, recorded, and disseminated both within and beyond the aerodrome, including any necessary backup arrangements;

(c) Include working arrangements to ensure that observers obtain full information regarding the weather to be expected during the period of their duty/watch. This may be accomplished by a study of forecasts and charts routinely supplied by the designated watch office; and

(d) Include a description of recurrent training to maintain the competency of assigned meteorological personnel.

SUBPART D – GLOBAL SYSTEMS, SUPPORTING CENTRES AND METEOROLOGICAL OFFICES

§ 179.51 Applicability.

This Subpart prescribes the requirements related to the World Area Forecast System, Aerodrome Meteorological services, Meteorological Watch Office services, advisory information on volcanic ash and tropical cyclones, and space weather phenomena.

§ 179.53 World Area Forecast Centers (WAFC) within the framework of the world area forecast system.

(a) The certified MET service provider must disseminate the following information received from the world area forecast center (WAFC):

(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;

(8) turbulence;

(9) significant weather (SIGWX) phenomena; and

(10) global forecasts of significant weather (SIGWX) phenomena.

(b) The certified MET service provider must disseminate:

(1) the forecasts referred to in (a) in digital form to the users;

(2) received information concerning the 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

(c) The certified MET service provider must establish and maintain contact with the associated WAFC for the collection of information on volcanic activity in order to make available information on volcanic eruptions in SIGWX forecasts to the users.

§ 179.55 Aerodrome Meteorological Offices.

(a) The certified 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 domestic and international 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 aerodrome meteorological 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;

(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 MWO as agreed between the meteorological service provider, aeronautical information service provider and air traffic service provider concerned.

(c) The aerodrome meteorological offices at which flight documentation is required, as well as the areas to be covered, must be described in the KSA AIP.

(d) The aerodromes for which landing forecasts are required will be determined by regional air navigation agreement (ICAO Regional Air Navigation Agreements (Doc 7030 / ANPs)).

(e) For aerodromes without an aerodrome meteorological office located at the aerodrome:

(1) the certified MET service provider must designate one or more aerodrome meteorological offices to supply meteorological information as required; and

(2) the certified MET service provider must establish means by which such information can be supplied to the aerodromes concerned.

§ 179.57 Meteorological Watch Offices (MWOs).

(a) The certified MET service provider must establish one or more MWO within the flight information regions or control areas for which they have been assigned MET responsibilities by the President.

(b) Each MWO 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 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) Each MWO must 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 area control center (ACC)/ flight information center (FIC), as agreed between the certified MET service provider and the ATS service provider, and to its associated VAAC as determined by regional air navigation agreement;

(d) Each MWO must 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 certified MET service provider and the appropriate ATS service provider, and to the AIS provider, as agreed between the certified MET service provider and the aeronautical information service (AIS) service provider. The information must comprise location, date and time of the release, and forecast trajectories of the radioactive materials, The information must comprise location, date and time of the release, and forecast trajectories of the radioactive materials;

(e) Each MWO must maintain a continuous watch, however in areas with a low density of traffic, the watch may be restricted to the period relevant to expected flight operations;

(f) The boundaries of the area over which meteorological watch is to be maintained by an MWO must be coincident with the boundaries of an FIR or a CTA or a combination of FIRs and/or CTAs; and

(g) Each Meteorological Watch Office (MWO) must coordinate, as necessary, the content of SIGMET messages with neighboring MWOs when an en-route weather phenomenon extends or is expected to extend beyond its area of responsibility, to ensure consistency and harmonization of SIGMET information.

Note.— Guidance on the bilateral or multilateral coordination between MWOs of Contracting States for the provision of SIGMET can be found in the ICAO Manual of Aeronautical Meteorological Practice (Doc 8896).

§ 179.59 Volcanic Ash.

The certified MET service provider must:

(a) Ensure that any received notification on volcanic eruptions or volcanic ash is made available to the users.

(b) Disseminate any received advisory information regarding the extent and forecast movement of the

volcanic ash cloud to:

(1) MWOs, area control centers and flight information centers;

(2) international NOTAM offices, and centers designated in KSA AIP for the operation of aeronautical fixed service Internet-based services; and

(3) airlines requiring the advisory information through the AFTN address provided specifically for this purpose.

(c) Disseminate any received updated advisory information to the MWOs, area control centers, and flight information centers.

(d) For significant volcanic ash "clouds" on which VAACs have issued forecasts of quantitative volcanic ash concentration information for a volcanic ash "cloud", the certified MET service provider must disseminate all the details on the quantitative volcanic ash concentration information for the volcanic ash "cloud" to users, as required under this Part. The quantitative information must include concentration levels, flight level ranges, and forecast trajectories with specified confidence intervals.

Note 1.— The VAACs in a position to provide quantitative volcanic ash concentration information are included in the ICAO Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List *(Doc 9766).*

Note 2.— Significant volcanic ash "clouds" in this context means an ash "cloud" that poses a widespread impact to aircraft operations and air navigation. Guidance on the criteria is provided in the ICAO Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List *(Doc 9766).*

Note 3.— Back-up procedures to be used in case of interruption of the operation of a VAAC are included in the ICAO Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List *(Doc 9766).*

§ 179.61 Tropical Cyclone Advisory Centers (TCAC).

The certified MET service provider must:

(a) Ensure any received information on the development of tropical cyclones is made available to the users.

(b) Disseminate any received advisory information concerning the position of the cyclone center,

changes in its intensity at the time of observation, its direction and speed of movement, central pressure and maximum surface wind near the center; to:

(1) MWOs, and;

(2) centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems.

(c) Disseminate any received updated advisory information for each tropical cyclone, as necessary, but at least every six hours.

§ 179.63 Space Weather Centers (SWXC).

(a) The certified MET service provider must take the required measures to:

(1) receive from the designated Space Weather Centers (SWXC) any advisory information on space weather phenomena affecting the Jeddah FIR;

(2) ensure that any received advisory information on space weather phenomena affecting the Jeddah FIR is made available to the users;

(3) Disseminate any received advisory information regarding the extent, severity, and duration of the space weather phenomena that have an impact in the following areas:

(i) high frequency (HF) radio communications;

(ii) communications via satellite;

(iii) GNSS-based navigation and surveillance; and

(iv) radiation exposure at flight levels.

(4) Ensure that the advisory information referred to in (a)(1) is disseminated to:

(i) area control centers, flight information centers, and aerodrome meteorological offices which may be affected; and

(ii) international NOTAM offices and centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

(5) Disseminate any updated advisory information on space weather phenomena, as necessary, but at least every six hours until such time as the space weather phenomena are no longer detected and/or are no longer expected to have an impact.

(b) The certified MET service provider who accepted the responsibility for providing a regional space weather center (SWXC) within the framework of the space weather information service, must arrange for that center to support the global SWXCs in their responsibilities as defined under ICAO Annex 3 Chapter 3.

SUBPART E – Aerodrome meteorological observational information

§ 179.71 Applicability.

This Subpart prescribes the requirements for meteorological observations and reports. It incorporates and adopts by reference ICAO Procedures for Air Navigation Services — Meteorology PANS-MET, Doc 10157), Chapter 2.

§ 179.73 Aeronautical Meteorological Stations and Observations.

(a) The certified MET service provider must establish, where necessary, aerodrome aeronautical meteorological stations. 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 certified MET service provider to ensure the compliance of meteorological service for air navigation with the provisions of this Part.

(b) 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.

(c) The certified 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, including instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly.

Note.— Guidance on the inspection of aeronautical meteorological stations including the frequency of inspections is given in the ICAO Manual on Automatic Meteorological Observing Systems at Aerodromes *(Doc 9837).*

(d) 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.

Note 1.— Categories of precision approach and landing operations are defined in ICAO Annex 6 – Operation of Aircraft, *Part I* – International Commercial Air Transport – Aeroplanes.

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

(e) Unless otherwise accepted 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. These devices must 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 must observe Human Factors principles and include back-up procedures.

(f) 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, and 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.

(g) 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.

(h) 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.

Note.— Guidance on the operationally desirable accuracy of measurement or observation is given contained in Attachment A to the PANS-MET (Doc 10157).

(i) 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 must 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 must be understood to be the most probable time.

Note.— Guidance on the operationally desirable accuracy of forecasts is given contained in Attachment B to the PANS-MET (Doc 10157).

(j) The meteorological instruments used at an aerodrome must be situated in such a way as to supply data which are representative of the area for which the measurements are required.

Note.— Specifications concerning the siting of equipment and installations on operational areas, aimed at reducing the risk of damage to aircraft to a minimum, are contained in Annex 14 – Aerodromes, Volume I – Aerodrome Design and Operations, Chapter 9.

(k) Meteorological instruments at aeronautical meteorological stations must be exposed, operated and maintained in accordance with the practices, procedures and specifications promulgated by the World Meteorological Organization (WMO).

Note.— Practices, procedures and specifications of WMO are contained in the Guide to Instruments and Methods of Observation (WMO-No. 8), Volume I – Measurement of Meteorological Variables, Volume III – Observing Systems; and Volume V – Quality Assurance and Management of Observing Systems.

(l) The observers at an aerodrome must be located, in so far as is practicable, so as to supply data which are representative of the area for which the observations are required.

§ 179.75 Agreement Between the certified MET Service Provider and the ATS Service Provider.

(a) An agreement between the certified MET service provider and the ATS service provider must be established to cover, among other things:

(1) the provision in air traffic services units of displays related to integrated automatic systems;

(2) the calibration and maintenance of these displays/instruments;

(3) the use to be made of these displays/instruments by air traffic services personnel;

(4) 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 office/station;

(5) meteorological information obtained from aircraft taking off or landing (for example, on wind shear); and

(6) if available, meteorological information obtained from ground weather radar.

(b) The agreement between the certified MET service provider and the ATS service provider must be complemented by local agreements signed between the aerodrome meteorological office or station and the ATS Unit providing services at the aerodrome to ensure effective coordination.

Note.1— Guidance on the subject of coordination between the certified MET service provider and the ATS service provider is contained in the ICAO Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services *(Doc. 9377).*

Note.2— The template of the local agreement is defined by a GACA Advisory Circular (to support effective implementation of a local agreement between an aerodrome MET Office/Station and an ATS Unit where ATS is provided).

§ 179.77 Routine Observations and Reports.

(a) At aerodromes, routine observations must be made throughout the 24 hours each day, except as otherwise agreed between the certified MET service provider, the ATS service provider and the operators concerned. Such observations must be made at intervals of one hour or at intervals of one half-hour as described in the KSA AIP. At other aeronautical meteorological stations, such observations must be made as determined by the certified MET service provider taking into account the requirements of air traffic services units and aircraft operations. The President must be notified on any agreement for the provision of routine observations.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 2.

(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

Note.— Technical specifications of the issuance of local routine reports are contained in the PANS-MET (Doc 10157), Chapter 2.

(2) METAR for dissemination beyond the aerodrome of origin (mainly intended for flight planning, VOLMET broadcasts and D-VOLMET).

Note.— Technical specifications of the issuance and the dissemination of METAR are contained in the PANS-MET (Doc 10157), Chapter 2.

(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.

Note.— Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local routine report by the certified ATS provider, in accordance with GACAR Part 171 §171.673

§ 179.79 Special Observations and Reports.

(a) A list of criteria for special observations must be established by the certified MET service provider in consultation with the ATS service provider, operators and others concerned, and in accordance with Annex 3 SARPs.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 2.

(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

Note.— Technical specifications for the issuance of local routine reports are contained in the PANS-MET (Doc 10157), Chapter 2.

(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.

Note.— Technical specifications for the issuance and the dissemination of METAR are contained in the PANS-MET (Doc 10157), Chapter 2.

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

§ 179.81 Characteristics of meteorological reports.

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

(1) surface wind direction and speed;

(2) visibility;

(3) runway visual range, when applicable;

(4) present weather;

(5) cloud amount, cloud type (only for cumulonimbus and towering cumulus clouds) and height of cloud base or, where measured, vertical visibility;

(6) air temperature and dew-point temperature; and

(7) QNH and, when applicable, QFE (QFE included only in local routine report and local special reports).

(b) In addition to elements listed under (a) (1) to (7), local routine reports, local special reports, METAR, and SPECI must contain supplementary information.

(c) Optional elements included under supplementary information must be included in METAR and SPECI.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 2.

§ 179.83 Use of CAVOK.

(a) When the following conditions occur simultaneously at the time of observation:

(1) visibility, 10 km or more, and the lowest visibility is not reported;

(2) no cloud of operational significance; and

(3) no weather of significance to aviation.

then the information on visibility, runway visual range, present weather and cloud amount, cloud type and height of cloud base must be replaced in all meteorological reports by the term “CAVOK”.

Note 1.— In local routine and special reports, visibility refers to the value(s) to be reported in accordance with §179.85(a) (2); in METAR and SPECI, visibility refers to the value(s) to be reported in accordance with the requirements of PANS-MET (Doc 10157) Chapter 2.

Note 2.— Visibility refers to "prevailing visibility" except in the case where only the lowest visibility is reported in accordance with the requirements of PANS-MET (Doc 10157) Chapter 2.

§ 179.85 Observing and Reporting Meteorological Elements.

(a) The following meteorological elements observed at a station making surface observations must be reported in all aeronautical meteorological reports:

Note.1— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 2.

(1) Surface wind.

(i) 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 knots, respectively.

(ii) when local routine and special reports are used for departing aircraft, the surface wind observations for these reports must 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 must be representative of the touchdown zone.

(iii) for METAR and SPECI, the surface wind observations must 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.

(2) Visibility.

(i) the visibility must be measured or observed and reported in meters or kilometers.

(ii) when local routine report and local special report are used for departing aircraft, the visibility observations for these reports must be representative of conditions along the runway; when local routine and local special report are used for arriving aircraft, the visibility observations for these reports must be representative of the touchdown zone of the runway.

(iii) for METAR and SPECI, the visibility observations must be representative of the

aerodrome.

Note.2— Guidance on the conversion of instrument readings into visibility is given in PANS MET (Doc 10157) Attachment D.

(3) Runway visual range.

Note.3— Guidance on the subject of runway visual range is contained in the ICAO Manual of Runway Visual Range Observing and Reporting Practices *(Doc 9328).*

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

(ii) runway visual range must 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 takeoff and having high-intensity edge lights and/or center line lights.

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

(iv) runway visual range assessments must 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.

Note.— The Human Observed Runway Visual range is based on ICAO Manual of Runway Visual Range Observing and Reporting Practices – Doc 9328, Chapter 10.

(4) Present weather.

(i) 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).

(ii) for local routine and special reports, the present weather information must be representative of conditions at the aerodrome.

(iii) for METAR and SPECI, the present weather information must be representative of conditions at the aerodrome and, for certain specified present weather phenomena, in its vicinity.

(5) Clouds.

(i) 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 feet.

(ii) cloud observations for local routine and special reports must be representative of the runway threshold(s) in use.

(iii) cloud observations for METAR and SPECI must be representative of the aerodrome and its vicinity.

(6) Air temperature and dew-point temperature.

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

(ii) observations of air temperature and dew-point temperature for local routine and special reports and METAR and SPECI must be representative of the whole runway complex.

(7) Atmospheric pressure, the atmospheric pressure must be measured, and QNH and QFE

values must be computed and reported in hectopascals.

(8) Supplementary information, the observations made at aerodromes must include the available supplementary information concerning significant meteorological conditions, particularly those in the approach and climb-out areas. Where practicable, the information must identify the location of the meteorological condition.

(b) 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.

(c) The certified MET service provider must ensure that all meteorological reports (METAR, SPECI) and forecasts (TAF) are disseminated in both traditional code form and ICAO meteorological information exchange model (IWXXM) format. The IWXXM format must comply with current WMO technical specifications and enable automated processing by receiving systems.

Note.4.— The transition to IWXXM-only dissemination will be completed by the date specified in regional air navigation agreements.

§ 179.87 Reporting Meteorological Information from Automatic Observing Systems.

(a) METAR and SPECI from automatic observing systems must be used by the certified MET service provider in a position to do so during non-operational hours of the aerodrome, and during operational hours of the aerodrome in consultation with users based on the availability and efficient use of personnel. METAR and SPECI from automatic observing systems must be approved by the President.

(b) Local routine report and local special report from automatic observing systems may be used during operational hours of an aerodrome as authorized by the President and in consultation with users based on the availability and efficient use of meteorological personnel.

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

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

(d) The Automatic observing systems must include capabilities for remote monitoring, fault detection, and automated quality checks.

(e) When automatic systems detect unobservable or uncertain conditions, reports must include appropriate indicators (e.g., "UP" for unknown precipitation, "///" for missing data) as specified in PANS-MET templates.

(f) The certified MET service provider must establish backup procedures for automatic system failures, including alternative data sources and manual observation protocols.

§ 179.91 Observing and Reporting 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 MWO.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 2.

§ 179.93 Dissemination of meteorological reports.

(a) METAR and SPECI must be disseminated to international OPMET databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with regional air navigation agreement.

(b) METAR and SPECI must be disseminated to other aerodromes in accordance with regional air navigation agreement.

(c) A SPECI representing a deterioration of one weather element and an improvement in another element must be disseminated immediately after the observation.

(d) A SPECI representing an improvement in conditions must be disseminated only after the improvement has been maintained for 10 minutes; it must be amended before dissemination, if necessary, to indicate the conditions prevailing at the end of that 10-minute period.

§ 179.95 Local routine report and local special report.

(a) Local routine reports must be transmitted to local air traffic services units and must be made available to the operators and to other users at the aerodrome.

(b) Local special reports must be transmitted to local air traffic services units as soon as the specified conditions occur. However, as agreed between the meteorological service provider and the appropriate ATS authority, they need not be issued in respect of:

(1) any element for which there is in the local air traffic services unit a display corresponding to the one in the meteorological station, and where arrangements are in force for the use of this display to update information included in local routine report and local special report; and
(2) runway visual range, when all changes of one or more steps on the reporting scale in use are being reported to the local air traffic services unit by an observer on the aerodrome.

(c) Local special reports must also be made available to the operators and to other users at the aerodrome.

SUBPART F – AIRCRAFT METEOROLOGICAL OBSERVATIONAL INFORMATION

§ 179.101 Applicability.

This Subpart prescribes the requirements for aircraft observations and reports. It incorporates and adopts by reference the Procedures for Air Navigation Services — Meteorology *(PANS-MET, Doc 10157), Chapter 3.*

§ 179.103 Relay of Air-Reports by ATS Units.

(a) The certified MET service provider must make arrangements with ATS provider to ensure that, on receipt by the ATS units of:

(1) special air-reports by voice communications, the ATS units relay them without delay to their associated MWO; and

(2) routine and special air-reports by data link communications, the ATS units relay them without delay to their associated MWO and WAFCs.

(b) The certified MET service provider must make arrangements with the appropriate certified ATS provider to ensure that:

(1) special air-reports be uplinked for 60 minutes after their issuance; and

(2) information on wind and temperature included in automated special air-reports not be uplinked to other aircraft in flight.

§ 179.105 Dissemination of air-reports

(a) The MWO must transmit without delay the special air-reports received by voice communications to the world area forecast centers (WAFCs) and the centers designated by the regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

(b) The MWO must transmit without delay special air-reports of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud received from the associated volcanic ash advisory centers.

(c) When a special air-report is received at the MWO but the forecaster considers that the phenomenon causing the report is not expected to persist and, therefore, does not warrant issuance of a SIGMET, the special air-report must be disseminated in the same way that SIGMET information is disseminated in accordance with ICAO (Annex 3) section 7, i.e. to MWOs, WAFCs, and other meteorological offices in accordance with regional air navigation agreement.

Note.— The template used for special air-reports which are uplinked to aircraft in flight is in the PANS-MET (Doc 10157), Appendix 3, Table A3-2.

(d) Air-reports received from WAFCs must be further disseminated as basic meteorological data.

(e) Air-reports must be exchanged in the format in which they are received.

SUBPART G – AERODROME AND EN-ROUTE METEOROLOGICAL FORECAST INFORMATION

§ 179.111 Applicability.

This Subpart prescribes the requirements for aerodrome forecasts and area forecasts for low-level flights. It incorporates and adopts by reference ICAO PANS-MET (Doc 10157):

(a) Standards and Recommended Practices contained in PANS-MET (Doc 10157), Chapter 4;

(b) Guidance on the operationally desirable accuracy of forecasts contained in Attachment B to the PANS-MET (Doc 10157).

Note.—The Standards and Recommended Practices in ICAO Annex 3, Chapter 6 are to be used in conjunction with the Procedures for Air Navigation Services — Meteorology (PANS-MET, Doc 10157), Chapters 4 and 5.

§ 179.113 Interpretation and Use of Forecasts.

(a) 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.

(b) An aerodrome forecast must be prepared, in accordance with regional air navigation agreement, by the aerodrome meteorological office designated by the certified MET service provider.

Note.— The aerodromes for which aerodrome forecasts are to be prepared and the period of validity of these forecasts are listed in ICAO MID Air Navigation Plan, Vol II, Facilities And Services Implementation Document (FASID) *(Doc 9708).*

§ 179.115 Aerodrome Meteorological Forecast Information.

(a) The certified MET service provider 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 meteorological elements:

(1) surface wind;

(2) visibility;

(3) weather;

(4) cloud; and

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

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

Note.— Technical specifications for the issuance of aerodrome forecast are contained in the PANS-MET (Doc 10157) Chapter 4.

(d) The certified MET service provider 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 must be not less than 6 hours nor more than 30 hours; the period of validity must be determined by regional air navigation agreement. Routine TAF valid for less than 12 hours must be issued every 3 hours and those valid for 12 to 30 hours must 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.

(h) TAF and amendments thereto must be disseminated to international OPMET databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with regional air navigation agreement.

Note.1— Guidance on methods to keep TAF under continuous review is given contained in the ICAO Manual of Aeronautical Meteorological Practice *(Doc 8896)* Chapter 3.

Note.2— The aerodromes for which aerodrome forecasts are to be prepared and the period of validity of these forecasts are listed in the MID Region ICAO Air Navigation Plan (ANP), Volume II.

§ 179.117 Landing Forecasts (trend forecasts).

(a) The certified MET service provider 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.

(d) The units and scales used in the trend forecast must be the same as those used in the report to which it is appended.

Note.1— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 4.

Note.2— Technical specifications for the issuance of trend forecast are contained in the PANS-MET (Doc 10157) Chapter 4.

§ 179.119 Forecasts for Takeoff.

(a) The certified MET service provider must prepare a takeoff forecast if required by agreement between the certified MET service provider and operators.

(b) The forecast for takeoff must refer to a specified period of time and must 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 must 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.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 4.

§ 179.121 Area Forecasts for Low-Level Flights.

(a) The Area forecasts must be provided in both textual (GAMET) and graphical formats using standardized symbols and scales as specified in PANS-MET.

(b) The digital area forecast products must include gridded meteorological data with specified resolution and accuracy parameters. Forecast elements must include quantitative precipitation, icing probability, turbulence intensity indices, and mountain wave indicators where applicable.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 5.

§ 179.123 Area Forecasts for Low-Level Flights (GAMET, and area forecasts in chart form).

(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, the dissemination and the criteria for amendments thereto must be established by the certified MET service provider in consultation with the users and UTM Service Provider.

(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 providers concerned. 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.

Note.— Template of GAMET is contained in the PANS-MET (Doc 10157), Appendix 6, Table A6-1.

(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 MWOs and/or aerodrome meteorological offices concerned not later than one hour prior to the beginning of their validity period.

(d) Area forecasts for low-level flights prepared in support of the issuance of AIRMET information must be exchanged between aerodrome meteorological offices and/or MWOs responsible for the issuance of flight documentation for low-level flights in the flight information regions concerned.

(e) Area forecasts for low-level flights prepared in support of the issuance of AIRMET information must

be disseminated to the aeronautical fixed service Internet-based services.

Note.— Area forecasts for low-level flights in ICAO Annex 3 (6.3.2.4 and 6.3.2.5) are prepared in accordance with regional air navigation agreement, similar to the corresponding AIRMET information.

§ 179.125 Forecasts by volcanic ash advisory centers

The certified MET service provider, when receiving forecasts of quantitative volcanic ash concentration information for a volcanic ash "cloud" from volcanic ash advisory centers, must process the information using the appropriate format and codes.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 5.

SUBPART H – METEOROLOGICAL INFORMATION CONTAINING ADVISORIES, ALERTS, WARNINGS AND NOTICES

§ 179.131 Applicability.

This Subpart prescribes the requirements for SIGMET, AIRMET information, aerodrome warnings, and wind shear warnings and alerts. It incorporates and adopts by reference the Procedures for Air Navigation Services — Meteorology *(PANS-MET, Doc 10157)*, Chapter 6.

§ 179.133 Volcanic ash advisory information and information from State volcano observatories

The MWO must disseminate advisory information on volcanic ash issued by a volcanic ash advisory center to all concerned parties.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

§ 179.135 Tropical cyclone advisory information

The advisory information received on tropical cyclones must be disseminated to all concerned parties by the MWO.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

§ 179.137 Space weather advisory information.

The advisory information on space weather issued by space weather center (SWXC) must be disseminated to all concerned parties by the MWO.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

§ 179.139 SIGMET Information.

(a) SIGMET information must be issued by a MWO and must give a concise description 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. One of the following phenomena must be included in SIGMET information:

(1) thunderstorm;

(2) tropical cyclone;

(3) turbulence;

(4) icing;

(5) mountain wave;

(6) duststorm;

(7) sandstorm;

(8) volcanic ash; and

(9) radioactive cloud.

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

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

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

(f) SIGMET information must be issued not more than 4 hours before the commencement of the period of validity. In the special case of SIGMET information for volcanic ash cloud and tropical cyclones, this information must be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity. SIGMET information for volcanic ash and tropical cyclones must be updated at least every 6 hours.

(g) SIGMET information must be disseminated in IWXXM format and include standardized elements for automated processing such as phenomenon identification, geographic boundaries using standardized coordinate systems, altitude ranges, movement vectors, intensity changes, and forecast confidence indicators. SIGMET for radioactive cloud dispersion must include additional elements as specified in PANS-MET technical specifications

§ 179.141 Dissemination of SIGMET information

(a) SIGMET information must be disseminated to MWOs, WAFCs, and to other meteorological offices in accordance with the regional air navigation agreement. SIGMET information for volcanic ash must also be disseminated to volcanic ash advisory centers.

(b) SIGMET information must be disseminated to international OPMET databanks and the centers designated by the regional air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with the regional air navigation agreement.

(c) SIGMET information must be disseminated in IWXXM format and include standardized elements for automated processing, such as phenomenon identification, geographic boundaries using standardized coordinate systems, altitude ranges, movement vectors, intensity changes, and forecast confidence indicators. SIGMET for radioactive cloud dispersion must include additional elements as specified in PANS-MET technical specifications.

§ 179.143 AIRMET Information.

(a) AIRMET information must be issued by MWO in accordance with regional air navigation agreement, taking into account the density of air traffic operating below flight level 100 (or below flight level 150 in mountainous areas, or higher, where necessary). AIRMET information must give a concise description 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. One of the following phenomena must be included in AIRMET information:

(1) surface wind speed;

(2) surface visibility;

(3) thunderstorms;

(4) mountain obscuration;

(5) cloud;

(6) icing;

(7) turbulence; and

(8) mountain wave.

(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.

Note.1— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

Note.2— Technical specifications for the issuance of AIRMET are contained in the PANS-MET (Doc 10157) Chapter 6.

§ 179.145 Aerodrome Warnings.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

(a) Aerodrome warnings must be issued by the aerodrome meteorological office operated under the certified MET service provider. Aerodrome warnings must give concise information of meteorological conditions which could adversely affect aircraft on the ground, including parked aircraft, and the aerodrome facilities and services. The warnings must specify quantitative thresholds, expected duration, confidence levels, and recommended operational actions.

(b) Aerodrome warnings must relate to the occurrence or expected occurrence of one or more of the following phenomena:

(1) tropical cyclone (to be included if the 10-minute mean surface wind speed at the aerodrome is expected to be 17 m/s (34 kt) or more)

(2) thunderstorm

(3) hail

(4) snow (including the expected or observed snow accumulation)

(5) freezing precipitation

(6) frost

(7) hoar frost or rime

(8) sandstorm

(9) duststorm

(10) rising sand or dust

(11) strong surface wind and gusts

(12) Squall

(13) volcanic ash (including volcanic ash deposition)

(14) Tsunami

(15) toxic chemicals

(16) other phenomena as agreed locally.

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

(d) Aerodrome warnings must be issued in a standardized format, including structured data elements for automated processing.

Note.1— Template of aerodrome warnings is contained in the PANS-MET (Doc 10157), Appendix 7, Table A7-6.

Note.2— Aerodrome warnings related to the occurrence or expected occurrence of tsunami are not required where a national public safety plan for tsunami is integrated with the "at risk" aerodrome concerned.

§ 179.147 Dissemination of aerodrome warnings.

Aerodrome warnings must be disseminated in accordance with local arrangements for those concerned.

§ 179.149 Wind Shear Warnings and Alerts.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 6.

(a) Wind shear warnings must be issued by the aerodrome meteorological office of the certified MET service provider 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.

Note.— Template of wind shear warnings is contained in the PANS-MET (Doc 10157), Appendix 7, Table A7-7.

(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 certified MET service provider, the appropriate ATS service provider and the operators concerned.

(d) 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 must be issued. Wind shear alerts must give concise, up-to-date information related to the observed existence of wind shear 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.

(e) Wind shear warnings must include specific runway information, altitude ranges affected, and intensity indicators as defined in PANS-MET (10157) Chapter 6 technical specifications.

§ 179.151 Dissemination of wind shear warnings and alerts.

(a) The wind shear warnings must be disseminated in accordance with local arrangements to those concerned.

(b) The wind shear alerts must be disseminated from automated, ground-based, wind shear remote-sensing or detection equipment in accordance with local arrangements to those concerned.

SUBPART I – AERONAUTICAL CLIMATOLOGICAL INFORMATION

§ 179.161 Applicability.

This Subpart prescribes the requirements for aeronautical climatological information. It incorporates and adopts by reference the provision contained in Procedures for Air Navigation Services — Meteorology (PANS-MET, Doc 10157), Chapter 7.

§ 179.163 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 certified 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.

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

Note 1.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 7.

Note 2.— 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 as agreed between the meteorological provider concerned.

§ 179.165 Aerodrome Climatological Tables & Summaries

(a) The certified MET service provider must make arrangements for collecting and retaining the necessary observational data and have the capability:

(1) to prepare aerodrome climatological tables for each civil aerodrome within the KSA; and

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

(b) The certified MET service provider must prepare aerodrome climatological summaries in accordance with the procedures prescribed by the WMO. Where computer facilities are used to store, process and retrieve the information, the summaries must be published or otherwise made available to aeronautical users on request. Where such computer facilities are not available, the summaries must be prepared using the models specified by the WMO and must be published and kept up to date as necessary.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 7.

§ 179.167 Copies of Meteorological Observational Data.

The certified 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.

§ 179. 169 Exchange of aeronautical climatological information.

Aeronautical climatological information must be exchanged on request between meteorological service provider. Operators and other aeronautical users desiring such information must contact the certified meteorological service provider responsible for its preparation.

SUBPART J – METEOROLOGICAL SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

§ 179.171 Applicability.

This Subpart prescribes the requirements for meteorological information that must be provided to aircraft operators and flight crew members. It incorporates and adopts by reference with the Procedures for Air Navigation Services — Meteorology *(PANS-MET, Doc 10157)*, Chapter 8.

§ 179.173 General.

(a) The certified 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) The certified MET service provider, in consultation with the operator, must determine:

(1) the type and format of meteorological information to be supplied; and

(2) methods and means of supplying that information.

(c) 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.

(d) Meteorological information supplied to operators and flight crew members must be up to date and include:

(1) aerodrome and en-route observational information; and

(2) aerodrome and en-route forecast information.

Note.— The list of meteorological information to be supplied to operators and flight crew members is contained in PANS-MET (Doc 10157), Chapter 8.

(e) En-route forecasts information 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 certified MET service provider and the operator concerned.

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

(g) 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.

(h) Meteorological information for pre-flight planning and in-flight replanning by operators of helicopters flying to offshore structures must include data covering the layers from sea level to flight level 100.

(i) When necessary, the certified MET service provider providing service arranging for the provision of meteorological 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 certified 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 certified MET service provider and the operator concerned.

§ 179.175 Briefing, Consultation and Display.

Note.— The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are contained in § 179.179.

(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 certified MET service provider and the operator, in lieu of flight documentation.

(b) Meteorological information used for briefing, consultation and display must include all of the information listed in § 179.173 (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 certified 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.

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

(f) The material displayed must be readily accessible to the flight crew members or other flight operations personnel concerned.

(g) The arrangements related to the Meteorological information used for briefing, consultation and display must be reported to the President.

§ 179.177 Flight Documentation.

Note.1— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 8.

Note.2— The requirements for the use of automated pre-flight information systems in providing flight documentation are contained in § 179.179.

(a) Flight documentation to be made available must comprise information listed under § 179.173 (c).

(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 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.

(d) The flight documentation related to concatenated route-specific upper wind and upper-air temperature forecasts must be provided as agreed between the meteorological service provider and the operator concerned.

Note.— Guidance on the design, formulation and use of concatenated charts is contained in the ICAO Manual of Aeronautical Meteorological Practice *(Doc 8896).*

(e) Meteorological information received from other meteorological offices must be included in flight documentation without change modification.

(f) Charts included in flight documentation must have a high standard of clarity and legibility.

Note.— The details of the characteristics of charts to be included in flight documentation are contained the Procedures for Air Navigation Services – Meteorology *(PANS-MET, Doc 10157), Chapter 8.*

(g) The certified meteorological 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, on request, for inquiries or investigations and, for these purposes, must be retained until the inquiry or investigation is completed.

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

(a) Where the certified 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 § 179.173 to 179.177 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 certified MET service provider must:

(1) establish arrangement with AIS service provider to supply regular and timely up- to-date meteorological information to ensure continuous updating of the automated pre-flight information systems database used for self-briefing, flight planning and flight information service in accordance with the requirements of GACAR Part 175 §175.127 (f);

(2) remain responsible for the quality control and quality management of meteorological information provided by means of such systems.

(3) ensure that the systems provide real-time data updates with timestamp verification and data source identification.

(4) ensure that user authentication and access logging must be implemented for security and accountability.

(5) ensure that the system supports the integration with SWIM-compliant information services for seamless data exchange.

(6) ensure high availability of the system with documented backup procedures.

(c) Automated pre-flight information systems providing self-briefing facilities must provide access by operators and flight crew members to consultation, as necessary, with an aerodrome meteorological office by telephone or other suitable telecommunications means.

(d) Systems must provide real-time data updates with timestamp verification and data source identification.

(e) User authentication and access logging must be implemented for security and accountability.

(f) Integration with SWIM-compliant information services must be supported for seamless data exchange.

(g) System availability must meet 99.5% uptime requirement with documented backup procedures.

Note .1 — Procedures and technical specifications related to this section are contained in the PANS-MET, Doc 10157, Chapter 8.

Note. 2— The responsibilities relating to aeronautical information services information and the quality

assurance of the information are addressed under GACAR Part 175.

§ 179.181 Meteorological information for Aircraft in Flight.

(a) Meteorological information for use by aircraft in flight must be supplied by an aerodrome meteorological office or MWO 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 certified 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.

(d) When an aircraft in flight requests meteorological information, the aerodrome meteorological office or MWO which receives the request must arrange to supply the information with the assistance, if necessary, of another aerodrome meteorological office or MWO.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 8.

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

§ 179.191 Applicability.

This Subpart prescribes the requirements for meteorological information that must be provided to air traffic services, search and rescue services and aeronautical information services. It incorporates and adopts by reference the provisions contained in ICAO PANS-MET (Doc 10157), Chapter 9.

§ 179.193 Information for ATS Units.

(a) The certified MET service provider must designate an aerodrome meteorological office or MWO to be associated with each air traffic services unit. The associated aerodrome meteorological office or MWO 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) An aerodrome meteorological office must be associated with an aerodrome control tower or approach control unit for the provision of meteorological information.

(c) A MWO must be associated with a flight information center or an area control center for the provision of meteorological information.

(d) Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or MWO to be shared between two or more aerodrome meteorological offices or MWO, the division of responsibility must be determined by the certified 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.

§ 179.195 Supply, dissemination and transmission arrangements to ATS Units.

(a) Where necessary for flight information purposes, current meteorological reports and forecasts must be supplied to designated aeronautical telecommunication stations. A copy of such information must be forwarded, if required, to the FIC or ACC.

(b) When computer-processed upper-air grid point data in digital form is made available to air traffic services units for use by air traffic services computers, the transmission arrangements must be as agreed between the meteorological service provider and the appropriate ATS authority. The data must be supplied as soon as is practicable after the processing of the forecasts has been completed.

§ 179.197 Information for SAR Units.

(a) The certified MET service provider in accordance with regional air navigation agreement must supply SAR services units with the meteorological information they require in a form established by mutual agreement. For that purpose, the certified MET service provider must maintain liaison with the search and rescue services units throughout a search and rescue operation.

(b) Information to be supplied to rescue coordination centers must include the meteorological conditions that existed in the last known position of a missing aircraft and along the intended route of that aircraft with particular reference to:

(1) significant en-route weather phenomena;

(2) cloud amount and type, particularly cumulonimbus; height indications of bases and tops;

(3) visibility and phenomena reducing visibility;

(4) surface wind and upper wind;

(5) state of ground, in particular, any snow cover or flooding;

(6) sea-surface temperature, state of the sea, ice cover if any and ocean currents, if relevant to the search area; and

(7) sea-level pressure data.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 9

§ 179.199 Information for AIS provider.

(a) The certified MET service provider must supply up- to-date meteorological information to relevant AIS provider, as necessary, for the conduct of their functions.

(b) The following information must be supplied, as necessary, to an aeronautical information services unit:

Note.— Details of this information are contained in the GACAR Part 175 § 175.175 (Appendix 2).

(1) information on meteorological service for international air navigation, intended for inclusion in the aeronautical information publication(s) concerned;

(2) information necessary for the preparation of NOTAM or ASHTAM including, in particular, information on:

(i) the establishment, withdrawal and significant changes in operation of aeronautical meteorological services. This information is required to be provided to the aeronautical information services unit sufficiently in advance of the effective date to permit issuance of NOTAM in accordance with GACAR Part 175 -SUBPART E;

(ii) the occurrence of volcanic activity; and

Note.— The specific information required is contained in ICAO Annex 3, Chapter 3 and 4.

(iii) release of radioactive materials into the atmosphere, as agreed between the meteorological and appropriate civil aviation authorities concerned; and

Note.— The specific information required is contained in ICAO Annex 3, Chapter 3.

(3) information necessary for the preparation of aeronautical information circulars including, in particular, information on:

(i) expected important changes in aeronautical meteorological procedures, services and facilities provided; and

(ii) effect of certain weather phenomena on aircraft operations.

SUBPART L –USE OF COMMUNICATIONS TO EXCHANGE METEOROLOGICAL INFORMATION

§ 179.201 Applicability.

This Subpart prescribes the requirements for and use of telecommunications facilities supporting the provision of aeronautical meteorological services. It incorporates and adopts by reference the Procedures for Air Navigation Services — Meteorology (PANS-MET, Doc 10157), Chapter 10.

§ 179.203 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 MWOs 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 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.

(d) Telecommunications facilities between aerodrome meteorological offices or MWOs and flight information centers, area control centers, rescue coordination centers must permit:

(1) 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

(2) printed communications, when a record is required by the recipients; the message transit time must not exceed 5 minutes.

(e) The telecommunications facilities required in accordance with § 179.163 (d) and § 179.163 (e) can be supplemented, as and where necessary, by other forms of visual or audio communications, for example,

closed-circuit television or separate information processing systems.

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

(g) The telecommunications facilities used for the exchange of operational meteorological information must be the aeronautical fixed service or, for the exchange of non-time critical operational meteorological information, the public Internet, subject to availability, satisfactory operation and bilateral/multilateral and/or regional air navigation agreements.

(h) As agreed between the certified MET service provider and the operators concerned, the provision of aeronautical meteorological services must be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.

(i) When upper-air grid point data in digital form is made available for use by air traffic services computers, the transmission arrangements must be as agreed between the certified Met service provider and the appropriate ATS service provider.

(j) When upper-air grid point data in digital form is made available to operators for flight planning by computer, the transmission arrangements must be as agreed between the world area forecast center concerned, the certified Met service provider, and the operators concerned.

Note.— In Paragraph (d) and (e), "approximately 15 seconds" refers to telephony communications involving switchboard operation and "5 minutes" refers to printed communications involving retransmission.

§ 179.205 Use of aeronautical fixed service communications and the public Internet.

(a) Communication systems must be capable of handling required meteorological information without introducing unacceptable delays that could compromise aviation safety. System performance must be regularly monitored and documented.

(b) Public Internet may be used for meteorological information exchange when reliability, security, and performance requirements are met through documented agreements between service providers.

(c) All digital meteorological information exchange must support data integrity verification, authentication mechanisms, and appropriate cybersecurity measures.

(d) Backup communication must be available and maintained when primary Internet-based services are

unavailable.

(e) Electronic data processing facilities must ensure adequacy, accuracy, and timeliness of all meteorological data processing. Processing system performance must be continuously monitored, and backup processing capabilities must be available.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 10.

§ 179.207 Meteorological bulletins.

(a) Meteorological bulletins containing operational meteorological information to be transmitted via the aeronautical fixed service or the public Internet must 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 ICAO Annex 10, Volume II, Chapter 4, together with the relevant priorities and priority indicators.

(b) Messages and bulletins containing operational meteorological information must achieve transit times of less than 5 minutes, unless otherwise determined to be lower by a regional air navigation agreement.

§ 179.209 World area forecast system forecasts.

(a) The telecommunications facilities used for the supply of WAFS forecasts must be the aeronautical fixed service or the public Internet.

(b) WAFS must be disseminated using data communications techniques, The method and channels used for the dissemination of the forecasts must be as determined by regional air navigation agreement.

§ 179.211 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.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 10.

§ 179.213 Use of Aeronautical Data Link Service –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.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 10.

§ 179.215 Use of Aeronautical Broadcasting Service –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.

Note.— Procedures and technical specifications related to this section are contained in the PANS-MET (Doc 10157), Chapter 10.

SUBPART M – QUALITY MANAGEMENT SYSTEM

§ 179.221 Applicability.

This Subpart prescribes the requirements for a quality management system to be implemented by the certified MET service provider.

Note. — The following reference material provides information that may be used in the development of a quality management system:

- *Manual on the* ICAO Quality Management System for the Provision of Meteorological Service for International Air Navigation *(Doc. 9873);*
- *WMO Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Provider (WMO-No. 1100);*
- *The International Organization for Standardization (ISO) 9001 series of quality assurance standards.*

§ 179.223 Quality Management System.

(a) The certified MET service provider must establish and maintain a properly organized quality management system containing procedures, processes, and resources necessary to implement quality management for all aeronautical meteorological services provided under this Part.

(b) The quality system must be in conformity with the International Organization for Standardization (ISO) 9001 series of quality assurance standards and certified by an approved organization.

(c) Within the context of the certified MET service provider 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) The certified 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.

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 included in PANS-MET (Doc 10157) and the relevant regional air navigation plans. Provisions concerning the accuracy of measurement and observation, and the accuracy of forecasts are contained in Attachments A and B, respectively, to the PANS-MET.

(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 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.

Note.— Requirements concerning the exchange of operational meteorological information are contained in ICAO Annex 3, Chapter 11 and PANS-MET (Doc 10157) Chapter10.

(g) The quality management system must include procedures for continuous monitoring of service delivery performance, customer satisfaction measurement, and implementation of corrective and preventive actions based on performance indicators and customer feedback.

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

(i) Within the quality management 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 on 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. — Requirements concerning the exchange of operational meteorological information are contained in ICAO Annex 3 Chapter 11 and PANS-MET (Doc 10157) Chapter 10.

§ 179.225 Customer Forum.

The certified 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. GACA must be informed, in advance, and may attend any meetings as an observer.

§ 179.227 Users and Customer Feedback.

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

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

(a) The certified MET service provider must establish procedures for:

(1) a full non-routine observation at the time of an aircraft accident on or in the vicinity of the aerodrome to ensure that complete details of the weather at the time of the incident will be available to an investigation.

(2) 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 certified MET service

provider 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.

(c) Following any aircraft accident or incident, the certified MET service provider must conduct a prompt review of all relevant meteorological information provided. All reviewed information must be securely stored and made available to investigating authorities upon request.

§ 179.231 Malfunctions and Erroneous Information Management.

The certified MET service provider must:

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

(b) Identify, record, notify, investigate root causes, 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;

(d) maintain detailed status records and follow-up documentation;

(e) Submit reports to the President as prescribed under GACAR §179.301; and

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

SUBPART N – RECORDS AND REPORTS

§ 179.301 Document Retention.

(a) The certified 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 KSA "National Transportation Safety Center", on request, for inquiries or investigations and, for these purposes, must be retained until the inquiry or investigation is completed.

(b) The certified MET service provider must retain experience, qualifications, and training records, for at least the last three years for all active meteorological personnel qualified and trained under Subpart B. The personnel records must be retained for a minimum of five years after termination of employment and must be available for regulatory inspection.

(c) The certified MET service provider must maintain records of all meteorological input and output data, equipment performance history, malfunction reports and corrective actions, and quality assurance activities. Record retention periods must comply with regulatory requirements and investigation needs.

(d) The certified MET service provider must retain the records or erroneous meteorological information required under GACAR §179.301 for at least the last year unless a longer period is prescribed by the President.

§ 179.303 Promulgated Information Incident Reports.

(a) The certified 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.