

**CIVIL AVIATION REGULATIONS**

**SURINAME**

**PART 19 - METEOROLOGICAL SERVICES**

**VERSION 2.0**

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AMENDMENTS

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## 19.1 APPLICABILITY

1. These Regulations shall apply to the meteorological services provider.
2. These Regulations do not apply to:
  - a) A person who is providing a meteorological service in the course of his or her duties for the Military; or
  - b) any meteorological service provided by the Military.

### 19.1.1 RELATED DOCUMENTS

These Regulation shall be used in conjunction with Annex 3 and ICAO DOC 8896

## 19.2 GENERAL PROVISIONS

### 19.2.1 Objective, determination and provision of meteorological service

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

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

19.2.1.3 The meteorological service provider shall determine the meteorological service which it will provide to meet the needs international air navigation. This determination shall be made in accordance with the Provisions of these regulations and with due regard to regional air navigation agreements; it shall include the determination of the meteorological service to be provided for international air navigation over international waters and other areas which lie outside the territory of Suriname.

19.2.1.4 Suriname shall designate the authority, hereinafter referred to as the meteorological service provider of meteorological service for international air navigation on its behalf. Details of the meteorological service provider so designated shall be is included in aeronautical information publication, in accordance with CARS 20.5.

19.2.1.5 The meteorological service provider shall comply with the requirements of the World Meteorological Organization in respect of qualifications, competencies, education and training of meteorological personnel providing service for international air navigation.

*Note.*— Requirements concerning the qualifications, competencies, education and training of meteorological personnel in aeronautical meteorology are given in the Technical Regulations (WMO-No. 49), Volume I — General Meteorological Standards and Recommended Practices, Part V — Qualifications and Competencies of Personnel Involved in the Provision of Meteorological (Weather and Climate) and Hydrological Services, Part VI — Education and Training of Meteorological Personnel, and Appendix A — Basic Instruction Packages.

### 19.2.2 Supply, use, quality management and interpretation of meteorological information

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

19.2.2.2 Suriname shall ensure that the designated meteorological service provider, referred to in 19.2.1.4 shall establish and implement a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the users listed in 19.2.1.2.

19.2.2.3 The quality system established in accordance with 19.2.2.2 shall be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards and shall be certified by an approved organization.

Note.— The ISO 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization. Guidance on the establishment and implementation of quality management systems is given in the Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers (WMO-No. 1100).

19.2.2.4 The quality system shall 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 shall not be supplied to the users unless it is validated with the originator.

Note.— Requirements concerning the geographical and spatial coverage, format and content, time and frequency of issuance and period of validity of meteorological information to be supplied to aeronautical users are given in Chapters 19.3, 19.4, 19.6, 19.7, 19.8, 19.9 and 19.10 and Appendices 2, 3, 5, 6, 7, 8 and 9 of Annex 3 and the relevant regional air navigation plans. Guidance concerning the accuracy of measurement and observation, and accuracy of forecasts is given in Attachments A and B of Annex 3.

19.2.2.5 In regard to the exchange of meteorological information for operational purposes, the quality system shall 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 shall be capable of detecting excessive transit times of messages and bulletins received.

Note.— Requirements concerning the exchange of operational meteorological information are given in Chapter 19.11 and Appendix 10 of Annex 3

19.2.2.6 Demonstration of compliance of the quality system applied shall be by audit. If non-conformity of the system is identified, action shall be initiated to determine and correct the cause. All audit observations shall be evidenced and properly documented.

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

*Note.— Guidance on the operationally desirable accuracy of measurement or observation is given in Attachment A of Annex 3*

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

*Note.— Guidance on the operationally desirable accuracy of forecasts is given in Attachment B of Annex 3.*

19.2.2.9 The meteorological information supplied to the users listed in 19.2.1.2 shall be consistent with Human

Factors principles and shall be in forms which require a minimum of interpretation by these users, as specified in the following chapters.

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

### 19.2.3 Notifications required from operators

19.2.3.1 An operator requiring meteorological service or changes in existing meteorological service shall notify, sufficiently in advance, the meteorological service provider or the aerodrome meteorological office concerned. The minimum amount of advance notice required shall be as agreed between the meteorological service provider or aerodrome meteorological office and the operator concerned.

19.2.3.2 The meteorological service provider shall be notified by the operator requiring service when:

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

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

19.2.3.3 The operator or a flight crew member shall ensure that, where required by the meteorological service provider in consultation with users, the aerodrome meteorological office concerned is notified:

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

19.2.3.4 The notification to the aerodrome meteorological office, of individual flights shall contain the following information except that, in the case of scheduled flights, the requirement for some or all of this information may be waived by agreement between the aerodrome meteorological office and the operator concerned:

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

### 19.2.4 PROVISION OF AIR NAVIGATION SERVICES (MET)

#### 19.2.4.1 Requirements for the provision of air navigation services (MET)

A person shall not provide air navigation services (MET) unless:

- (a) he is designated to do so or is approved by the CASAS issued under these Regulations; and
- (b) the services are provided in accordance with:
  - (i) the requirements specified by the CASAS in the applicable CARS Parts or any other publication of the CASAS; and
  - (ii) the procedures specified in the Manual of Air Navigations Service Operations (MANSOPs).

**19.2.4.2 Application to provide air navigation services (MET)**

A person or company wishing to provide air navigation services shall make an application in a form specified by the CASAS and such application shall be accompanied by:

- (a) the applicant's Manual of Air Navigation Service Operations (MANSOPs) Provided under CARS Part 19.2.4.8.1 of these Regulations for approval;
- (b) a written statement setting out the services and locations at which they shall be provided
- (c) the quality management system manual;
- (d) the procedures to meet the requirements of the Civil Aviation Regulations Suriname,
- (e) a written statement on financial capability to provide the service;
- (f) the insurance policy in force in relation to the services provided; and.
- (g) fees as specified by the Authority.

**19.2.4.3 Designation of Air Navigation Service Provider (MET) and issuance of approval.**

- (1) The Authority shall, before issuing an approval, or designating an Air Navigation Service Provider (ANSP), (MET) be satisfied that:
  - (a) the personnel of the applicant are adequate in number and have the necessary competency to provide the service;
  - (b) the MANSOPs prepared and submitted with the application contains all the relevant information
  - (c) the facilities, services and equipment are established in accordance with these Regulations;
  - (d) the operating procedures make satisfactory provision for the safety of aircraft;
  - (e) an approved quality management system is in place;
  - (f) the applicant has approved procedures to meet the requirements of the Civil Aviation Regulations Suriname (CARS)
  - (g) the applicant has financial capability to provide the service; and
  - (h) the applicant has insurance policy in force in relation to the services provided.
- (2) Subject to the CARS, the CASAS may set any other conditions as may be deemed necessary.
- (3) The provision of air navigation services (MET) shall be subject to compliance with these Regulations and any other condition as may be specified or notified by the CASAS.
- (4) The CASAS may refuse to permit any person or company or grant approval to an applicant, and where the CASAS refuses, it shall notify the person, company or applicant in writing, of the reasons for the refusal, not later than fourteen days after making that decision.

**19.2.4.4 Format of approval.**

Any approval shall be in written format and shall include the following information:



- (a) the ANSP's name and physical and mailing address of its principal place of business;
- (b) the type of services to be provided;
- (c) the location of services to be provided;
- (d) for air traffic service the service to be provided within a particular airspace or controlled aerodrome designated to the provider by the Authority;
- (e) conditions of approval; and
- (f) effective and expiry dates of the approval.

#### 19.2.4.5 Transfer of designation or approval.

A designation or approval to provide air navigation services issued under these Regulations shall not be transferable.

#### 19.2.4.6 Suspension, variation and cancellation of approvals

- (1) The CASAS may, suspend provisionally, pending further investigation, any approval issued under these Regulations, if it considers that
  - a) a relevant provision of these Regulations, or a condition in the certificate, has not been or is not being complied with;
  - b) false or materially incorrect information was given to the CASAS in the application for the approval; or
  - c) it is in the public interest to do so.
- (2) The CASAS may, upon the completion of an investigation which has shown sufficient ground to the Authority's satisfaction suspend, vary or cancel any approval issued under these Regulations.

#### 19.2.4.7 Register of Air Navigation Services providers (MET)

- (1) The CASAS shall keep and maintain a register showing:
  - (a) name of the ANSP;
  - (b) date of issue or renewal of the approval;
  - (c) type of service offered by the ANSP;
  - (d) expiry date of the approval;
  - (e) date of variation, suspension or cancellation of the approval, if applicable;
  - (f) physical and postal address of the holder of the ANSP; and
  - (g) any other particulars as may be determined by the CASAS.
- (2) Any changes in the particulars recorded shall be entered in the register by the CASAS.
- (3) The register shall be a public document and any particular entered may be obtained upon payment of such a fee as may be specified by the CASAS.

**19.2.4.8 MANUAL OF AIR NAVIGATION SERVICES OPERATIONS****19.2.4.8.1 Manual of Air Navigation Services Operations (MANSOPS).**

(1) The Manual of Air Navigation Services Operations (MANSOPS) submitted under these Regulations shall be:

- (a) type written;
- (b) signed by the service provider;
- (c) in a format that is easy to revise and includes a list of effective pages; and
- (d) organised in a manner that facilitates evaluation and approval processes.

(2) An ANSP shall keep at least one approved copy of the manual at the principal place of business.

**19.2.4.8.2 Contents of MANSOPS**

A Manual of Air Navigation Service Operations (MANSOPS) shall contain all information and instructions necessary to enable the personnel of an air navigation service provider to perform their duties and in particular shall include:

- (a) introduction;
- (b) management organisation;
- (c) services to be provided;
- (d) personnel requirements and their responsibilities;
- (e) training and performance assessment of staff and how that information is tracked;
- (f) Quality Management System;
- (g) contingency plans developed for part or total system failure;
- (h) compliance with the Civil Aviation Regulations Suriname (CARS) as required;
- (i) facilities and equipment and how they are installed and maintained;
- (j) fault and defect reporting;
- (k) maintenance of documents and records;
- (l) facility operations and maintenance plan and procedures;
- (m) search and rescue responsibilities and coordination, operations, plan and procedures;
- (n) the proposed hours of service;
- (o) systems and procedures in the provision of air navigation services; and
- (p) any other information requested by the CASAS.

**19.2.4.8.3 Accuracy of MANSOPS**

- (1) For the purposes of maintaining the accuracy of the information in the MANSOPs, the:
  - (a) ANSP (MET) shall whenever necessary, amend the manual; or
  - (b) CASAS may issue a written directive requiring the holder of a certificate to amend the manual.
- (2) Notwithstanding sub-regulation (1), the ANSP shall submit the proposed amendment to the CASAS for approval, before the manual is amended.

**19.2.4.9 AIR NAVIGATION SERVICES****19.2.4.9.1 Air Navigation Services Provider**

The CASAS shall designate a service provider in accordance with these Regulations to provide:

- (a) air traffic services;
- (b) communication, navigation and surveillance systems;
- (c) meteorological services for air navigation;
- (d) aeronautical search and rescue coordination;
- (e) aeronautical information services, aeronautical maps and charts; or
- (f) for the construction of visual and instrument flight procedures.

**19.2.4.9.2 Air Navigation Services facilities and standard systems**

A designated air navigation service provider shall:

- (a) provide in the designated portion of airspace and aerodromes, facilities for the provision of air navigation services; and
- (b) adopt and put into operation the appropriate standard systems, operational practices and rules as specified by the CASAS.

**19.2.4.9.3 Approval of Air Navigation Services facilities.**

A person shall not install, maintain and operate air navigation service facilities in the designated airspaces and aerodromes without approval of the Authority.

**19.2.4.9.4 Safety inspections on Air Navigation Services**

- (1) The CASAS shall carry out safety inspections of air navigation facilities, services, documents and records of the air navigation service provider which may be necessary to determine compliance with these Regulations.
- (2) The safety inspections shall be carried out in accordance with the requirements specified by the CASAS.
- (3) The CASAS may impose operating restrictions or sanctions on the operations of an ANSP in the event of nonconformance with the approval requirements or any unresolved safety concerns.

**19.2.4.9.5 Access to air navigation facilities.**

An inspector of the CASAS shall have unrestricted access to the facilities, installations, records and documents of the air navigation services and the air navigation meteorological service provider to determine compliance with these Regulations.

**19.2.4.9.6 Production of documents.**

An ANSP shall produce any relevant documents under its possession if requested by an authorised person within seventy-two hours of such request.

**19.2.4.9.7 Air Navigation Services contingency plan**

- (1) An ANSP shall develop and maintain contingency plans for implementation in the event of disruption or potential disruption, of air navigation services in the airspace for which the ANSP is responsible.
- (2) The ANSP shall liaise with other air navigation service providers in adjacent or contiguous airspaces while developing contingency plans.
- (3) The contingency plan shall include :
  - (a) the actions to be taken by the ANSP's personnel responsible for providing the service;
  - (b) possible alternative arrangements for providing the service; and
  - (c) the arrangements for resuming normal operations for the service.
- (4) The contingency plan shall be developed in accordance with the requirements specified by the CASAS.

**19.2.4.9.8 Alternative designated service provider.**

- (1) The CASAS may, when considered necessary and in the public interest, designate an alternative service provider for a specified period to provide air navigation services.

**19.2.4.9.9 Units of measurement**

The units of measurement used in air and ground operations shall be as specified by the CASAS.

**19.3 GLOBAL SYSTEMS, SUPPORTING CENTRES AND METEOROLOGICAL OFFICES**

*Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 2 of Annex 3*

**19.3.1 World area forecast system**

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

**19.3.2 World area forecast centers**

19.3.2.1 Suriname, having accepted the responsibility for providing a world area forecast centre (WAFS) within the framework of the WAFS, shall arrange for that centre:

a) to prepare gridded global forecasts of:

- 1) upper wind;
- 2) upper-air temperature and humidity;
- 3) geopotential altitude of flight levels;
- 4) flight level and temperature of tropopause;
- 5) direction, speed and flight level of maximum wind;
- 6) cumulonimbus clouds;
- 7) icing; and
- 8) turbulence

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

c) to issue the forecasts referred to in a) and b) in digital form to meteorological authorities and other users, as approved by the Contracting State on advice from the meteorological authority;

d) to receive information concerning the release of radioactive materials into the atmosphere from its associated World Meteorological Organization (WMO) regional specialized meteorological centre (RSMC) for the provision of transport model products for radiological environmental emergency response, in order to include the information in SIGWX forecasts; and

e) to establish and maintain contact with volcanic ash advisory centres (VAACs) for the exchange of information on volcanic activity in order to coordinate the inclusion of information on volcanic eruptions in SIGWX forecasts.

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

*Note.— Back-up procedures to be used in case of interruption of the operation of a WAFC are updated by the Meteorology Panel (METP) as necessary; the latest revision can be found on the ICAO METP website.*

### 19.3.3 Aerodrome meteorological offices

19.3.3.1 The meteorological service provider shall establish one or more aerodrome and/or other meteorological offices which shall be adequate for the provision of the meteorological service required to satisfy the needs of air navigation.

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

- a) prepare and/or obtain forecasts and other relevant information for flights with which it is concerned; the extent of its responsibilities to prepare forecasts shall be related to the local availability and use of en-route and aerodrome forecast material received from other offices;
- b) prepare and/or obtain forecasts of local meteorological conditions
- c) maintain a continuous survey of meteorological conditions over the aerodromes for which it is designated to prepare forecasts;
- d) provide briefing, consultation and flight documentation to flight crew members and/or other flight operations personnel;
- e) supply other meteorological information to aeronautical users;
- f) display the available meteorological information;

- g) exchange meteorological information with other aerodrome meteorological offices; and
- h) supply information received on pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud, to its associated air traffic services unit, aeronautical information service unit and meteorological watch office (MWO) as agreed between the meteorological, aeronautical information service and ATS authorities concerned.

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

19.3.3.4 For an aerodrome without an aerodrome meteorological office located at the aerodrome:

- a) the meteorological authority concerned shall designate one or more meteorological office (s) to supply meteorological information as required; and
- b) the competent authorities shall establish means by which such information can be supplied to the aerodromes concerned.

#### 19.3.4 Meteorological watch offices

19.3.4.1 An Air Navigation Service Provider, having accepted the responsibility for providing air traffic services within a flight information region (FIR) or a control area (CTA), shall establish, in accordance with regional air navigation agreement, one or more MWOs, or arrange for another Contracting State to do so.

*Note.— Guidance on the bilateral or multilateral arrangements between Contracting States for the provision of MWO services, including for cooperation and delegation, can be found in the Manual of Aeronautical Meteorological Practice (Doc 8896).*

19.3.4.2 A meteorological watch office shall:

- a) maintain continuous watch over meteorological conditions affecting flight operations within its area of responsibility;
- b) prepare SIGMET and other information relating to its area of responsibility;
- c) supply SIGMET information and, as required, other meteorological information to associated air traffic services units;
- d) disseminate SIGMET information;
- e) when required by regional air navigation agreement, in accordance with 19.7.2.1:
  - 1) prepare AIRMET information related to its area of responsibility;
  - 2) supply AIRMET information to associated air traffic services units; and
  - 3) disseminate AIRMET information;
- f) supply information received on pre-eruption volcanic activity, a volcanic eruption and volcanic ash cloud for which a SIGMET has not already been issued, to its associated ACC/FIC, as agreed between the meteorological and ATS authorities concerned, and to its associated VAAC as determined by regional air navigation agreement; and
- g) 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

meteorological and ATS authorities concerned, and to aeronautical information service units, as agreed between the meteorological and appropriate civil aviation authorities concerned. The information shall comprise location, date and time of the release, and forecast trajectories of the radioactive materials.

Note.— The information is provided by RSMCs for the provision of transport model products for radiological environmental emergency response, at the request of the delegated authority of the State in which the radioactive material was released into the atmosphere, or the International Atomic Energy Agency (IAEA). The information is sent by the RSMC to a single contact point of the national meteorological service in each State. This contact point has the responsibility of redistributing the RSMC products within the State concerned. Furthermore, the information is provided by IAEA to RSMC co-located with VAAC London (designated as the focal point) which in turn notifies the ACCs/FICs concerned about the release.

19.3.4.3 The boundaries of the area over which meteorological watch is to be maintained by an MWO should be coincident with the boundaries of an FIR or a CTA or a combination of FIRs and/or CTAs.

19.3.4.4 An MWO should coordinate SIGMET with neighbouring MWO(s), especially when the enroute weather phenomenon extends or is expected to extend beyond the MWO's specified area of responsibility, in order to ensure the provision of harmonized SIGMET.

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

### 19.3.5 Volcanic ash advisory centres

19.3.5.1 An ANSP, having accepted the responsibility for providing a VAAC within the framework of the international airways volcano watch, shall arrange for that centre to respond to a notification that a volcano has erupted or is expected to erupt, or that volcanic ash is reported in its area of responsibility, by:

a) monitoring relevant geostationary and polar-orbiting satellite data and, where available, relevant ground-based and airborne data, to detect the existence and extent of volcanic ash in the atmosphere in the area concerned;

*Note.— Relevant ground-based and airborne data include data derived from Doppler weather radar, ceilometers, lidar and passive infrared sensors.*

b) activating the volcanic ash numerical trajectory/dispersion model in order to forecast the movement of any ash "cloud" which has been detected or reported;

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

c) issuing advisory information regarding the extent and forecast movement of the volcanic ash "cloud" to:

- 1) MWOs, ACCs and FICs serving FIRs in its area of responsibility which may be affected;
- 2) other VAACs whose areas of responsibility may be affected;
- 3) WAFCS, international OPMET databanks, international NOTAM offices, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services; and
- 4) operators requiring the advisory information through the AFTN address provided specifically for this purpose; and

*Note.— The AFTN address to be used by the VAACs is given in the Handbook on the International Airways Volcano Watch (IAVW) — Operational Procedures and Contact List (Doc 9766) which is available on the ICAO website.*

- d) issuing updated advisory information to the MWOs, ACCs, FICs and VAACs referred to in c), as necessary, but at least every six hours until such time as:
- 1) the volcanic ash “cloud” is no longer identifiable from satellite data and, where available, ground-based and airborne data;
  - 2) no further reports of volcanic ash are received from the area; and
  - 3) no further eruptions of the volcano are reported.

19.3.5.2 VAACs shall maintain a 24-hour watch.

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

*Note.— Back-up procedures to be used in case of interruption of the operation of a VAAC are included in Doc 9766.*

### 19.3.6 State volcano observatories

Contracting States with active or potentially active volcanoes shall arrange that State volcano observatories monitor these volcanoes and when observing:

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

*Note 1.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.*

*Note 2.— Doc 9766 contains guidance material about active or potentially active volcanoes.*

### 19.3.7 Tropical cyclone advisory centers

When having accepted, by regional air navigation agreement, the responsibility for providing a TCAC on behalf of Suriname, the Meteorological Service Provider shall arrange for that centre to:

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



### 19.3.8 Space weather centres

19.3.8.1 A Contracting State, having accepted the responsibility for providing a space weather centre (SWXC), shall arrange for that centre to monitor and provide advisory information on space weather phenomena in its area of responsibility by arranging for that centre to:

a) monitor relevant ground-based, airborne and space-based observations to detect, and predict when possible, the existence of space weather phenomena that have an impact in the following areas:

1) high frequency (HF) radio communications;

2) communications via satellite;

3) GNSS-based navigation and surveillance; and

4) radiation exposure at flight levels;

b) issue advisory information regarding the extent, severity and duration of the space weather phenomena that have an impact referred to in a);

c) supply the advisory information referred to in b) to:

1) area control centres, flight information centres and aerodrome meteorological offices in its area of responsibility which may be affected;

2) other SWXCs; and

3) international OPMET databanks, international NOTAM offices and aeronautical fixed service Internet-based services.

19.3.8.2 SWXC shall maintain a 24-hour watch.

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

*Note.— Guidance on the provision of space weather advisory information, including the ICAO-designated provider(s) of space weather advisory information, is provided in the Manual on Space Weather Information in Support of International Air Navigation (Doc 10100).*

## 19.4 METEOROLOGICAL OBSERVATIONS AND REPORTS

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

### 19.4.1 Aeronautical meteorological stations and observations

19.4.1.1 Meteorological service provider shall establish, at aerodromes in its territory, such aeronautical meteorological stations as it determines to be necessary. An aeronautical meteorological station may be a separate station or may be combined with a synoptic station.

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

19.4.1.2 A Meteorological service provider shall establish, or arrange for the establishment of, aeronautical meteorological stations on offshore structures or at other points of significance in support of helicopter operations to offshore structures, if required by regional air navigation agreement.

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

19.4.1.4 A Meteorological service provider shall be inspected by CASAS at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly, and that the exposure of the instruments has not changed significantly.

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

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

*Note 1.— Categories of precision approach and landing operations are defined CARS part 8.*

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

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

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

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

## 19.4.2 Agreement between air traffic services authorities and meteorological authorities

19.4.2.1 An agreement between the meteorological service provider and the appropriate ATS provider shall be established to cover, amongst other things:

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

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

## 19.4.3 Routine observations and reports

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

19.4.3.2 Reports of routine observations shall be issued as:

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

*Note.— Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local routine report, in accordance with CARS part 18, 18.4.3.6.1 g).*

19.4.3.3 At aerodromes that are not operational throughout 24 hours in accordance with 19.4.3.1, METAR shall be issued prior to the aerodrome resuming operations in accordance with regional air navigation agreement.

## 19.4.4 Special observations and reports

19.4.4.1 A list of criteria for special observations shall be established by the meteorological service provider, in consultation with the appropriate ATS provider, operators and others concerned.

19.4.4.2 Reports of special observations shall be issued as:

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

*Note.— Meteorological information used in ATIS (voice-ATIS and D-ATIS) is to be extracted from the local special report, in accordance with CARS part 18, 18.4.3.6.1 g).*

19.4.4.3 At aerodromes that are not operational throughout 24 hours in accordance with 19.4.3.1, following the resumption of the issuance of METAR, SPECI shall be issued, as necessary.

### 19.4.5 Contents of reports

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

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

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

19.4.5.2 In addition to elements listed under 19.4.5.1 a) to k), local routine reports, local special reports, METAR and SPECI should contain supplementary information to be placed after element k).

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

### 19.4.6 Observing and reporting meteorological elements

#### 19.4.6.1 Surface wind

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

19.4.6.1.2 When local routine and special reports are used for departing aircraft, the surface wind observations for these reports shall 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 shall be representative of the touchdown zone.

19.4.6.1.3 For METAR and SPECI, the surface wind observations shall 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.

#### 19.4.6.2 Visibility

19.4.6.2.1 The visibility as defined in CARS Part 1 shall be measured or observed, and reported in metres or kilometres

*Note.*— Guidance on the conversion of instrument readings into visibility is given in Attachment D of Annex 3.

19.4.6.2.2 When local routine and special reports are used for departing aircraft, the visibility observations for these reports shall be representative of conditions along the runway; when local routine and special reports are

used for arriving aircraft, the visibility observations for these reports shall be representative of the touchdown zone of the runway.

19.4.6.2.3 For METAR and SPECI, the visibility observations shall be representative of the aerodrome.

### 19.4.6.3 Runway visual range

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

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

19.4.6.3.2 Runway visual range as defined in CARS Part 1 shall be assessed on all runways intended for use during periods of reduced visibility, including:

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

Note.— Precision approach runways are defined in CARS Part 12 ,(Annex 14, Volume I, Chapter 1, under "Instrument runway". )

19.4.6.3.3 The runway visual range, assessed in accordance with 19.4.6.3.1 and 19.4.6.3.2, shall be reported in meters throughout periods when either the visibility or the runway visual range is less than 1 500 m.

19.4.6.3.4 Runway visual range assessments shall be representative of:

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

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

### 19.4.6.4 Present weather

19.4.6.4.1. The present weather occurring at the aerodrome shall be observed and reported as necessary. The following present weather phenomena shall 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).

19.4.6.4.2 For local routine and special reports, the present weather information shall be representative of conditions at the aerodrome.

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

### 19.4.6.5 Clouds

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

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

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

#### 19.4.6.6 Air temperature and dew-point temperature

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

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

#### 19.4.6.7 Atmospheric pressure

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

#### 19.4.6.8 Supplementary information

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

### 19.4.7 Reporting of meteorological information from automatic observing systems

19.4.7.1 METAR and SPECI from automatic observing systems shall be used by States in a position to do so during non-operational hours of the aerodrome, and during operational hours of the aerodrome as determined by the meteorological service provider in consultation with users based on the availability and efficient use of personnel.

Note.— Guidance on the use of automatic meteorological observing systems is given in Doc 9837.

19.4.7.2 Local routine and special reports from automatic observing systems shall be used by States in a position to do so during operational hours of the aerodrome as determined by the meteorological service provider in consultation with users based on the availability and efficient use of personnel.

19.4.7.3 Local routine reports, local special reports, METAR and SPECI from automatic observing systems shall be identified with the word "AUTO".

### 19.4.8 Observations and reports of volcanic activity

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

- a) message type, VOLCANIC ACTIVITY REPORT;
- b) station identifier, location indicator or name of station;

- c) date/time of message;
- d) location of volcano and name if known; and
- e) concise description of event including, as appropriate, level of intensity of volcanic activity, occurrence of an eruption and its date and time and the existence of a volcanic ash cloud in the area together with direction of ash cloud movement and height.

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

## 19.5 AIRCRAFT OBSERVATIONS AND REPORTS

*Note: Technical specifications and detailed criteria related to this chapter are given in Appendix 4 of Annex 3*

### 19.5.1 Obligations of States

Meteorological service provider shall arrange, according to the provisions of this chapter, for observations to be made by aircraft operating on air routes and for the recording and reporting of these observations.

### 19.5.2 Types of aircraft observations

The following aircraft observations shall be made:

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

### 19.5.3 Routine aircraft observations - designation

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

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

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

19.5.3.2 For helicopter operations to and from aerodromes on offshore structures, routine observations shall be made from helicopters at points and times as agreed between the meteorological authorities and the helicopter operators concerned.

19.5.3.3 In the case of air routes with high-density air traffic (e.g. organized tracks), an aircraft from among the aircraft operating at each flight level shall be designated, at approximately hourly intervals, to make routine observations in accordance with 19.5.3.1, 19.5.3.1.1. The designation procedures shall be in accordance with regional air navigation agreement.

19.5.3.4 In the case of the requirement to report during the climb-out phase, an aircraft shall be designated, at approximately hourly intervals, at each aerodrome to make routine observations in accordance with 19.5.3.1 and 19.5.3.1.1.

### 19.5.4 Routine aircraft observations - exemptions

Aircraft not equipped with air-ground data link shall be exempted from making routine aircraft observations. When voice communications are used, an aircraft shall be exempted from making the routine observations specified in 19.5.3.1, 19.5.3.1.1 when:

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

#### 19.5.5 Special aircraft observations

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

- a) moderate or severe turbulence; or
- b) moderate or severe icing; or
- c) severe mountain wave; or
- d) thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or
- e) thunderstorms, with hail, that are obscured, embedded, widespread or in squall lines; or
- f) heavy dust storm or heavy sandstorm; or
- g) volcanic ash cloud; or
- h) pre-eruption volcanic activity or a volcanic eruption.  
Note.— Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.
- i) as of 5 November 2020, runway braking action encountered is not as good as reported

#### 19.5.6 Other non-routine aircraft observations

When other meteorological conditions not listed under 19.5.5, e.g. wind shear, are encountered and which, in the opinion of the pilot-in-command, may affect the safety or markedly affect the efficiency of other aircraft operations, the pilot-in-command shall advise the appropriate air traffic services unit as soon as practicable.

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

#### 19.5.7 Reporting of aircraft observations during flight

19.5.7.1. Aircraft observations shall be reported by air-ground data link. Where air-ground data link is not available or appropriate, special and other non-routine aircraft observations during flight shall be reported by voice communications.

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

19.5.7.3. Aircraft observations shall be reported as air-reports.

#### 19.5.8 Relay of air-reports by ATS units

The meteorological service provider concerned shall make arrangements with the appropriate ATS provider to ensure that, on receipt by the ATS units of:

- a) special air-reports by voice communications, the ATS units relay them without delay to their associated meteorological watch office; and
- b) routine and special air-reports by data link communications, the air traffic services units relay them without delay to their associated meteorological watch office, the WAFCs and the centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.



### 19.5.9 Recording and post-flight reporting of aircraft observations of volcanic activity

Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form.

A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of the meteorological authority concerned, could be affected by volcanic ash clouds.

## 19.6 FORECASTS

*Note.*— *Technical specifications and detailed criteria related to this chapter are given in Appendix 5 of Annex 3.*

### 19.6.1 Use of forecasts

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

### 19.6.2 Aerodrome forecasts

19.6.2.1 An aerodrome forecast shall be prepared by in accordance with regional air navigation agreement, by the aerodrome meteorological office designated by the meteorological service provider concerned.

*Note.*— The aerodromes for which aerodrome forecasts are to be prepared and the period of validity of these forecasts are listed in the relevant facilities and services implementation document (FASID).

19.6.2.2 An aerodrome forecast shall 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.

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

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

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

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

19.6.2.4 Aerodrome meteorological offices preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly. The length of the forecast messages and the number of changes indicated in the forecast shall be kept to a minimum.

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

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

19.6.2.6 *The period of validity of a routine TAF shall be not less than 6 hours and not more than 30 hours; the period of validity shall be determined by regional air navigation agreement. Routine TAF valid for less than 12 hours shall be issued every 3 hours and those valid for 12 to 30 hours shall be issued every 6 hours.*

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

### 19.6.3 Landing forecasts

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

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

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

### 19.6.4 Forecasts for take-off

19.6.4.1 A forecast for take-off shall be prepared by the aerodrome meteorological office designated by the meteorological service provider concerned as agreed between the meteorological service provider and the operators concerned.

19.6.4.2 A forecast for take-off shall refer to a specified period of time and shall 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.

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

19.6.4.4 Aerodrome meteorological offices preparing forecasts for take-off shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly.

### 19.6.5 Area forecasts for low-level flights

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

19.6.5.2 When the density of traffic operating below flight level 100 warrants the issuance of AIRMET information in accordance with 19.7.2.1, area forecasts for such operations shall be prepared in a format agreed upon between the meteorological authorities concerned. When abbreviated plain language is used, the forecast shall be prepared as a GAMET area forecast, employing approved ICAO abbreviations and numerical values; when chart form is used, shall be prepared as a combination of forecast of upper wind and upper-air temperature, and of SIGWX phenomena. The area forecasts shall be issued to cover the layer between the ground and flight level 100 (or up to flight level 150 in mountainous areas, or higher, where necessary) and shall contain information on en-route

weather phenomena hazardous to low-level flights, in support of the issuance of AIRMET information, and additional information required by low-level flights.

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

## 19.7 SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

*Note.— Technical specifications and detailed criteria related to this chapter are given in Appendix 6 of Annex 3*

### 19.7.1 SIGMET information

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

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

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

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

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

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

### 19.7.2 AIRMET information

19.7.2.1 AIRMET information shall be issued by a meteorological watch office in accordance with regional air navigation agreement, taking into account the density of air traffic operating below flight level 100. AIRMET information shall give a concise description in abbreviated plain language concerning the occurrence and/or expected occurrence of specified en-route weather phenomena, which have not been included in Section I of the area forecast for low-level flights issued in accordance with Chapter 19.6, 19.6.5 and which may affect the safety of low-level flights, and of the development of those phenomena in time and space.

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

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

### 19.7.3 Aerodrome warnings

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

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

### 19.7.4 Wind shear warnings and alerts

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

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

19.7.4.2 *Wind shear warnings for arriving aircraft and/or departing aircraft shall 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 shall be defined locally for each aerodrome, as agreed between the meteorological authority, the appropriate ATS authority and the operators concerned.*

19.7.4.3 At aerodromes where wind shear is detected by automated, ground-based, wind shear remote-sensing or detection equipment, wind shear alerts generated by these systems shall be issued. Wind shear alerts shall give concise, up-to-date information related to the observed existence of wind shear involving a headwind/tailwind change of 7.5 m/s (15kt) or more which could adversely affect aircraft on the final approach path or initial take-off path and aircraft on the runway during the landing roll or take-off run.

19.7.4.4 *Wind shear alerts shall be updated at least every minute. The wind shear alert shall be cancelled as soon as the headwind/tailwind change falls below 7.5 m/s (15 kt).*

## 19.8 AERONAUTICAL CLIMATOLOGICAL INFORMATION

*Note. Technical specifications and detailed criteria related to this chapter are given in Appendix 7 of Annex 3*

### 19.8.1 General provisions

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

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

*Note.— Climatological data required for aerodrome planning purposes are set out in CARS Part 12, (Annex 14, Volume I, 3.1.4 and Attachment A. )*

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

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

#### **19.8.2 Aerodrome climatological tables**

Meteorological service provider shall make arrangements for collecting and retaining the necessary observational data and have the capability:

- a) to prepare aerodrome climatological tables for each regular and alternate international aerodrome within its territory; and
- b) to make available such climatological tables to an aeronautical user within a time period as agreed between the meteorological service provider and the user concerned.

#### **19.8.3 Aerodrome climatological summaries**

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

#### **19.8.4 Copies of meteorological observational data**

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

### **19.9 SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS**

*Note.— Technical specifications and detailed criteria related to this chapter are given in IS 19.9.*

#### **19.9.1 General provisions**

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

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

19.9.1.2 Meteorological information supplied to operators and flight crew members shall cover the flight in respect of time, altitude and geographical extent. Accordingly, the information shall relate to appropriate fixed times, or periods of time, and shall extend to the aerodrome of intended landing, also covering the meteorological

conditions expected between the aerodrome of intended landing and one alternate aerodrome designated by the operator.

19.9.1.3 Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as agreed between the meteorological authority and the operators concerned:

a.) forecasts of :

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

*Note 1.— Forecasts of upper-air humidity and geopotential altitude of flight levels are used only in automatic flight planning and need not be displayed.*

*Note 2.— Forecasts of cumulonimbus clouds, icing and turbulence are intended to be processed and, if necessary, visualized according to the specific thresholds relevant to user operations.*

b. METAR or SPECI (including trend forecasts as issued in accordance with regional air navigation agreement) for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;

c. TAF or amended TAF for the aerodromes of departure and intended landing, and for take-off, en-route and destination alternate aerodromes;

d. forecasts for take-off;

e. SIGMET information and appropriate special air-reports, relevant to the whole route;

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

f. volcanic ash and tropical cyclone advisory information relevant to the whole route;

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

h. aerodrome warnings for the local aerodrome;

i. meteorological satellite images; and

j. ground-based weather radar information.

19.9.1.4 Forecasts listed under 19.9.1.3 a) shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between the meteorological authority and the operator concerned.

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

19.9.1.6 Charts generated from the digital forecasts provided by the WAFCs shall be made available, as

required by operators, for fixed areas of coverage as shown in IS 19.9.1.6 figures A8-1, A8-2 and A8-3.

19.9.1.7 When forecasts of upper wind and upper-air temperature listed under 19.9.1.3 a) 1) are supplied in chart form, they shall be fixed time prognostic charts for flight levels as specified in Appendix 2 of Annex 3, 1.2.2a. When forecasts of SIGWX phenomena listed under 19.9.1.3 a) 6) are supplied in chart form they shall be fixed time prognostic charts for an atmospheric layer limited by flight levels as specified Appendix 2 of Annex 3, 1.3.2 and Appendix 5 of Annex 3, 4.3.2.

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

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

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

## 19.9.2 Briefing, consultation and display

*Note. The requirements for the use of automated pre-flight information systems in providing briefing, consultation and display are given in 19.9.4.*

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

19.9.2.2 Meteorological information used for briefing, consultation and display shall include any or all of the information listed in 19.9.1.3.

19.9.2.3 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 shall be drawn to the divergence. The portion of the briefing dealing with the divergence shall be recorded at the time of briefing and this record shall be made available to the operator.

19.9.2.4 The required briefing, consultation, display and/or flight documentation shall normally be provided by the meteorological office associated with the aerodrome of departure. At an aerodrome where these services are not available, arrangements to meet the requirements of flight crew members shall be as agreed upon between the meteorological authority and the operator concerned. In exceptional circumstances, such as an undue delay, the aerodrome meteorological office associated with the aerodrome shall provide or, if that is not practicable, arrange for the provision of a new briefing, consultation and/or flight documentation as necessary.

19.9.2.5 *The flight crew member and/or other flight operations personnel for whom briefing, consultation and/or flight documentation has been requested shall 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 shall provide those services by telephone or other suitable telecommunications facilities.*

### 19.9.3 Flight documentation

Note.— The requirements for the use of automated pre-flight information systems in providing flight documentation are given in 19.9.4.

19.9.3.1 Flight documentation to be made available shall comprise information listed under 19.9.1.3 a), 1) and 6), b), c), e),f) and, if appropriate, g). However, when agreed between the meteorological authority and operator concerned, flight documentation for flights of two hours' duration or less, after a short stop or turnaround shall be limited to the information operationally needed, but in all cases the flight documentation shall at least comprise information on 19.9.1.3 b), c), e),f) and, if appropriate, g and k).

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

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

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

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

19.9.4.1 Where the meteorological authority uses automated pre-flight information systems to supply and display meteorological information to operators and flight crew members for self-briefing, flight planning and flight documentation purposes, the information supplied and displayed shall comply with the relevant provisions in 19.9.1 to 19.9.3 inclusive.

19.9.4.2 *Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel concerned shall be as agreed between the meteorological authority and the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with CARS Part 20, 20.2.1.1 c).*

*Note.— The meteorological and aeronautical information services information concerned is specified in 19.9.1 to 19.9.3 and IS 19.9 and in the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066), 5.5, respectively.*

19.9.4.3 Where automated pre-flight information systems are used to provide for a harmonized, common point of access to meteorological information and aeronautical information services information by operators, flight crew members and other aeronautical personnel, the meteorological authority shall remain responsible for the quality



control and quality management of meteorological information provided by means of such systems in accordance with Chapter 19.2, 19.2.2.2.

*Note.— The responsibilities relating to aeronautical information services information and the quality assurance of the information are given in CARS Part 20, Chapters 20.1, 20.2 and 20.3.*

#### **19.9.5 Information for aircraft in flight**

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

19.9.5.2 Meteorological information for use by aircraft in flight shall be supplied to air traffic services units in accordance with the specifications of 19.10.

19.9.5.3 Meteorological information shall be supplied through D-VOLMET or VOLMET broadcasts in accordance with the specifications of 19.11.

### **19.10 INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES, AERONAUTICAL INFORMATION SERVICES**

*Note. Technical specifications and detailed criteria related to this chapter are given in Appendix 9 of Annex 3*

#### **19.10.1 Information for air traffic services units**

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

19.10.1.2 *An aerodrome meteorological office shall be associated with an aerodrome control tower or approach control unit for the provision of meteorological information.*

19.10.1.3 A meteorological watch office shall be associated with a flight information centre or an area control centre for the provision of meteorological information.

19.10.1.4 Where, owing to local circumstances, it is convenient for the duties of an associated aerodrome meteorological office or meteorological watch office to be shared between two or more aerodrome meteorological offices or meteorological watch offices, the division of responsibility shall be determined by the meteorological service provider in consultation with the appropriate ATS provider.

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

#### **19.10.2 Information for search and rescue services units**

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

### 19.10.3 Information for aeronautical information services units

The meteorological service provider in coordination with the appropriate civil aviation service provider, shall arrange for the supply of up-to-date meteorological information to relevant aeronautical information services units, as necessary, for the conduct of their functions.

## 19.11 REQUIREMENTS FOR AND USE OF COMMUNICATIONS

*Note 1.— Technical specifications and detailed criteria related to this chapter are given in Appendix 10 of Annex 3*

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

### 19.11.1 Requirements for communications

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

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

19.11.1.3 Suitable telecommunications facilities shall be made available to permit world area forecast centers to supply the required world area forecast system products to aerodrome meteorological offices, meteorological authorities and other users.

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

19.11.1.5 Telecommunications facilities between aerodrome meteorological offices or meteorological watch offices and flight information centres, area control centres, rescue coordination centres and aeronautical telecommunications stations shall permit:

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

*Note.— In 19.11.1.4 and 19.11.1.5, “approximately 15 seconds” refers to telephony communications involving switchboard operation and “5 minutes” refers to printed communications involving retransmission.*

19.11.1.6 The telecommunications facilities required in accordance with 19.11.1.4 and 19.11.1.5 shall be supplemented, as and where necessary, by other forms of visual or audio communications, for example, closed-circuit television or separate information processing systems.

19.11.1.7 *As agreed between the meteorological service provider and the operators concerned, provision shall be made to enable operators to establish suitable telecommunications facilities for obtaining meteorological information from aerodrome meteorological offices or other appropriate sources.*

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

19.11.1.9 The telecommunications facilities used for the exchange of operational meteorological information shall 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.

Note 1.— Aeronautical fixed service Internet-based services, operated by the world area forecast centres, providing for global coverage are used to support the global exchanges of operational meteorological information.

Note 2.— Guidance material on non-time-critical operational meteorological information and relevant aspects of the public Internet is provided in the Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).

#### **19.11.2 Use of aeronautical fixed service communications and the public Internet — meteorological bulletins**

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

*Note.— Meteorological bulletins containing operational meteorological information authorized for transmission via the aeronautical fixed service are listed in CARS Part 17 (Annex 10, Volume II, Chapter 4,) together with the relevant priorities and priority indicators.*

#### **19.11.3 Use of aeronautical fixed service communications — world area forecast system products**

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

#### **19.11.4 Use of aeronautical mobile service communications**

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

#### **19.11.5 Use of aeronautical data link service - contents of D-VOLMET**

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

*Note.— The requirement to provide METAR and SPECI may be met by the data link-flight information service (D-FIS) application entitled "Data link-aerodrome routine meteorological report (D-METAR) service"; the requirement*

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

#### **19.11.6 Use of aeronautical broadcasting service - contents of VOLMET broadcasts**

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

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

### **19.12 METEOROLOGICAL SERVICE PROVIDER TRAINING PROGRAM**

#### **19.12.1 Training Program**

A meteorological service provider shall establish procedures and programs for the training and assessment of all newly appointed and current technical staff.

#### **19.12.2 The training and education program shall be governed by the following criteria:**

- a) Training and education shall be in accordance to guidelines of WMO;
- b) Aeronautical Meteorological Forecaster (AMF) and Aeronautical Meteorological Technician (AMT) shall have continuing education and training at a minimum frequency of once every 3 years and once every 5 years respectively;
- c) The program shall include a training plan detailing and prioritizing the type of training to be provided in a certain period.

#### **19.12.3 Training Syllabus**

A meteorological service provider shall establish procedures to ensure that the training programs for each course shall be comprehensive and facilitate achievement of training goals through a syllabus, which reflects required competencies. The syllabus must ensure compliance with relevant national and international requirements.

#### **19.12.4 Training Delivery and Assessment**

Training courses for staff of the meteorological service provider shall use a method of delivery consistent with using facilities and instructors, or training officers, with current expertise and identified qualifications appropriate to achieving the goals of the course.

The method of assessment, both theoretical and practical, shall be qualified assessors and appropriate processes and facilities.

#### **19.12.5 Training Records**

Training records of the staff of the Meteorological Service Provider shall be maintained to show what competences technical staff possess, and to show what training has been carried out, and the results of that training.

#### **19.12.6 Refresher Training**

Refresher training for the staff of the Meteorological Service Provider involves periodic training and assessment of individuals performing functions in meteorological services in those competencies (knowledge and skills) which are essential, but infrequently or rarely used. The content and periodicity of refresher training shall be sufficient to ensure competency.

**19.12.7 On-going Training**

The training program shall provide for on-going training of the technical staff of the Meteorological Service Provider, as necessary, to ensure that staff are competent in the use of new or emerging standards, procedures, techniques, facilities and equipment identified as essential to task performance.

**19.12.8 Remedial Training**

The training program for the technical staff of the Meteorological Service Provider shall have a process which identifies deficiencies in knowledge or application, and must have a process to ensure these deficiencies are rectified.

**19.12.9 Qualifications of Trainers and Checkers**

Persons carrying out training and/or checking functions as part of the Meteorological Service Provider's training program shall be appropriately qualified for these functions.

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**CIVIL AVIATION REGULATIONS  
SURINAME**

**PART 19 - IMPLEMENTING STANDARDS**

**VERSION 2.0**

**DATE JULY 2022**

For ease of reference, the number assigned to each implementing standard corresponds to its associated regulation.  
For example, IS: 19.9.1.6 would reflect a standard required in subsection 19.9.1.6

**IS: 19.9 TECHNICAL SPECIFICATIONS RELATED TO SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS**

*Note.— Specifications related to flight documentation (including the model charts and forms) are given in Implemented Standard 19.9*

**1. MEANS OF SUPPLY AND FORMAT OF METEOROLOGICAL INFORMATION**

1.1 Meteorological information shall be supplied to operators and flight crew members by one or more of the following, as agreed between the meteorological authority and the operator concerned, and with the order shown below not implying priorities:

- a) written or printed material, including specified charts and forms;
- b) data in digital form;
- c) briefing;
- d) consultation;
- e) display; or
- f) in lieu of a) to e), by means of an automated pre-flight information system providing self-briefing and flight documentation facilities while retaining access by operators and aircrew members to consultation, as necessary, with the aerodrome meteorological office, in accordance with 5.1.

1.2 The meteorological authority, in consultation with the operator, shall determine:

- a) the type and format of meteorological information to be supplied; and
- b) methods and means of supplying that information.

1.3 *On request by the operator, the meteorological information supplied for flight planning should include data for the determination of the lowest usable flight level.*

**2. SPECIFICATIONS RELATED TO INFORMATION FOR PRE-FLIGHT PLANNING AND IN-FLIGHT REPLANNING****2.1 Format of upper-air gridded information**

Upper-air gridded information supplied by the world area forecast centres (WAFCs) for pre-flight and in-flight replanning shall be in the GRIB code form.

*Note.— The GRIB code form is contained in the Manual on Codes (WMO-No. 306), Volume I.2, Part B — Binary Codes.*

## 2.2 Format of information on significant weather

Information on significant weather supplied by WAFCs for pre-flight and in-flight replanning shall be in the BUFR code form.

*Note.— The BUFR code form is contained in the Manual on Codes (WMO-No. 306), Volume I.2, Part B — Binary Codes.*

## 2.3 Specific needs of helicopter operations

*Meteorological information for pre-flight planning and in-flight replanning by operators of helicopters flying to offshore structures should include data covering the layers from sea level to flight level 100. Particular mention should be made of the expected surface visibility, the amount, type (where available), base and tops of cloud below flight level 100, sea state and sea-surface temperature, mean sea-level pressure, and the occurrence and expected occurrence of turbulence and icing, as determined by regional air navigation agreement.*

# 3. SPECIFICATIONS RELATED TO BRIEFING AND CONSULTATION

## 3.1 Information required to be displayed

*The material displayed should be readily accessible to the flight crew members or other flight operations personnel concerned.*

# 4. SPECIFICATIONS RELATED TO FLIGHT DOCUMENTATION

## 4.1 Presentation of information

4.1.1 The flight documentation related to forecasts of upper wind and upper-air temperature and SIGWX phenomena shall be presented in the form of charts. For low-level flights, alternatively, GAMET area forecasts shall be used.

*Note.— Models of charts and forms for use in the preparation of flight documentation are given in Appendix 1. These models and methods for their completion are developed by the World Meteorological Organization (WMO) on the basis of relevant operational requirements stated by ICAO.*

4.1.2 *The flight documentation related to concatenated route-specific upper wind and upper-air temperature forecasts should be provided as agreed between the meteorological authority and the operator concerned.*

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

4.1.3 METAR and SPECI (including trend forecasts as issued in accordance with regional air navigation agreement), TAF, GAMET, SIGMET, AIRMET and volcanic ash and tropical cyclone advisory information shall be presented in accordance with the templates in Appendices 1, 2, 3, 5 and 6. Such meteorological information received from other meteorological offices shall be included in flight documentation without change.

*Note.— Examples of the form of presentation of METAR/SPECI and TAF are given in Appendix 1.*



4.1.4 *The location indicators and the abbreviations used should be explained in the flight documentation.*

4.1.5 *The forms and the legend of charts included in flight documentation should be printed in English, French, Russian or Spanish. Where appropriate, approved abbreviations should be used. The units employed for each element should be indicated; they should be in accordance with Annex 5.*

## 4.2 Charts in flight documentation

### 4.2.1 Characteristics of charts

4.2.1.1 *Charts included in flight documentation should have a high standard of clarity and legibility and should have the following physical characteristics:*

- a) for convenience, the largest size of charts should be about 42 × 30 cm (standard size A3) and the smallest size should be about 21 × 30 cm (standard size A4). The choice between these sizes should depend on the route lengths and the amount of detail that needs to be given in the charts as agreed between the meteorological authorities and the users concerned;*
- b) major geographical features, such as coastlines, major rivers and lakes should be depicted in a way that makes them easily recognizable;*
- c) for charts prepared by computer, meteorological data should take preference over basic chart information, the former cancelling the latter wherever they overlap;*
- d) major aerodromes should be shown as a dot and identified by the first letter of the name of the city the aerodrome serves as given in Table AOP of the relevant regional air navigation plan;*
- e) a geographical grid should be shown with meridians and parallels represented by dotted lines at each 10° latitude and longitude; dots should be spaced one degree apart;*
- f) latitude and longitude values should be indicated at various points throughout the charts (i.e. not only at the edges); and*
- g) labels on the charts for flight documentation should be clear and simple and should present the name of the world area forecast centre or, for non-world area forecast system (WAFS) products, the originating centre, the type of chart, date and valid time and, if necessary, the types of units used in an unambiguous way.*

4.2.1.2 Meteorological information included in flight documentation shall be represented as follows:

- a) winds on charts shall be depicted by arrows with feathers and shaded pennants on a sufficiently dense grid;
- b) temperatures shall be depicted by figures on a sufficiently dense grid;
- c) wind and temperature data selected from the data sets received from a world area forecast centre shall be depicted in a sufficiently dense latitude/longitude grid; and
- d) wind arrows shall take precedence over temperatures and either shall take precedence over chart background.

4.2.1.3 *For short-haul flights, charts should be prepared covering limited areas at a scale of 1:15 × 10<sup>6</sup> as required.*

#### 4.2.2 Set of charts to be provided

4.2.2.1 The minimum number of charts for flights between flight level 250 and flight level 630 shall include a high-level SIGWX chart (flight level 250 to flight level 630) and a forecast 250 hPa wind and temperature chart. The actual charts provided for pre-flight and in-flight planning and for flight documentation shall be as agreed between meteorological authorities and users concerned.

4.2.2.2 Charts to be provided shall be generated from the digital forecasts provided by the WAFCs whenever these forecasts cover the intended flight path in respect of time, altitude and geographical extent, unless otherwise agreed between the meteorological authority and the operator concerned.

#### 4.2.3 Height indications

In flight documentation, height indications shall be given as follows:

- a) all references to en-route meteorological conditions, such as height indications of upper winds, turbulence or bases and tops of clouds, shall preferably be expressed in flight levels; they may also be expressed in pressure, altitude or, for low-level flights, height above ground level; and
- b) all references to aerodrome meteorological conditions, such as height indications of the bases of clouds, shall be expressed in height above the aerodrome elevation.

### 4.3 Specifications related to low-level flights

#### 4.3.1 In chart form

*Where the forecasts are supplied in chart form, flight documentation for low-level flights, including those in accordance with the visual flight rules, operating up to flight level 100 (or up to flight level 150 in mountainous areas or higher, where necessary), should contain the following as appropriate to the flight:*

- a) *information from relevant SIGMET and AIRMET messages;*
- b) *upper wind and upper-air temperature charts as given in Appendix 5, 4.3.1; and*
- c) *significant weather charts as given in Appendix 5, 4.3.2.*

#### 4.3.2 In abbreviated plain language

*Where the forecasts are not supplied in chart form, flight documentation for low-level flights, including those in accordance with the visual flight rules, operating up to flight level 100 (up to flight level 150 in mountainous areas or higher, where necessary), should contain the following information as appropriate to the flight:*

- a) *SIGMET and AIRMET information; and*
- b) *GAMET area forecasts.*

*Note.— An example of the GAMET area forecast is given in Appendix 5.*

## 5. SPECIFICATIONS RELATED TO AUTOMATED PRE-FLIGHT INFORMATION SYSTEMS FOR BRIEFING, CONSULTATION, FLIGHT PLANNING AND FLIGHT DOCUMENTATION

### 5.1 Access to the systems

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

### 5.2 Detailed specifications of the systems

*Automated pre-flight information systems for the supply of meteorological information for selfbriefing, pre-flight planning and flight documentation should:*

- a) *provide for the continuous and timely updating of the system database and monitoring of the validity and integrity of the meteorological information stored;*
- b) *permit access to the system by operators and flight crew members and also by other aeronautical users concerned through suitable telecommunications means;*
- c) *use access and interrogation procedures based on abbreviated plain language and, as appropriate, ICAO location indicators, and aeronautical meteorological code data-type designators prescribed by WMO, or based on a menu-driven user interface, or other appropriate mechanisms as agreed between the meteorological authority and the operators concerned; and*
- d) *provide for rapid response to a user request for information.*

*Note.— ICAO abbreviations and codes and location indicators are given respectively in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400) and Location Indicators (Doc 7910). Aeronautical meteorological code data-type designators are given in the Manual on the Global Telecommunication System (WMO-No. 386).*

## 6. SPECIFICATIONS RELATED TO INFORMATION FOR AIRCRAFT IN FLIGHT

### 6.1 Supply of information requested by an aircraft in flight

*If an aircraft in flight requests meteorological information, the aerodrome meteorological office or meteorological watch office which receives the request should arrange to supply the information with the assistance, if necessary, of another aerodrome meteorological office or meteorological watch office.*

### 6.2 Information for in-flight planning by the operator

*Meteorological information for planning by the operator for aircraft in flight should be supplied during the period of the flight and should normally consist of any or all of the following:*

- a) *METAR and SPECI (including trend forecasts as issued in accordance with regional air navigation agreement);*

- b) TAF and amended TAF;
- c) SIGMET and AIRMET information and special air-reports relevant to the flight, unless the latter have been the subject of a SIGMET message;
- d) upper wind and upper-air temperature information;
- e) volcanic ash and tropical cyclone advisory information relevant to the flight; and
- f) other meteorological information in alphanumeric or graphical form as agreed between the meteorological authority and the operator concerned.

Note.— Guidance on the display of graphical information in the cockpit is provided in Doc 8896.

#### IS. 19.9.1.6

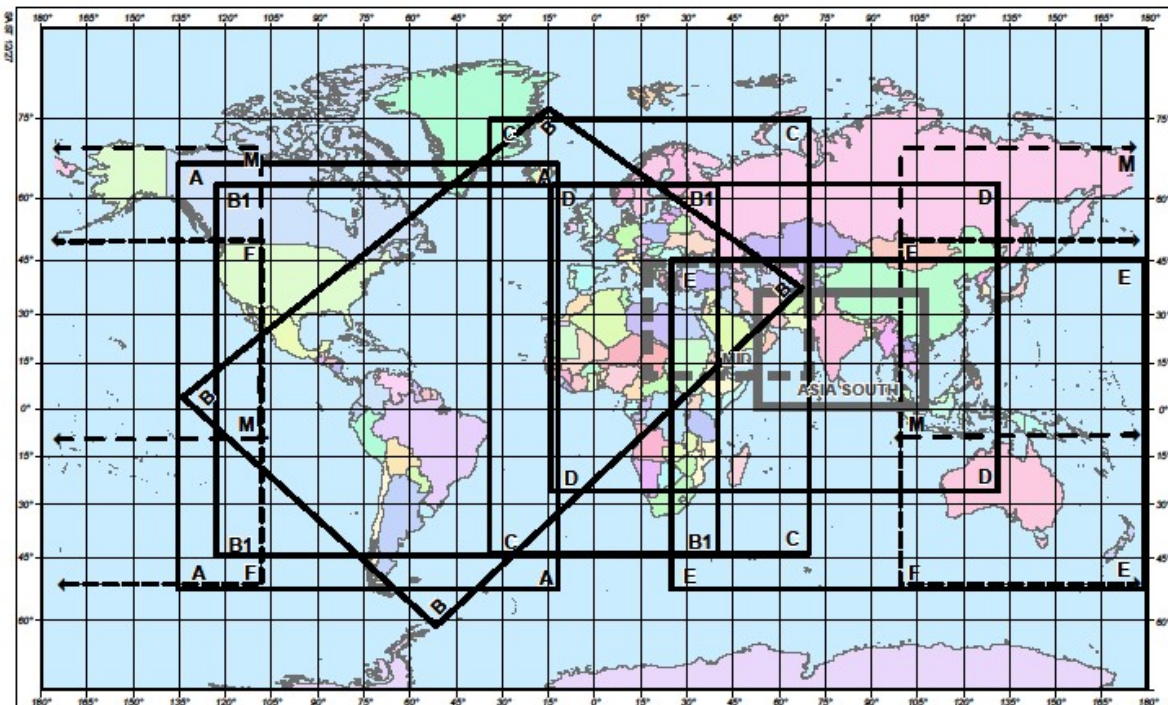


Figure A8-1. Fixed areas of coverage of WAFS forecasts in chart form — Mercator projection

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CHART	LATITUDE	LONGITUDE		CHART	LATITUDE	LONGITUDE
A	N6700	W13724		D	N6300	W01500
A	N6700	W01236		D	N6300	E13200
A	S5400	W01236		D	S2700	E13200
A	S5400	W13724		D	S2700	W01500
ASIA	N3600	E05300		E	N4455	E02446
ASIA	N3600	E10800		E	N4455	E18000
ASIA	0000	E10800		E	S5355	E18000
ASIA	0000	E05300		E	S5355	E02446
B	N0304	W13557		F	N5000	E10000
B	N7644	W01545		F	N5000	W11000
B	N3707	E06732		F	S5242	W11000
B	S6217	W05240		F	S5242	E10000
B1	N6242	W12500		M	N7000	E10000
B1	N6242	E04000		M	N7000	W11000
B1	S4530	E04000		M	S1000	W11000
B1	S4530	W12500		M	S1000	E10000
C	N7500	W03500		MID	N4400	E01700
C	N7500	E07000		MID	N4400	E07000
C	S4500	E07000		MID	N1000	E07000
C	S4500	W03500		MID	N1000	E01700

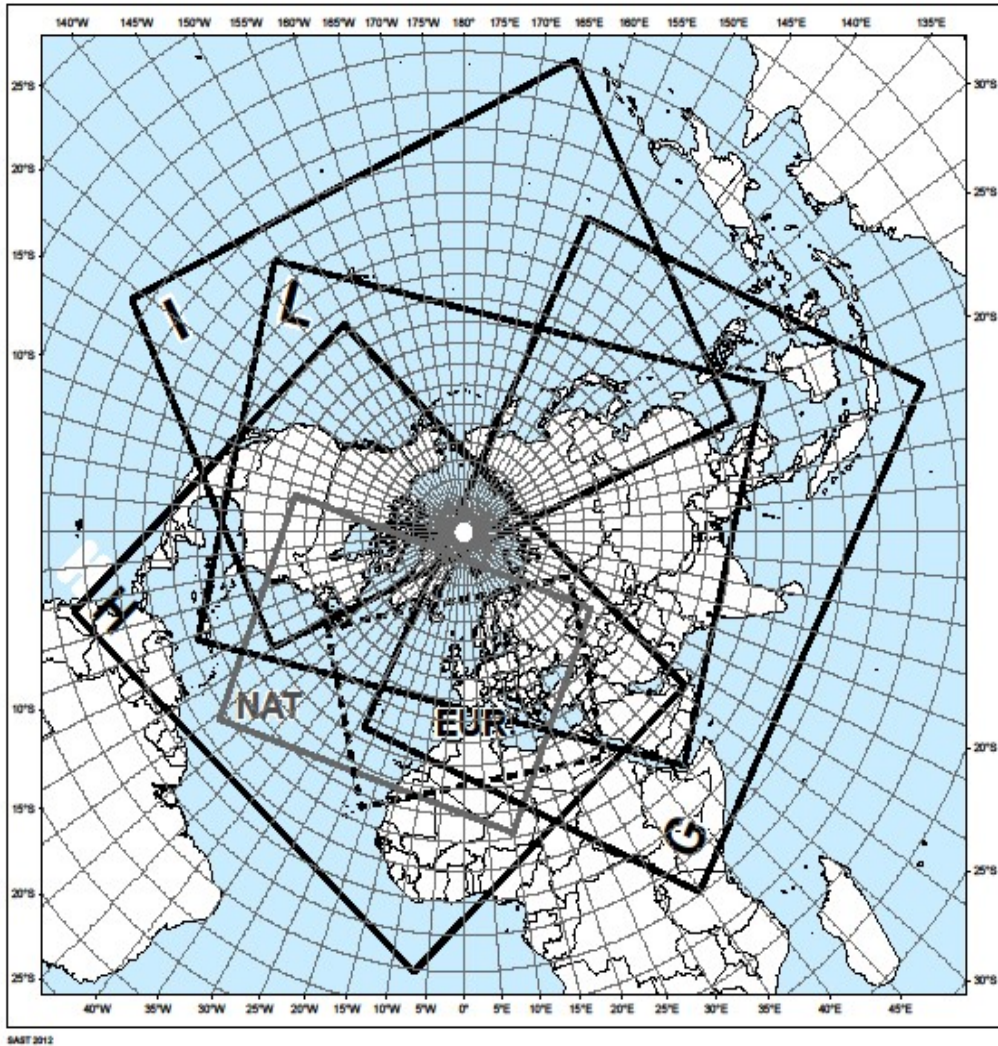


Figure A8-2. Fixed areas of coverage of WAFS forecasts in chart form — Polar stereographic projection (northern hemisphere)

CHART	LATITUDE	LONGITUDE	CHART	LATITUDE	LONGITUDE
EUR	N4633	W05634	I	N1912	E11130
EUR	N5842	E06824	I	N3330	W06012
EUR	N2621	E03325	I	N0126	W12327
EUR	N2123	W02136	I	S0647	E16601
G	N3552	W02822	L	N1205	E11449
G	N1341	E15711	L	N1518	E04500
G	S0916	E10651	L	N2020	W06900
G	S0048	E03447	L	N1413	W14338
H	N3127	W14836	NAT	N4439	W10143
H	N2411	E05645	NAT	N5042	E06017
H	S0127	W00651	NAT	N1938	E00957
H	N0133	W07902	NAT	N1711	W05406

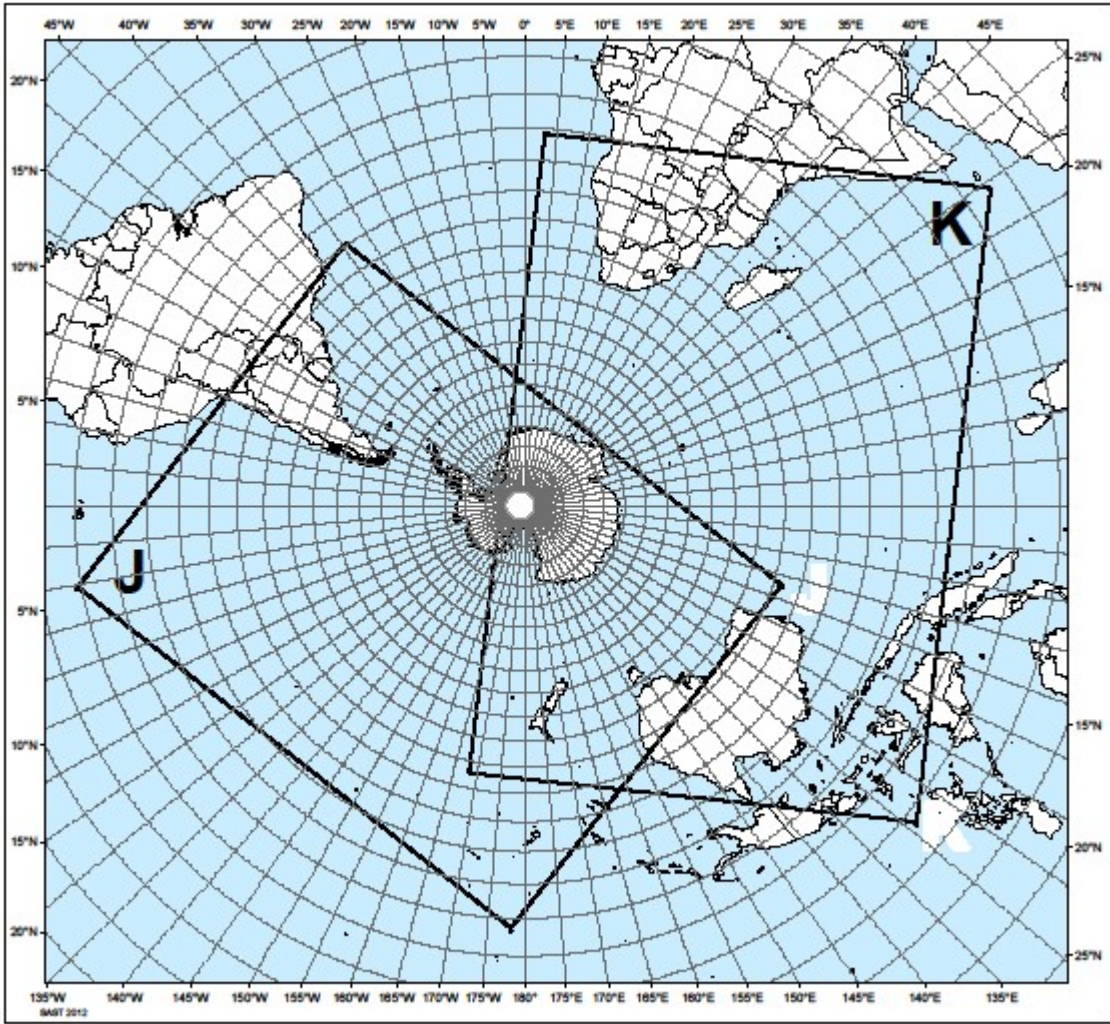


Figure A8-3. Fixed areas of coverage of WAFS forecasts in chart form — Polar stereographic projection (southern hemisphere)

CHART	LATITUDE	LONGITUDE
J	S0318	W17812
J	N0037	W10032
J	S2000	W03400
J	S2806	E10717
K	N1255	E05549
K	N0642	E12905
K	S2744	W16841
K	S1105	E00317