Republic of the Philippines
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES

MEMORANDUM CIRCULAR NO.: 02-2021

TO : ALL CONCERNED

FROM : DIRECTOR GENERAL

SUBJECT : AMENDMENT TO PHILIPPINE CIVIL AVIATION REGULATIONS - AIR NAVIGATION SERVICES (CAR-ANS) PART 3 INCORPORATING AMENDMENT 79 TO ICAO ANNEX 3 AND OTHER SUPPLEMENTARY AMENDMENTS

REFERENCE:

1. Philippine Civil Aviation Regulations- Air Navigation Services Part 3, Issue 4 Amendment No. 5
2. ICAO Annex 3; Amendment 79
3. CAAP Regulations Amendment Procedures
4. Board Resolution No. 2012-054 dated 28 September 2012

Pursuant to the powers vested in me under the Republic Act 9497, otherwise known as the Civil Aviation Authority Act of 2008 and in accordance with the Board Resolution No.: 2012-054 dated 28 September 2012, I hereby approve the incorporation of ICAO Annex 3 Amendment No. 79 and other supplementary amendments to the Philippine Civil Aviation Regulations – Air Navigation Services (CAR-ANS) Part 3.

ORIGINAL REGULATION SUBJECT FOR REVIEW AND REVISION:

CAR-ANS Part 3 Governing Aeronautical Meteorological Service

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3.1 Definitions

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

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

…

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

…

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

…

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

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

…

Space weather ~~centre~~ center (SWXC). A ~~centre~~ center designated to monitor and provide advisory information on space weather phenomena expected to affect high-frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems and/or pose a radiation risk to aircraft occupants.

Note.— A space weather ~~centre~~ center is designated as global and/or regional.

…

State volcano observatory. A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control ~~centre~~ center/flight information ~~centre~~,center meteorological watch office and volcanic ash advisory ~~centre~~ center.

…

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

…

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

…

World area forecast ~~centre~~ center (WAFC). A meteorological ~~centre~~ center designated to prepare and issue significant weather forecasts and upper-air forecasts in digital form on a global basis direct to States using the aeronautical fixed service Internet-based services.

…

3.2 GENERAL PROVISIONS

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3.2.1 Objective, determination and provision of meteorological service

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3.2.1.4 The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) as the country's designated Meteorological Authority, in coordination with the Civil Aviation Authority of the Philippines (CAAP), hereby assumed the mandate to provide or to arrange for the provision of meteorological service for air navigation on its behalf. Details of the meteorological authority so designated shall be included in the aeronautical information publication (AIP).

Note.— Detailed specifications concerning presentation and contents of the aeronautical information publication is provided in the ~~Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066),~~ Manual of Standards for Aeronautical Information Services (MOS-AIS), Appendix 2.

…

3.2.2 Supply, quality assurance and use of meteorological information

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3.2.2.3 The quality system established in accordance with 3.2.2.2 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 ~~International Organization for Standardization~~ (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance ~~programme~~. program The details of a successful ~~programme~~ program are to be formulated by each State and in most cases are unique to the State organization. Guidance on the establishment and implementation of ~~a~~ quality management system is given in the ~~Manual on the Quality Management System for the Provision of Meteorological Service to International Air Navigation (Doc 9873)~~. Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers *(WMO-No. 1100).*

…

CHAPTER 3.3. GLOBAL SYSTEMS, SUPPORTING ~~CENTRES~~ CENTERS AND METEOROLOGICAL OFFICES

~~3.3.1 Objective of the world area forecast system~~

~~The objective of the world area forecast system shall be to supply meteorological authorities and other users with forecasts of global upper wind, upper-air temperature and humidity, direction, speed and height of maximum wind, tropopause height and temperature and forecasts of significant weather phenomena 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 advantages of evolving technologies.~~

~~3.3.2 World area forecast system~~

~~3.3.2.1 The meteorological authority shall be responsible for the provision of aeronautical meteorological information provided by the world area forecast centres. The meteorological information shall include:~~

~~a) Global forecasts for grid points in digital form for all required levels and in a standard format; the forecasts shall comprise upper winds, upper-air temperatures and humidity, tropopause heights and temperatures, maximum wind speed, direction and height cumulonimbus clouds, icing and turbulence;~~

~~b) Global forecasts of significant weather phenomena in digital form;~~

~~c) Amendments to the forecasts;~~

~~d) Information concerning the release of radioactive materials into the atmosphere from its associated WMO regional specialized meteorological centre for the provision of transport model products for radiological environmental emergency response, in order to include the information in significant weather forecasts; and~~

~~e) Information on volcanic activity/eruptions and significant weather forecasts from associated VAACs.~~

~~3.3.2.2 In case of interruption of the operation of a WAFC, its function shall be carried out by the other WAFC.~~

~~*Note.- Back-up procedures to be used in case of interruption of the operation of a WAFC are updated by the World Area Forecast System Operations Group (WAFSOPSG) as necessary; the latest revision can be found on the ICAO WAFSOPSG website.*~~

…

3.3.~~3~~1 Aerodrome meteorological offices

3.3.~~3~~1.1 The designated Meteorological Authority 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.

3.3.~~3~~1.2 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:

…

3.3.~~3~~1.3 The aerodromes for which landing forecasts are required shall be determined by designated meteorological authority.

3.3.~~3~~1.4 For an aerodrome without an aerodrome meteorological office located at the aerodrome:

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3.3.~~4~~2 Meteorological watch offices

3.3.~~4~~2.1 The CAAP, having accepted the responsibility for providing air traffic services within a flight information region or a control area, shall arrange with PAGASA for the establishment and/or operation of one or more meteorological watch offices.

…

3.3.~~4~~2.2 A meteorological watch office shall:

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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 WMO regional specialized meteorological ~~centres~~ centers (RSMC) for the provision of transport model products for radiological environmental emergency response, at the request of PAG-ASA 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.

3.3.~~4~~2.3 The boundaries of the area over which meteorological watch is to be maintained by a meteorological watch office shall be coincident with the boundaries of a flight information region or a control area or a combination of flight information regions and/or control areas.

3.3.2.4 An MWO shall coordinate SIGMET with neighboring MWO(s), especially when the en-route 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 (ICAO Doc 8896).

~~**3.3.5 Volcanic ash advisory centers**~~

~~3.3.5.1 The Philippines, having accepted, by regional air navigation agreement, the responsibility for providing volcanic ash advisory from associated VAAC within the framework of the international airways volcano watch.~~

~~The Philippines shall respond to a notification that a volcano has erupted, or its expected to erupt or volcanic ash is reported in its area of responsibility, and shall:~~

~~a) monitor 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 includes data derived from Doppler weather radar, ceilometers, lidar and passive infrared sensors.*~~

~~b) issue advisory information regarding the extent and forecast movement of the volcanic ash "cloud" to:~~

~~*Note.- The AFTN address to be used by the VAACs is given in the Handbook on the International Airways Volcano Watch (IAVW) (Doc 9766) which is available on the ICAO IAVWOPSG website.*~~

~~c) world area forecast centres, international OPMET databanks, international NOTAM offices, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services; and~~

~~d) issue updated advisory information to the meteorological watch offices, area control centers, flight information centers and VAACs referred to in c), as necessary, but at least every six hours until such time as:~~

~~1) volcanic ash "cloud" is no longer identifiable from satellite data and, where available, ground -based and airborne date;~~

~~2) no further reports of volcanic ash are received from the area; and~~

~~3) no further eruptions of the volcano are reported.~~

~~3.3.5.2 VAACs shall maintain a 24-hour watch.~~

~~3.3.5.3 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.*~~

3.3.~~6~~3 Philippine volcano observatories

The Philippines with active or potentially active volcanoes shall maintain volcano observatories through PHIVOLCS to monitor active or potentially active volcanoes and shall arrange that selected PHIVOLCS volcano observatories, as designated by regional air navigation agreement, observe significant pre-eruption volcanic activity, volcanic eruption and/or volcanic ash in the atmosphere and shall send this information as quickly as practicable to its associated ACC/FIC, MWO and VAAC.

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~~**3.3.7 Tropical cyclone advisory**~~

~~3.3.7.1 The Philippines through PAGASA shall disseminate tropical cyclone advisory from associated TCAC.~~

~~3.3.7.2 PAGASA shall ensure continuous linkage with associated TCAC to further monitor the development of tropical cyclones in the Philippines area of responsibility, utilizing geostationary and polar-orbiting satellite data, radar data and other meteorological information.~~

~~3.3.7.3 PAGASA shall issue advisory information concerning the position of the cyclone centre, its direction and speed of movement, central pressure and maximum surface wind near the centre in abbreviated plain language to:~~

~~1) meteorological watch offices in its area of responsibility;~~

~~2) other TCACs whose areas of responsibility may be affected; and~~

~~3) world area forecast centres, international OPMET databanks, and centres designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.~~

~~3.3.7.4 PAGASA shall issue updated advisory information to meteorological watch offices for each tropical cyclone, as necessary, but at least every six hours.~~

…

3.3.~~8~~4 Space weather ~~centres~~ centers

(RESERVED)

~~3.3.8.1 PAGASA, 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.~~

~~3.3.8.2 SWXC shall maintain a 24-hour watch.~~

~~3.3.8.3 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).*~~

…

3.5 AIRCRAFT OBSERVATIONS AND REPORTS

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3.5.8 Relay of air-reports by ATS units

The meteorological authority concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of:

…

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

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3.7 SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS

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3.7.1 SIGMET Information

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

…

3.9 SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

3.9.1 General provisions

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3.9.1.3 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:

…

i) meteorological satellite images; and

j) ground-based weather radar information~~;~~.

~~k) space weather advisory information relevant to the whole route.~~

…

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

…

3.9.4.2 Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services by operators, flight crew members and other aeronautical personnel concerned shall be as agreed between the meteorological authority and the relevant civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with CAR-ANS Part 15, 15.2.1.1 c).

Note.— The meteorological and aeronautical information services information concerned is specified in 3.9.1 to 3.9.3 and Appendix 3.8 and in the ~~Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066),~~ Manual of Standards for Aeronautical Information Services (MOS-AIS), 5.5, respectively.

…

3.10 INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

…

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

…

3.11 REQUIREMENTS FOR AND USE OF COMMUNICATIONS

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3.11.1 Requirements for communications

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

…

3.11.1.9 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~~ Centers, providing for global coverage are used to support the global exchanges of operational meteorological information.

…

APPENDIX 3.1 FLIGHT DOCUMENTATION — MODEL CHARTS AND FORMS

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MODEL TCG Tropical cyclone advisory information in graphical format

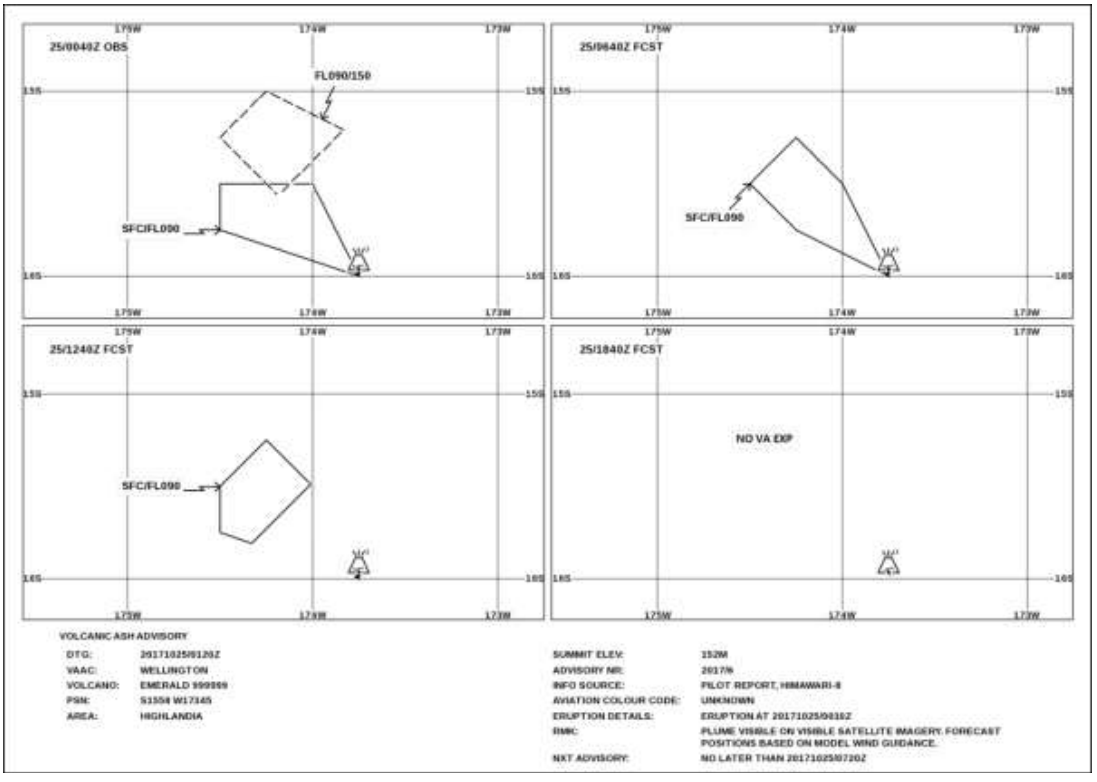
MODEL VAG Volcanic ash advisory information in graphical format
Example 1. Mercator projection
Example 2. Polar stereographic projection

MODEL STC SIGMET for tropical cyclone in graphical format

MODEL SVA SIGMET for volcanic ash in graphical format
Example 1. Mercator projection
Example 2. Polar stereographic projection

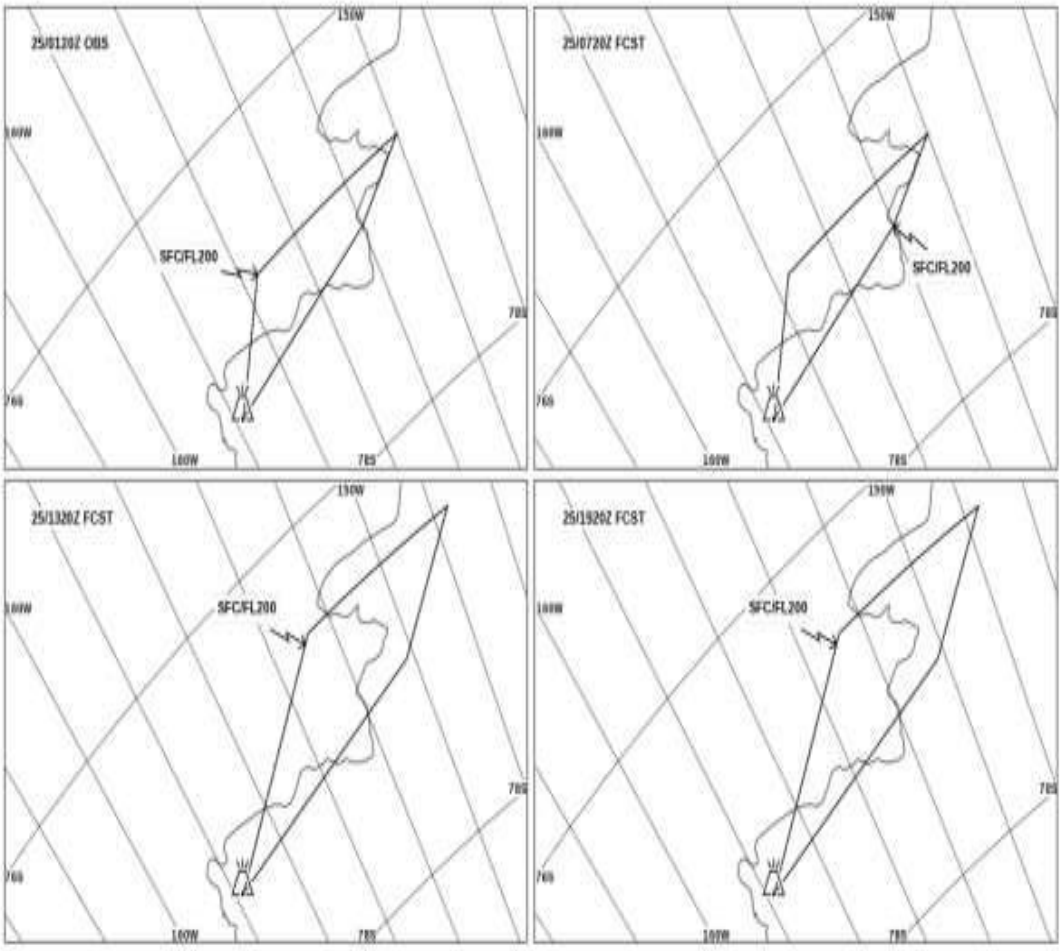
…

VOLCANIC ASH ADVISORY INFORMATION
IN GRAPHICAL FORMAT MODEL VAG
Example 1. Mercator projection



VOLCANIC ASH ADVISORY INFORMATION
IN GRAPHICAL FORMAT **MODEL VAG**

Example 2. Polar stereographic projection



VOLCANIC ASH ADVISORY

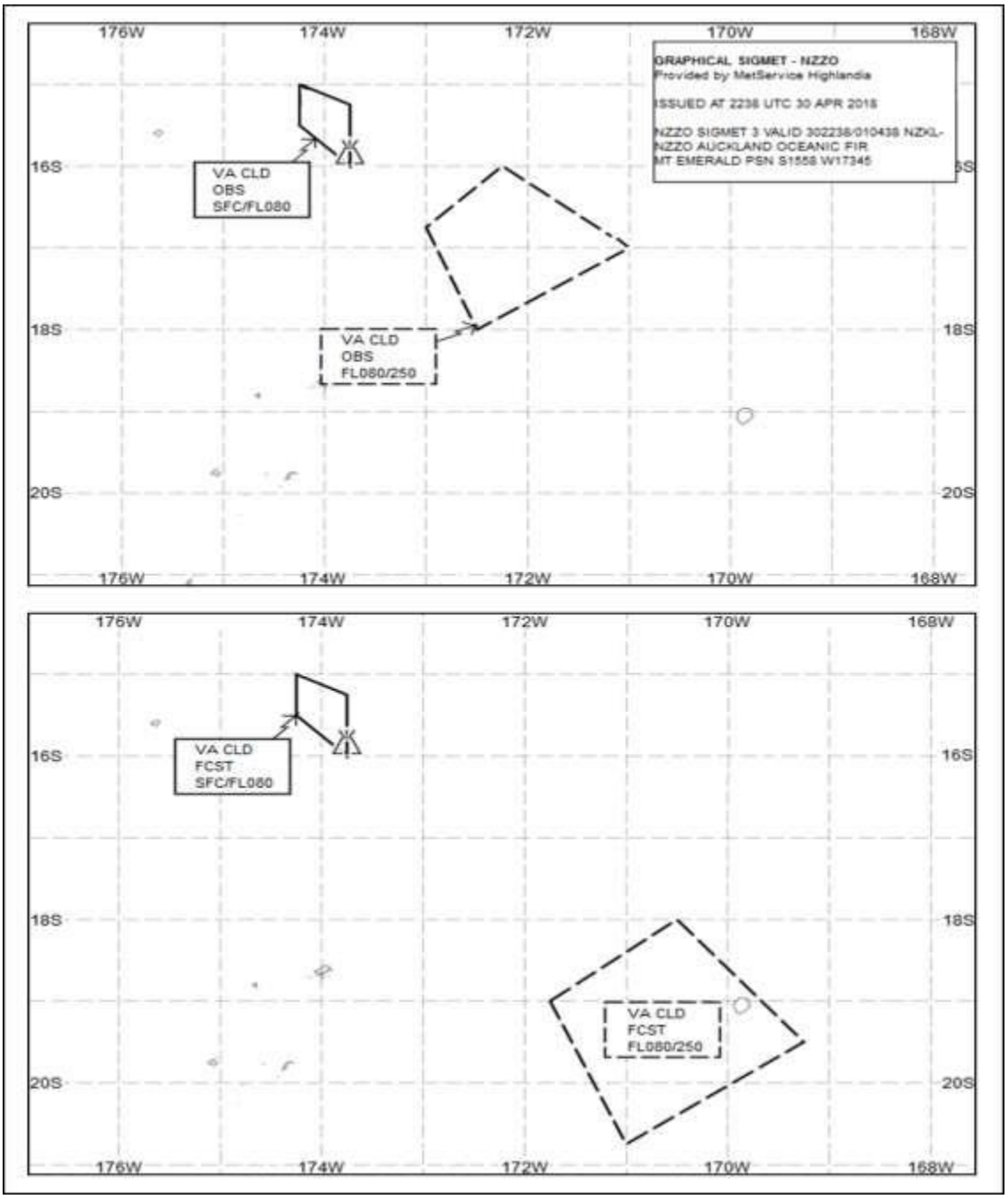
DTG:	20171025/0131Z
VAAC:	WELLINGTON
VOLCANO:	SAPPHIRE 999999
PSN:	S7715 W15747
AREA:	LOWLANDIA

SUMMIT ELEV:	321M
ADVISORY NR:	2017/7
INFO SOURCE:	SATELLITE IMAGERY
AVIATION COLOUR CODE:	UNKNOWN
ERUPTION DETAILS:	CONTINUOUS EMISSIONS TO FL200
RMK:	VA PARTIALLY OBSCURED BY MET CLOUD ALONG SOUTHERN BOUNDARY.
NXT ADVISORY:	NO LATER THAN 20171025/0735Z

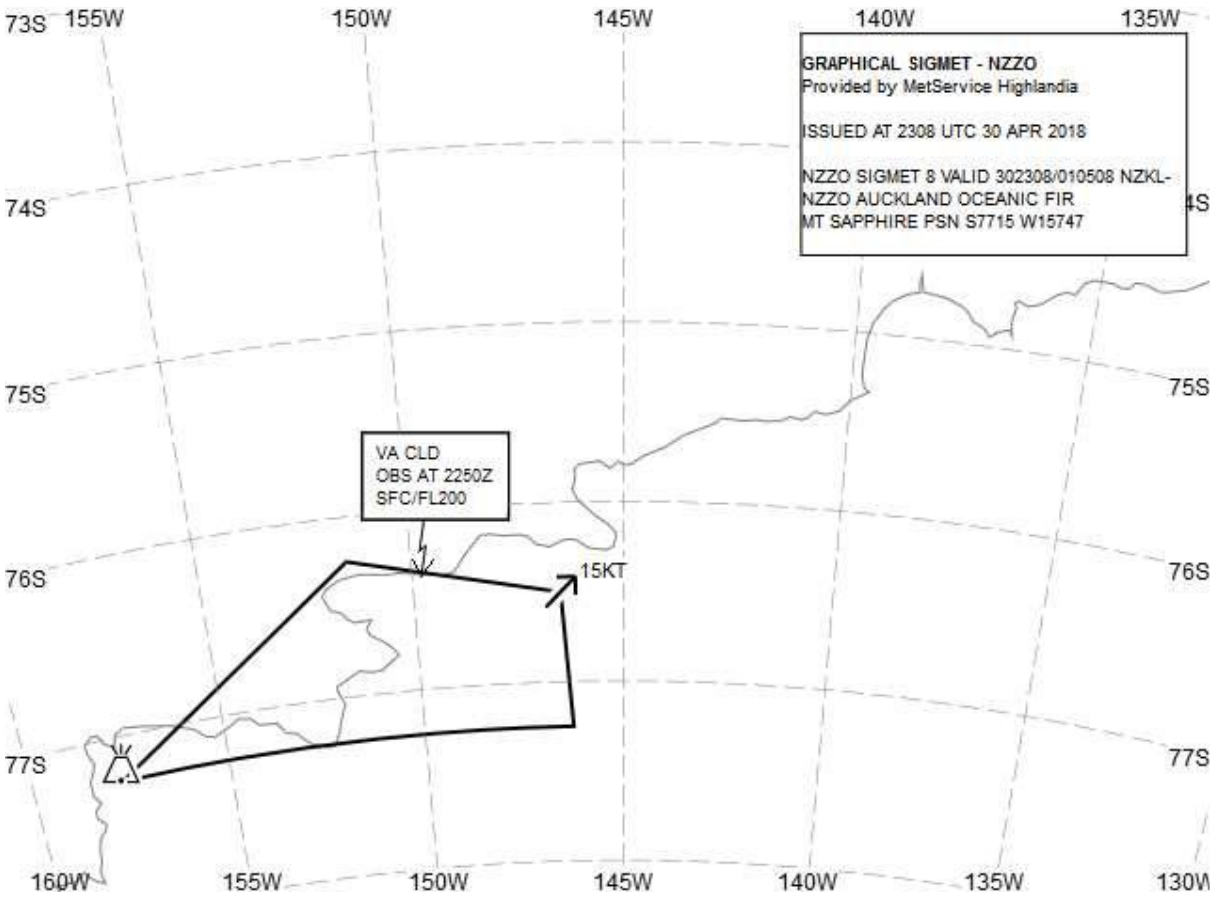
…

SIGMET FOR VOLCANIC ASH IN GRAPHICAL FORMAT MODEL SVA

Example 1. Mercator projection



SIGMET FOR VOLCANIC ASH
IN GRAPHICAL FORMAT **MODEL SVA**
Example2. Polar stereographic projection



…

APPENDIX 3.2 TECHNICAL SPECIFICATIONS RELATED TO GLOBAL SYSTEMS, SUPPORTING ~~CENTRES~~ CENTERS AND METEOROLOGICAL OFFICES

~~1. WORLD AREA FORECAST SYSTEM~~

~~1.1 Formats and codes~~

~~WAFCs shall adopt uniform formats and codes for the supply of forecasts.~~

~~1.2 Upper-air gridded forecasts~~

~~1.2.1 The forecasts of upper wind; upper-air temperature; and humidity; direction, speed and flight level of maximum wind; flight level and temperature of tropopause, areas of cumulonimbus clouds, icing, clear-air and in-cloud turbulence, and geopotential altitude of flight levels shall be prepared four times a day by a WAFC and shall be valid for fixed valid times at 6, 9, 12, 15, 18, 21, 24, 27, 30, 33 and 36 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based. The dissemination of each~~

~~forecast shall be in the above order and shall be completed as soon as technically feasible but not later than 6 hours after standard time of observation.~~

~~1.2.2 The grid point forecasts prepared by a WAFC shall comprise:~~

~~a) wind and temperature data for flight levels 50 (850 hPa), 80 (750 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 210 (450 hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 320 (275 hPa), 340 (250 hPa), 360 (225 hPa), 390 (200 hPa), 410 (175 hPa), 450 (150 hPa) 480 (125 hPa) and 530 (100 hPa);~~

~~b) flight level and temperature of tropopause;~~

~~c) direction, speed and flight level of maximum wind;~~

~~d) humidity data for flight levels 50 (850 hPa), 80 750 hPa), 100 (700 hPa), 140 (600 hPa) and 180 (500 hPa);~~

~~e) horizontal extent and flight levels of base and top of cumulonimbus clouds;~~

~~f) icing for layers centred at flight levels 60 (800 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300 hPa);~~

~~g) clear-air turbulence for layers centred at flight levels 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa);~~

~~h) in-cloud turbulence for layers centred at flight levels 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 240 (400 hPa) and 300 (300 hPa); and~~

~~*Note 1.— Layers centred at a flight level referred to in f) and h) have a depth of 100 hPa.*~~

~~*Note 2.— Layers centred at a flight level referred to in g) have a depth of 50 hPa.*~~

~~i) geopotential altitude data for flight levels 50 (850 hPa), 80 (750 hPa), 100 (700 hPa), 140 (600 hPa), 180 (500 hPa), 210 (450 hPa), 240 (400 hPa), 270 (350 hPa), 300 (300 hPa), 320 (275 hPa), 340 (250 hPa), 360 (225 hPa), 390 (200 hPa), 410 (175 hPa), 450 (150 hPa), 480 (125 hPa) and 530 (100 hPa).~~

~~1.2.3 The foregoing grid point forecasts shall be issued by a WAFC in binary code form using the GRIB code form prescribed by WMO.~~

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

~~1.2.4 The foregoing grid point forecasts shall be prepared by a WAFC in a regular grid with a horizontal resolution of 1.25° of latitude and longitude.~~

1.~~3~~ Significant weather (SIGWX) forecasts

~~1.3.1~~ 1.2 General provisions

~~1.3.1.1~~ 1.2.1 Forecasts of significant en-route weather phenomena shall be prepared as SIGWX forecasts four times a day by a WAFC and shall be valid for fixed valid times at 24 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based. ~~The dissemination of~~ ~~e~~Each forecast shall be ~~completed~~ disseminated as soon as technically feasible but not later than ~~9~~ 7 hours after standard time of observation under normal operations and not later than 9 hours after standard time of observation during backup operations.

~~1.3.1.2~~ 1.2.2 SIGWX forecasts shall be issued in binary code form using the BUFR code form prescribed by WMO.

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

1.2.3 As of 4 November 2021, in addition to 1.2.2 SIGWX forecasts should be disseminated in IWXXM GML form.

Note 1.— Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

1.3.~~2~~ Types of SIGWX forecasts

SIGWX forecasts shall be issued as high-level SIGWX forecasts for flight levels between 250 and 630.

Note.— Medium-level SIGWX forecasts for flight levels between 100 and 250 for limited geographical areas will continue to be issued until such time that flight documentation to be generated from the gridded forecasts of cumulonimbus clouds, icing and turbulence fully meets user requirements.

~~1.3.3~~ 1.4 Items included in SIGWX forecasts

SIGWX forecasts shall include the following items:

…

~~1.3.4~~ 1.5 Criteria for including items in SIGWX forecasts

The following criteria shall be applied for SIGWX forecasts:

…

2. AERODROME METEOROLOGICAL OFFICES

2.1 Use of WAFS products

…

2.1.2 In order to ensure uniformity and standardization of flight documentation, the WAFS GRIB and BUFR data received and, as of 4 November 2021, IWXXM data received, shall be decoded into standard WAFS charts in accordance with relevant provisions in this CAR-ANS, and the meteorological content and identification of the originator of the WAFS forecasts shall not be amended.

2.2 Notification of WAFC concerning significant discrepancies

Aerodrome meteorological offices using WAFS BUFR or, as of 4 November 2021, IWXXM data shall notify the WAFC concerned immediately if significant discrepancies are detected or reported in respect of WAFS SIGWX forecasts concerning:

…

~~**3. VOLCANIC ASH ADVISORY CENTRES (VAAC)**~~

~~**3.1 Volcanic ash advisory information**~~

~~3.1.1 The advisory information on volcanic ash issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, shall be in accordance with the template shown in Table A3.2-1. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used.~~

~~3.1.2 Until 4 November 2020, volcanic ash advisory information shall be disseminated in IWXXM GML form in addition to the dissemination of this advisory information in accordance with 3.1.1.~~

~~3.1.3 As of 5 November 2020, volcanic ash advisory information shall be disseminated in IWXXM GML form in addition to the dissemination of this advisory information in accordance with 3.1.1.~~

~~*Note. — The technical specifications for IWXXM are contained in the* Manual on Codes *(WMO-No. 306), Volume I.3, Part D* — Representation Derived from Data Models*. Guidance on the implementation of IWXXM is provided in the* Manual on the Digital Exchange of Aeronautical Meteorological Information *(Doc 10003).*~~

~~3.1.4 The volcanic ash advisory information listed in Table A3.2-1, when prepared in graphical format, shall be as specified in Appendix 3.1 and issued using the portable network graphics (PNG) format.~~

~~4.~~ 3. STATE VOLCANO OBSERVATORIES

~~4.1~~ 3.1 Information from State volcano observatories

The information required to be sent by State volcano observatories to their associated ACCs/FICs, MWO and VAAC shall comprise:

…

~~**5. TROPICAL CYCLONE ADVISORY CENTRES**~~

~~**5.1 Tropical cyclone advisory information**~~

~~5.1.1 The advisory information on tropical cyclones shall be issued for tropical cyclones when the maximum of the 10-minute mean surface wind speed is expected to reach or exceed 17 m/s (34 kt) during the period covered by the advisory.~~

~~5.1.2 The advisory information on tropical cyclones disseminated in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, shall be in accordance with the template shown in Table A3.2-2.~~

~~5.1.3 Until 4 November 2020, tropical cyclone advisory information shall be disseminated in IWXXM GML form in addition to the dissemination of this advisory information in accordance with 5.1.2.~~

~~5.1.4 As of 5 November 2020, tropical cyclone advisory centres shall disseminate tropical cyclone advisory information in IWXXM GML form in addition to the dissemination of this advisory information in abbreviated plain language in accordance with 5.1.2.~~

~~*Note.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).*~~

~~5.1.5 The tropical cyclone advisory information listed in Table A3.2-2, when prepared in graphical format, shall be as specified in Appendix 3.1 and issued using the PNG format.~~

~~6.~~ 4. SPACE WEATHER ~~CENTRES~~ CENTERS

(RESERVED)

~~6.1 Space weather advisory information~~

…

~~6.1.1 Advisory information on space weather shall be issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self explanatory nature, and shall be in accordance with the template shown in Table A3.2-3. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used.~~

~~6.1.2 As of 7 November 2019 and until 4 November 2020, space weather advisory information shall be disseminated in IWXXM GML for, in addition to the dissemination of space weather advisory information in abbreviated plain language in accordance with 6.1.1.~~

~~6.1.3 As of 5 November 2020, space weather advisory information shall be disseminated in IWXXM GML form, in addition to the dissemination of this advisory information in abbreviated plain language in accordance with 6.1.1.~~

~~*Note.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO No. 306), Volume I.3, Part D — Representations Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).*~~

~~6.1.4 One or more of the following space weather effects shall be included in the space weather advisory information, using their respective abbreviations as indicated below:~~

~~*- HF communications (propagation, absorption) HF COM*~~

~~*- communications via satellite (propagation, absorption) SATCOM*~~

- *GNSS-based navigation and surveillance (degradation) GNSS*

- *radiation at flight levels (increased exposure) RADIATION*

6.1.5 The following intensities shall be included in space weather advisory information, using their respective abbreviations as indicated below*:*

moderate MOD
severe SEV

Note. Guidance on the use of these intensities is provided in the Manual on Space Weather Information in Support of International Air Navigation *(Doc 10100).*

6.1.6 Updated advisory information on space weather phenomena shall be issued as necessary but at least every six hours until such time as the space weather phenomena are no longer detected and/or are no longer expected to have an impact.

Table A3.2-1. Template for advisory message for volcanic ash

Key: M = inclusion mandatory, part of every message;
O = inclusion optional;
C = inclusion conditional, included whenever applicable;
= = a double line indicates that the text following it shall be placed on the subsequent line.

Note 1. The ranges and resolutions for the numerical elements included in advisory messages for volcanic ash are shown in Appendix 3.6, Table A3.6-4.

Note 2. The explanations for the abbreviations can be found in the Procedures for Air Navigation Services ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 3. Inclusion of a "colon" after each element heading is mandatory.

Note 4. The numbers 1 to 18 are included only for clarity and they are not part of the advisory message, as shown in the example.

Element		*Detailed content*	*Template(s)*	*Examples*
1	Identification of the type of message (M)	Type of message	VA ADVISORY	VA ADVISORY
2	Status indicator (C)[1]	Indicator of test or exercise	STATUS: TEST or EXER	STATUS: TEST STATUS: EXER
3	Time of origin (M)	Year, month, day and time in UTC of issue	DTG: nnnnnnnn/nnnnZ	DTG: 20080923/0130Z
…	…	…	… …	… …

18	Remarks (M)	Remarks, as necessary	RMK:	*Free text up to 256 characters* *or* NIL	RMK:	LATEST REP FM KVERT (0120Z) INDICATES ERUPTION HAS CEASED. TWO DISPERSING VA CLD ARE EVIDENT ON SATELLITE IMAGERY NIL
19	Next advisory (M)	Year, month, day and time in UTC	NXT ADVISORY:	nnnnnnnn/nnnnZ *or* NO LATER THAN nnnnnnnn/nnnnZ *or* NO FURTHER ADVISORIES *or* WILL BE ISSUED BY nnnnnnnn/nnnnZ	NXT ADVISORY:	20080923/0730Z NO LATER THAN nnnnnnnn/nnnnZ NO FURTHER ADVISORIES WILL BE ISSUED BY nnnnnnnn/nnnnZ

Notes.—

1. Used only when the message issued to indicate that a test or an exercise is taking place. When the word "TEST" or the abbreviation "EXER" is included, the message should contain information that should not be used operationally or will otherwise end immediately after the word "TEST". [Applicable 7 November 2019]

2. International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).

3. A straight line between two points drawn on a map in the Mercator projection or a straight line between two points which crosses lines of longitude at a constant angle.

4. Up to 4 selected layers.

5. If ash reported (e.g. AIREP) but not identifiable from satellite data

Example A3.2-1. Advisory message for volcanic ash

VA ADVISORY DTG: 20080923/0130Z

VAAC:	TOKYO
VOLCANO:	KARYMSKY 1000-13
PSN:	N5403 E15927
AREA:	RUSSIA
SUMMIT ELEV:	1536M
ADVISORY NR:	2008/4
INFO SOURCE:	MTSAT-1R KVERT KEMSD
…	…

Table A3.2-2. Template for advisory message for tropical cyclones

Key: M = inclusion mandatory, part of every message;

C = inclusion conditional, included whenever applicable;

= = a double line indicates that the text following it shall be placed on the subsequent line.

Note 1.— The ranges and resolutions for the numerical elements included in advisory messages for tropical cyclones are shown in Appendix 3.6, Table A3.6-4.

Note 2.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes *(PANS-ABC, Doc 8400).*

Note 3.— Inclusion of a "colon" after each element heading is mandatory.

Note 4.— The numbers 1 to 19 are included only for clarity and they are not part of the advisory message, as shown in the example.

Element		*Detailed content*	*Template(s)*	*Examples*
1	Identification of the type of message (M)	Type of message	TC ADVISORY	TC ADVISORY
2	Status indicator (C)[1]	Indicator of test or exercise	STATUS: TEST *or* EXER	STATUS: TEST EXER
…	…	…	…	…
20	Remarks (M)	Remarks, as necessary	RMK: Free text up to 256 characters or NIL	RMK: NIL
21	Expected time of issuance of next advisory (M)	Expected year, month, day and time (in UTC) of issuance of next advisory	NXT MSG: [BFR] nnnnnnnn/nnnnZ or NO MSG EXP	NXT MSG: 20040925/2000Z

Notes.—

1. Used only when the message issued to indicate that a test or an exercise is taking place. When the word "TEST" or the abbreviation "EXER" is included, the message may contain information that should not be used operationally or will otherwise end immediately after the word "TEST". [Applicable 7 November 2019]

2. Fictitious location.

3. In the case of CB clouds associated with a tropical cyclone covering more than one area within the area of responsibility, this element can be repeated, as necessary.

4. The number of coordinates should be kept to a minimum and should not normally exceed seven.

Example A3.2-2. Advisory message for tropical cyclones

TC ADVISORY	
DTG:	20040925/1900Z
TCAC:	YUFO
TC:	GLORIA
ADVISORY NR:	2004/13
OBS PSN:	25/1800Z N2706 W07306
CB:	WI 250NM OF TC CENTRE
MOV:	NW 20KMH
C:	965HPA
MAX WIND:	22MPS
FCST PSN +6 HR:	25/2200Z N2748 W07350
FCST MAX WIND +6 HR:	22MPS
FCST PSN +12 HR:	26/0400Z N2830 W07430
FCST MAX WIND +12 HR:	22MPS
FCST PSN +18 HR:	26/1000Z N2852 W07500
FCST MAX WIND +18 HR:	21MPS
FCST PSN +24 HR:	26/1600Z N2912 W07530
FCST MAX WIND +24 HR:	20MPS
RMK:	NIL
NXT MSG:	20040925/2000Z
*Ficticious location	

…

Table A3.2-3. Template for advisory message for space weather information

Key: M = inclusion mandatory, part of every message;

C = inclusion conditional, included whenever applicable;

= = a double line indicates that the text following it should be placed on the subsequent line.

Note 1. — The explanations for the abbreviations can be found in the PANS-ABC (Doc 8400).

Note 2. — The spatial resolutions are shown in Attachment E.

Note 3. — Inclusion of a colon after each element heading is mandatory.

Note 4. — The numbers 1 to 14 are included only for clarity and are not part of the advisory message, as shown in the examples.

Element		*Detailed content*	*Template(s)*	*Examples*
1	Identification of the type of message (M)	Type of message	SWX ADVISORY	SWX ADVISORY
2	Status indicator (C)[1]	Indicator of test or exercise	STATUS: TEST *or* EXER	STATUS: TEST EXER
3	Time of origin (M)	Year, month, day, time in UTC	DTG: nnnnnnnn/nnnnZ	DTG: 20161108/0100Z
4	Name of SWXC (M)	Name of SWXC	SWXC: Nnnnnnnnnnnn	SWXC: DONLON[2]
…	…	…	…	…
13	Remarks (M)	Remarks, as necessary	RMK: *Free text up to 256 characters* *or* NIL	RMK: SWX EVENT HAS CEASED WWW.SPACEWEATHERPROVIDER.COM NIL
14	Next advisory (M)	Year, month, day and time in UTC	NXT ADVISORY: nnnnnnnn/nnnnZ *or* NO FURTHER ADVISORIES *or* WILL BE ISSUED BY	NXT ADVISORY: 20161108/0700Z NO FURTHER ADVISORIES

Notes.—

1. Used only when the message issued to indicate that a test or an exercise is taking place. When the word "TEST" or the abbreviation "EXER" is included, the message must contain information that should not be used operationally or will otherwise end immediately after the word "TEST". [Applicable 7 November 2019]

2. Ficticious location.

3. One or more latitude ranges should be included in the space weather advisory information for "GNSS" and "RADIATION".

Example A3.2-3. Space weather advisory message (GNSS and HFCOM effects)

SWX ADVISORY	
DTG:	20161108/0100Z
SWXC:	DONLON*
ADVISORY NR:	2016/2
NR RPLC :	2016/1
SWX EFFECT:	HF COM MOD AND GNSS MOD
OBS SWX:	08/0100Z HNH HSH E18000 – W18000
FCST SWX +6 HR:	08/0700Z HNH HSH E18000 – W18000
FCST SWX +12 HR:	08/1300Z HNH HSH E18000 – W18000
FCST SWX +18 HR:	08/1900Z HNH HSH E18000 – W18000
FCST SWX +24 HR:	09/0100Z NO SWX EXP
RMK:	LOW LVL GEOMAGNETIC STORMING CAUSING INCREASED AURORAL ACT AND SUBSEQUENT MOD DEGRADATION OF GNSS AND HF COM AVBL IN THE AURORAL ZONE. THIS STORMING EXP TO SUBSIDE IN THE FCST PERIOD. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	NO FURTHER ADVISORIES
* Ficticious location	

Example A3.2-4. Space weather advisory message (RADIATION effects)

SWX ADVISORY	
DTG:	20161108/0100Z
SWXC:	DONLON*
ADVISORY NR:	2016/2
NR RPLC:	2016/1
SWX EFFECT:	RADIATION MOD
FCST SWX:	08/0100Z HNH HSH E18000 – W18000 ABV FL 350
FCST SWX +6 HR:	08/0700Z HNH HSH E18000 – W18000 ABV FL 350
FCST SWX +12 HR:	08/1300Z HNH HSH E18000 – W18000 ABV FL 350
FCST SWX +18 HR:	08/1900Z HNH HSH E18000 – W18000 ABV FL 350
FCST SWX +24 HR:	09/0100Z NO SWX EXP
RMK:	RADIATION LVL EXCEEDED 100 PCT OF BACKGROUND LVL AT FL350 AND ABV. THE CURRENT EVENT HAS PEAKED AND LVL SLW RTN TO

	BACKGROUND LVL. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	NO FURTHER ADVISORIES
* Ficticious location	

Example A3.2-5: Space weather advisory message (HF COM effects)

SWX ADVISORY	
DTG:	20161108/0100Z
SWXC:	DONLON*
ADVISORY NR:	2016/1
SWX EFFECT:	HF COM SEV
OBS SWX:	08/0100Z DAYLIGHT SIDE
FCST SWX +6 HR:	08/0700Z DAYLIGHT SIDE
FCST SWX +12 HR:	08/1300Z DAYLIGHT SIDE
FCST SWX +18 HR:	08/1900Z DAYLIGHT SIDE
FCST SWX +24 HR:	09/0100Z NO SWX EXP
RMK:	PERIODIC HF COM ABSORPTION AND LIKELY TO CONT IN THE NEAR TERM. CMPL AND PERIODIC LOSS OF HF ON THE SUNLIT SIDE OF THE EARTH EXP. CONT HF COM DEGRADATION LIKELY OVER THE NXT 7 DAYS. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	20161108/0700Z
* Ficticious location	

APPENDIX 3.3 TECHNICAL SPECIFICATIONS RELATED TO METEOROLOGICAL OBSERVATIONS AND REPORTS

(See CAR-ANS 3.4)

…

2. GENERAL CRITERIA RELATED TO METEOROLOGICAL REPORTS

2.1 Format of meteorological reports

…

2.1.3 2.1.3 Until 4 November 2020, METAR and SPECI shall be disseminated, in IWXXM GML form, in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.

2.1.4 2.1.3 As of 5 November 2020, METAR and SPECI shall be disseminated in IWXXM GML form in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes *(WMO-No. 306), Volume I.3, Part D —* Representation Derived from Data Models. *Guidance on the implementation of IWXXM is provided in the* ~~Manual on the Digital Exchange of Aeronautical Meteorological Information~~ Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

Note 2.— Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

…

3. DISSEMINATION OF METEOROLOGICAL REPORTS

3.1 METAR and SPECI

…

3.1.1 METAR and SPECI shall be disseminated to international OPMET databanks and the ~~centres~~ centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite, in accordance with regional air navigation agreement.

…

4.3 Runway visual range

…

4.3.1.2 Runway visual range shall be assessed at a lateral distance from the runway ~~centre~~ center line of not more than 120 m. The site for observations to be representative of the touchdown zone shall be located about 300 m along the runway from the threshold. The sites for observations to be representative of the mid-point and stop-end of the runway shall be located at a distance of 1 000 to 1 500 m along the runway from the threshold and at a distance of about 300 m from the other end of the runway. The exact position of these sites and, if necessary, additional sites shall be decided after considering aeronautical, meteorological and climatological factors such as long runways, swamps and other fog-prone areas.

…

Table A3.3-2. Template for METAR and SPECI
(As of 5 November 2020)

Element as specifi	*Detailed content*	*Template(s)*		*Examples*
…	…	…		…
END OF METAR IF THE REPORT IS MISSING.				
Surface wind (M)	Wind direction (M)	nn *or* ///[12]	VRB	24004MPS VRB01MPS ///10MPS (24008KT) (VRB02KT) 240//KT 19006MPS /////KT (19012KT) 00000MPS (00000KT) 140P49MPS (140P99KT)
	Wind speed (M)	[P]nn[*or* //[12]		
	Significant speed variations (C)[3]	G[P]nn[n]		
	Units of measurement (M)	MPS (*or* KT)		
	Significant directional	nnnVnnn	—	
Visibility (M)	Prevailing *or* minimum visibility (M)[5]	nnn *or* ////[12]	CAVOK	0350 //// CAVOK 7000

	Minimum visibility and direction of the minimum	nnnn[N] *or* nnnn[NE] *or* nnnn[E] *or* nnnn[SE] *or* nnnn[S] *or* nnnn[SW] *or*		9999 0800 2000 1200NW
Runway visual range (C)[7]	Name of the element	R		R32/04 00 R12R/1 700
	Runway (M)	nn[L]/*or* nn[C]/*or* nn[R]/		
	Runway visual range (M)	[P *or* M]nnnn *or* ////[12]		R16L/0650 R16C/0500 R16L///// R10///// R16R/0450
	Runway visual range past tendency (C)[8]	U, D *or* N		R12/1100U R26/0550N R20/0800D
•••	•••	•••	•••	•••

Element as specifie	*Detailed content*	*Template(s)*				*Examples*
Cloud (M)[14]	Cloud amount and height of cloud base *or* vertical visibility (M)	FEWnnn *or* SCTnnn *or* BKNnnn *or* OVCnnn *or* FEW///[12] *or*	VVnnn *or* VV///[12]	NSC *or* NCD[12]		FEW015 VV005 OVC030 VV/// NSC SCT010 OVC020 BKN/// ///015
	Cloud type (C)[2]	CB *or* TCU *or* ///[12]	—			BKN009TCU NCD SCT008 BKN025CB BKN025/// //////CB //////// BKN///TCU
Air and dew-point temperature (M)	Air and dew-point temperature (M)	[M]nn/[M]nn *or* ///[M]nn[12] *or* [M]nn///[12] *or* /////[12]				17/10 ///10 17/// ///// 02/M08
Pressure values (M)	Name of the element (M)	Q				Q0995 Q1009 Q1022 Q//// Q0987
	QNH (M)	~~N~~nnnn *or* ////[12]				
Supplementary information (C)	Recent weather (C)2· [9]	RERASN *or* REFZDZ *or* REFZRA *or* REDZ *or* RE[SH]RA *or* RE[SH]SN *or* RESG *or* RESHGR *or* RESHGS *or* REBLSN *or* RESS *or* REDS *or* RETSRA *or* RETSSN *or* RETSGR *or* RETSGS *or* RETS *or* REFC *or* REVA *or* REPL *or* REUP[12] *or* REFZUP12 *or* RETSUP12 *or* RESHUP[12] *or* RE//[12]				REFZRA RETSRA
	Wind shear (C)[2]	WS Rnn[L] *or* WS Rnn[C] *or* WS Rnn[R] *or* WS ALL RWY				WS R03 WS ALL RWY WS R18C

	Sea-surface temperature and state of the sea *or* significant wave height (C)[15]		~~W [M]nn/Sn *or* W[M]nn/Hn[n][n]~~ W[M]nn/Sn or W///Sn or W[M]nn/S/ or W[M]nn/Hn[n][n] or W///Hn[n][n] or W[M]nn/H///						W15/S2 W12/H75 W///S3 WM01/S/ W///H104 W17/H/// W///H/// W///S/
	~~State of the runway (C)16~~	~~Runway designator (M)~~	~~R nn[L]/ *or* Rnn[C]/ *or* Rnn[R]/~~			~~R/SNOCLO~~			~~R99/421594 R/SNOCLO R14L/CLRD//~~
		~~Runway deposits (M)~~	~~n *or* /~~	~~CLRD//~~					
		~~Extent of runway contamination (M)~~	~~n *or* /~~						
		~~Depth of deposit (M)~~	~~nn *or* //~~						
		~~Friction coefficient *or* braking~~	~~nn *or* //~~						
Trend forecast (O)[~~17~~16]	Change indicator (M)[~~18~~17]		NOSIG	BECMG *or* TEMPO					NOSIG BECMG FEW020 TEMPO 25018G25MPS (TEMPO 25036G50KT) BECMG FM1030 TL1130 CAVOK BECMG TL1700 0800 FG BECMG AT1800 9000 NSW BECMG FM1900 0500 +SNRA BECMG FM1100 SN TEMPO FM1130 BLSN TEMPO FM0330 TL0430 FZRA TEMPO TL1200 0600 BECMG AT1200 8000 NSW NSC BECMG AT1130 OVC010 TEMPO TL1530 +SHRA BKN012CB
	Period of change (C)[2]			FMnnnn *and/or* TLnnnn *or* ATnnnn					
	Wind (C)[2]			nnn[P]nn[n][G[P]nn[n]]MPS (*or* nnn[P]nn[G[P]nn]KT)					
	Prevailing visibility (C)[2]			nnnn				C A V O K	
	Weather phenomenon: intensity (C)[10]			– *or* +	—	N S W			
	Weather phenomenon: characteristics and type (C)[2, 9, 11]			DZ *or* RA *or* SN *or* SG *or* PL *or* DS *or* SS *or* FZDZ *or* FZRA *or* SHGR *or* SHGS *or* SHRA *or* SHSN *or* TSGR *or* TSGS *or* TSRA *or* TSSN	FG *or* BR *or* SA *or* DU *or* HZ *or* FU *or* VA *or* SQ *or* PO *or* FC *or* TS *or* BCFG *or* BLDU *or* BLSA *or* BLSN *or* DRDU *or* DRSA *or* DRSN *or* FZFG *or* MIFG *or*			
	Cloud amount and height of cloud base *or* vertical visibility (C)[2, 14]			FEWnnn *or* SCTnnn *or* BKNnnn *or* OVCnnn	VVnnn *or* VV///	N S C		
	Cloud type (C)[2,14]			CB *or* TCU	—			
…	…		…	…	…	…	…	…	…

Notes.—

…

12. ~~For automated reports only.~~ When a meteorological element is temporarily missing, or its value considered temporarily as incorrect, it is replaced by "/" for each digit of the abbreviation of the text message and indicated as missing for its IWXXM version.

…

~~16. To be included in accordance with 4.8.1.5 b) until 4 November 2020~~.

…

1~~7~~6. To be included in accordance with Chapter 6, 6.3.2.

1~~8~~7. Number of change indicators to be kept to a minimum in accordance with Appendix 5, 2.2.1, normally not exceeding three groups.

…

APPENDIX 3.4. TECHNICAL SPECIFICATIONS RELATED TO AIRCRAFT OBSERVATIONS AND REPORTS

…

2. CRITERIA FOR REPORTING

…

2.6 Turbulence

The turbulence shall be reported in terms ~~of the cube root~~ of the eddy dissipation rate (EDR).

Note.— The EDR is an aircraft-independent measure of turbulence. However, the relationship between the EDR value and the perception of turbulence is a function of aircraft type, and the mass, altitude, configuration and airspeed of the aircraft. The EDR values given below describe the severity levels for a medium-sized transport aircraft under typical en-route conditions (i.e. altitude, airspeed and weight).

2.6.1 Routine air-reports

The turbulence shall be reported during the en-route phase of the flight and shall refer to the 15-minute period immediately preceding the observation. Both the average and peak value of turbulence, together with the time of occurrence of the peak value to the nearest minute, shall be observed. The average and peak values shall be reported in terms ~~of the cube root~~ of EDR. The time of occurrence of the peak value shall be reported as indicated in Table A3.4-2. The turbulence shall be reported during the climb-out phase for the first 10 minutes of the flight and shall refer to the 30-second period immediately preceding the observation. The peak value of turbulence shall be observed.

2.6.2 Interpretation of the turbulence report

Turbulence shall be considered:

a) severe when the peak value ~~of the cube root~~ of EDR equals or exceeds ~~0.7~~0.45;

b) moderate when the peak value ~~of the cube root~~ of EDR is equal to or above ~~0.4~~0.20 and below ~~or equal to 0.7~~0.45;

c) light when the peak value ~~of the cube root~~ of EDR is above 0.10 and below ~~or equal to 0.4~~0.20; and

d) nil when the peak value o~~f the cube root~~ of EDR is below or equal to 0.10.

~~*Note. The EDR is an aircraft-independent measure of turbulence. However, the relationship between the EDR value and the perception of turbulence is a function of aircraft type, and the mass, altitude, configuration and airspeed of the aircraft. The EDR values given above describe the severity levels for a medium-sized transport aircraft under typical en-route conditions (i.e. altitude, airspeed and weight).*~~

2.6.3 Special air-reports

Special air-reports on turbulence shall be made during any phase of the flight whenever the peak value ~~of the cube root~~ of EDR equals or exceeds ~~0.4~~0.20. The special air-report on turbulence shall be made with reference to the 1-minute period immediately preceding the observation. Both the average and peak value of turbulence shall be observed. The average and peak values shall be reported in terms ~~of the cube~~ root of EDR. Special air-reports shall be issued every minute until such time as the peak values ~~of the cube root~~ of EDR fall below ~~0.4~~0.20.

…

3. EXCHANGE OF AIR-REPORTS

3.1 Responsibilities of the meteorological watch offices

3.1.1 The meteorological watch office shall transmit without delay the special air reports received by voice communications to WAFCs and the ~~centres~~ centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

…

3.2 Responsibilities of world area forecast ~~centres~~ centers

…

Table A3.4-1. Template for the special air-report (downlink)

Element as specified in Chapter	*Detailed content*	*Template(s)*	*Examples*
Message type designator (M)	Type of air-report (M)	ARS	ARS
...	…	…	…
DATA BLOCK 1			
Latitude (M)	Latitude in degrees and minutes (M)	Nnnnn *or* Snnnn	S4506
…	…	…	…
DATA BLOCK 2			
Wind direction (M)	Wind direction in degrees true (M)	nnn/	262/
...	…	…	…
DATA BLOCK 3			
Condition prompting the issuance of a special air-report (M)		SEV TURB [EDRnnn][2] *or* SEV ICE *or* SEV MTW *or* TS GR[3] *or* TS[3] *or* HVY DS[4] *or* HVY SS[4] *or* VA CLD [FLnnn/nnn] *or* VA[5] [MT nnnnnnnnnnnnnnnnnnnn] *or* MOD TURB [EDRnnn][2] *or* MOD ICE	SEV TURB EDR076

…

APPENDIX 3.5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS

(See CAR-ANS 3.6.)

1. CRITERIA RELATED TO TAF

1.1 TAF format

…

~~1.1.2 Until 4 November 2020, TAF shall be disseminated, in IWXXM GML form, in addition to the dissemination of the TAF in accordance with 1.1.1.~~

~~1.1.3~~ 1.1.2 ~~As of 5 November 2020,~~ TAF shall be disseminated in IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes *(WMO-No. 306), Volume I.3, Part D —* Representation Derived from Data Models. *Guidance on the implementation of IWXXM is provided in the* ~~Manual on the Digital Exchange of Aeronautical Meteorological Information~~ Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

1.6 Dissemination of TAF

TAF and amendments thereto shall be disseminated to international OPMET databanks and the ~~centres~~ centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems, in accordance with regional air navigation agreement.

…

4. CRITERIA RELATED TO AREA FORECASTS FOR LOW-LEVEL FLIGHTS

…

4.4 Exchange of area forecasts for low-level flights

4.4.1 Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be exchanged between aerodrome meteorological offices and/or meteorological watch offices responsible for the issuance of flight documentation for low-level flights in the flight information regions concerned.

4.4.2 Area forecasts for low-level flights, in support of international air navigation, prepared in accordance with regional air navigation agreement and in support of the issuance of AIRMET information should be disseminated to the aeronautical fixed service Internet-based services.

…

APPENDIX 3.6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

(See CAR-ANS 3.7)

…

1. SPECIFICATIONS RELATED TO SIGMET INFORMATION

…

1.1 Format of SIGMET messages

…

~~1.1.6 Until 4 November 2020, SIGMET information shall be disseminated in IWXXM GML form, in addition to the dissemination of SIGMET information in accordance with 1.1.1.~~

~~1.1.7~~ 1.1.6 ~~As of 5 November 2020,~~ SIGMET information shall be disseminated in IWXXM GML form in addition to the dissemination of SIGMET information in accordance with 1.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes *(WMO-No. 306), Volume I.3, Part D —* Representation Derived from Data Models. *Guidance on the implementation of IWXXM is provided in the* ~~Manual on the Digital Exchange of Aeronautical Meteorological Information~~ Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

~~1.1.8~~ 1.1.7 SIGMET, when issued in graphical format, shall be as specified in Appendix 3.1, including the use of applicable symbols and/or abbreviations.

…

1.2 Dissemination of SIGMET messages

…

1.2.2 SIGMET messages shall be disseminated to international OPMET databanks and the ~~centres~~ centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with regional air navigation agreement.

…

2. SPECIFICATIONS RELATED TO AIRMET INFORMATION

2.1 Format of AIRMET messages

…

~~2.1.6 Until 4 November 2020, AIRMET information shall be disseminated in IWXXM GML form, in addition to the dissemination of AIRMET information in accordance with 2.1.1.~~

~~2.1.7~~ 2.1.6 ~~As of 5 November 2020,~~ AIRMET information shall be disseminated in IWXXM GML form in addition to the dissemination of AIRMET information in accordance with 2.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes *(WMO-No. 306), Volume I.3, Part D —* Representation Derived from Data Models. *Guidance on the implementation of IWXXM is provided in the* ~~Manual on the Digital Exchange of Aeronautical Meteorological Information~~ Manual on the ICAO Meteorological Information Exchange Model (IWXXM) *(ICAO Doc 10003).*

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

2.2 Dissemination of AIRMET messages

…

2.2.2 AIRMET messages shall be transmitted to international operational meteorological databanks and the ~~centres~~ centers designated by regional air navigation agreement for the

operation of aeronautical fixed service Internet-based services in accordance with regional air navigation agreement.

…

4. DETAILED CRITERIA RELATED TO SIGMET AND AIRMET MESSAGES AND SPECIAL AIR-REPORTS (UPLINK)

…

4.2 Criteria related to phenomena included in SIGMET and AIRMET messages and special air-reports (uplink)

…

4.2.6 Turbulence shall be considered:

a) severe whenever the peak value ~~of the cube root~~ of EDR equals or exceeds ~~0.7~~0.45; and

b) moderate when the peak value ~~of the cube root~~ of EDR is equal to or above ~~0.4~~0.20 and below ~~or equal to 0.7~~0.45.

…

Table A3.6-1A. Template for SIGMET and AIRMET messages ~~and special air-reports (uplink)~~

…

Element	*Detailed content*	*SIGMET template*	*AIRMET template*	*SIGMET message examples*	*AIRMET message examples*
…	…	…	…	…	…
IF THE SIGMET OR AIRMET MESSAGE IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.					
…	…	…	…	…	…
Observed or forecast phenomenon (M)[20,21]	Indication whether the information is observed and expected to continue, *or* forecast	OBS [AT nnnnZ] *or* FCST [AT nnnnZ]		OBS OBS AT 1210Z FCST FCST AT 1815Z	
Location (C) [20,21,33]	Location (referring to latitude and longitude (in degrees and minutes))	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn]		N2020 W07005 N48 E010 S60 W160 S0530 E16530 N OF N50 S OF N5430 N OF S10 S OF S4530 W OF W155 E OF W45 W OF E15540 E OF E09015 N OF N1515 AND W OF E13530 S OF N45 AND N OF N40 N OF LINE S2520 W11510 – S2520 W12010 SW OF LINE N50 W005 – N60 W020	

		or N OF LINE[21] *or* NE OF LINE[21~~22~~] *or* E OF LINE[21] *or* SE OF LINE[21~~22~~] *or* S OF LINE[21~~22~~] *or* SW OF LINE[21~~22~~] *or* W OF LINE[21~~22~~] *or* NW OF LINE[21~~22~~] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [AND N OF LINE[21~~22~~] *or* NE OF LINE[21~~22~~] *or* E OF LINE[21~~22~~] *or* SE OF LINE[21~~22~~] *or* S OF LINE[21~~22~~] *or* SW OF LINE[21~~22~~] *or* W OF LINE[21~~22~~] *or* NW OF LINE[21~~22~~] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]] *or* WI[21~~22~~,~~22~~23] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – [Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* APRX nnKM WID LINE[21~~22~~] BTN (*or* nnNM WID LINE[21~~22~~] BTN) Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* ENTIRE FIR[/]UIR *or* ENTIRE FIR *or* ENTIRE FIR/UIR *or* ENTIRE CTA *or*[23~~24~~]	SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550 APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010 ENTIRE FIR ENTIRE UIR ENTIRE FIR/UIR ENTIRE CTA WI 400KM OF TC ~~CENTRE~~ CENTER WI 250NM OF TC ~~CENTRE~~ CENTER WI 30KM OF N6030 E02550†

		WI nnnKM (*or* nnnNM) OF TC ~~CENTRE~~ CENTER *or*~~24~~25 WI nnKM (*or* nnNM) OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn[nn]	
Level (C)[20, 21~~24~~]	Flight level *or* altitude	[SFC/]FLnnn or [SFC/]nnnnM (*or* [SFC/][n]nnnnFT) *or* FLnnn/nnn *or* TOP FLnnn *or* [TOP] ABV FLnnn *or* (or [TOP] ABV [n]nnnnFT) [nnnn/]nnnnM (*or* [[n]nnnn/][n]nnnnFT) *or* [nnnnM/]FLnnn (*or* [[n]nnnnFT/]FLnnn) *or* ~~23~~24 TOP [ABV *or* BLW] FLnnn	FL180 SFC/FL070 SFC/3000M SFC/10000FT FL050/080 TOP FL390 ABV FL250 TOP ABV FL100 ABV 7000FT TOP ABV 9000FT TOP ABV 10000FT 3000M 2000/3000M 8000FT 6000/12000FT 2000M/FL150 10000FT/FL250 TOP FL500 TOP ABV FL500 TOP BLW FL450
Movement or expected movement (C) [20, ~~25~~ 26, 34]	Movement *or* expected movement (direction and speed) with reference to one of the sixteen points of compass, *or* stationary	MOV N [nnKMH] *or* MOV NNE [nnKMH] *or* MOV NE [nnKMH] *or* MOV ENE [nnKMH] *or* MOV E [nnKMH] *or* MOV ESE [nnKMH] *or* MOV SE [nnKMH] *or* MOV SSE [nnKMH] *or* MOV S [nnKMH] *or* MOV SSW [nnKMH] *or* MOV SW [nnKMH] *or* MOV WSW [nnKMH] *or* MOV W [nnKMH] *or* MOV WNW [nnKMH] *or* MOV NW [nnKMH] *or* MOV NNW [nnKMH] (*or* MOV N [nnKT] *or* MOV NNE [nnKT] *or* MOV NE [nnKT] *or* MOV ENE [nnKT] *or* MOV E [nnKT] *or* MOV ESE [nnKT] *or* MOV SE [nnKT] *or* MOV SSE [nnKT] *or* MOV S [nnKT] *or* MOV SSW [nnKT] *or* MOV SW [nnKT] *or* MOV WSW [nnKT] *or* MOV W [nnKT] *or* MOV WNW [nnKT] *or* MOV NW [nnKT] *or* MOV NNW [nnKT])	MOV SE MOV NNW MOV E 40KMH MOV E 20KT MOV WSW 20KT STNR

		or STNR			
Changes in intensity (C)[20]	Expected changes in intensity	INTSF or WKN *or* NC		INTSF WKN NC	
Forecast time (C)24	Indication of the forecast time of phenomenon	FCST AT nnnnZ	—	FCST AT 2200Z	—
TC forecast position (C)~~23~~24	Forecast position of TC ~~centre~~ center ~~at the end of the validity period of the SIGMET message~~	TC ~~CENTRE~~ CENTER PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] *or*[31] TC CENTER PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB	—	TC ~~CENTRE~~ CENTER PSN N1030 E16015 TC ~~CENTRE~~ CENTER PSN N105 E15030~~600015~~ CB	—
Forecast position ©[20, 21] ~~25, 26~~, 27, 33	Forecast position of phenomenon at the end of the validity period of the SIGMET message[32]	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn] *or* N OF LINE~~21~~22 *or*	—	N30 W170 N OF N30 S OF S50 AND W OF E170 S OF N46 AND N OF N39 NE OF LINE N35 W020 – N45 W040 SW OF LINE N48 W020 – N43 E010 AND NE OF LINE N43 W020 – N38 E010 WI N20 W090 – N05 W090 – N10 W100 – N20 W100 – N20 W090 APRX 50KM WID LINE BTN N64 W017 – N57 W005 – N55 E010 – N55 E030 ENTIRE FIR ENTIRE UIR ENTIRE FIR/UIR ENTIRE CTA	—

		NE OF LINE[~~21~~22] *or* E OF LINE[~~21~~22] *or* SE OF LINE[~~21~~22] *or* S OF LINE[~~21~~22] *or* SW OF LINE[~~21~~22] *or* W OF LINE[~~21~~22] *or* NW OF LINE[~~21~~22] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [AND N OF LINE[~~21~~22] *or* NE OF LINE[~~21~~22] *or* E OF LINE[~~21~~22] *or* SE OF LINE[~~21~~22] *or* S OF LINE[~~21~~22] *or* SW OF LINE[~~21~~22] *or* W OF LINE[~~21~~22] *or* NW OF LINE[~~21~~22]Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]] *or* WI[21,22]Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] –		NO VA EXP WI 30KM OF N6030 E02550 † WI 150NM OF TC CENTER	

		Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] *or* APRX nnKM WID LINE[21][22] BTN (nnNM WID LINE[21][22] BTN) Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* ENTIRE FIR *or* ENTIRE UIR *or* ENTIRE FIR/UIR *or* ENTIRE CTA *or*[27][28] NO VA EXP *or*[24][25] WI nnKM (*or* nnNM) OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn[nn] *or*[24] WI nnnKM (nnnNM) OF TC CENTER			
Repetition of elements (C)[28][29]	Repetition of elements included in a SIGMET message for	[AND][28][29]	—	AND	—

	volcanic ash cloud or tropical cyclone				
OR					
Cancellation of SIGMET/ AIRMET (C)~~29~~30	Cancellation of SIGMET/AIRMET referring to its identification	CNL SIGMET [n][n]n nnnnnn/nnnnnn *or*~~27~~28 CNL SIGMET [n][n]n nnnnnn/nnnnnn VA MOV TO nnnn FIR	CNL AIRMET [n][n]n nnnnnn/nnnnnn	CNL SIGMET 2 101200/101600 CNL SIGMET A13 251030/251430 VA MOV TO YUDO FIR[2]	CNL AIRMET 05 151520/151800

Notes.—

…

20. In the case of volcanic ash cloud ~~or cumulonimbus clouds associated with a tropical cyclone~~ covering more than one area within the FIR, these elements can be repeated, as necessary. Each location and forecast position is to be preceded by an observed or forecast time.

21. In the case of cumulonimbus clouds associated with a tropical cyclone covering more than one area within the FIR, these elements can be repeated as necessary. Each location and forecast position must be preceded by an observed or forecast time.

~~21~~22. A straight line is to be used between two points drawn on a map in the Mercator projection or between two points which crosses lines of longitude at a constant angle.

~~22~~23. The number of coordinates ~~should~~ are to be kept to a minimum and should not normally exceed seven.

~~23~~24. Only for SIGMET messages for tropical cyclones.

~~24~~25. Only for SIGMET messages for radioactive cloud. When detailed information on the release is not available, a radius of up to 30 kilometers (or 16 nautical miles) from the source ~~may~~ can be applied; and a vertical extent from surface (SFC) to the upper limit of the flight information region/upper flight information region (FIR/UIR) or control area (CTA) is to be applied. [Applicable from 7 November 2019 until 4 November 2020]

26. Only for SIGMET messages for radioactive cloud. A radius of up to 30 kilometers (or 16 nautical miles) from the source; and a vertical extent from surface (SFC) to the upper limit of the flight information region/upper flight information region (FIR/UIR) or control area (CTA) is to be applied. [Applicable 5 November 2020]

~~25~~27. The elements "forecast time" and "forecast position" are not to be used in conjunction with the element "movement or expected movement".

~~26~~28. The levels of the phenomena remain fixed throughout the forecast period.

~~27~~29. Only for SIGMET messages for volcanic ash.

~~28~~30. To be used for ~~two~~ more than one volcanic ash clouds or ~~two centres of tropical cyclones~~ cumulonimbus clouds associated with a tropical cyclone simultaneously affecting the FIR concerned.

~~29~~31. End of the message (as the SIGMET/AIRMET message is being cancelled).

32. The term CB is to be used when the forecast position for the cumulonimbus cloud is included.

33. The forecast position for cumulonimbus (CB) cloud occurring in connection with tropical cyclones relate to the forecast time of the tropical cyclone center position, not to the end of the validity period of the SIGMET message.

34. For SIGMET messages for radioactive cloud, only within (WI) is to be used for the elements "location" and "forecast position".

35. For SIGMET messages for radioactive cloud, only stationary (STNR) is to be used for the element "movement or expected movement".

Table A3.6-1B. Template for special air-reports (uplink)

Key: M = inclusion mandatory, part of every message;

C = inclusion conditional, included whenever applicable;

= = a double line indicates that the text following it should be placed on the subsequent line.

Note.— The ranges and resolutions for the numerical elements included in special air-reports are shown in Table A6-4 of this appendix.

Element	*Detailed*	*Template [1,2]*	*Examples*
Identification (M)	Message identification	ARS	ARS
Aircraft Identification (M)	Aircraft radiotelephony call sign	nnnnnn	VA812[3]
Observed phenomenon (M)	Description of observed phenomenon causing the issuance of the special air-report[4]	TS TSGR SEV TURB SEV ICE SEV MTW HVY DS HVY SS VA CLD VA [MT nnnnnnnnnn] MOD TURB	TS TSGR SEV TURB SEV ICE SEV MTW HVY DS HVY SS VA CLD VA VA MT ASHVAL[5] MOD TURB MOD ICE

		MOD ICE	
Observation time (M)	Time of observation of observed phenomenon	OBS AT nnnnZ	OBS AT 1210Z
Observed Location (C)	Location (referring to latitude and longitude (in degrees and minutes)) of observed phenomenon	NnnnnWnnnnn *or* NnnnnEnnnnn *or* SnnnnWnnnnn *or* SnnnnEnnnnn	N2020W07005 S4812E01036
Observed Level (C)	Flight level *or* altitude of observed phenomenon	FLnnn *or* FLnnn/nnn *or* nnnnM (*or* [n]nnnnFT)	FL390 FL180/210 3000M 12000FT

Notes.—

1. No wind and temperature to be uplinked to other aircraft in flight in accordance with 3.2.

2. See 3.1.

3. Fictitious call sign.

4. In the case of special air-report for volcanic ash cloud, the vertical extent (if observed) and name of the volcano (if known) can be used.

5. Fictitious location.

…

Example A3.6-4. SIGMET message for radioactive cloud

YUCC SIGMET 2 VALID 201200/201600 YUDO –
YUCC AMSWELL FIR RDOACT CLD OBS AT 1155Z WI 30KM OF N6030 E02550 SFC/FL550 STNR ~~S5000 W14000 – S5000 W13800 – S5200 W13800 – S5200 W14000 – S5000 W14000 SFC/FL100 STNR WKN FCST AT 1600Z WI S5200 W14000 – S5200 W13800 – S5300 W13800 – S5300 W14000 – S5200 W14000~~

Meaning:

The second SIGMET message issued for the AMSWELL* flight information region (identified by YUCC Amswell area control ~~centre~~ center) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1200 UTC to 1600 UTC on the 20th of the month; radioactive cloud was observed at 1155 UTC within 30 kilometers of 60 degrees 30 minutes north 25 degrees 50 minutes east between the surface and flight level 550. The radioactive cloud is stationary ~~an area bounded by 50 degrees 0 minutes south 140 degrees 0 minutes west to 50 degrees 0 minutes south 138 degrees 0 minutes west to 52 degrees 0 minutes south 138 degrees 0 minutes west to 52 degrees 0 minutes south 140 degrees 0 minutes west to 50 degrees 0 minutes south 140 degrees 0 minutes west and between the surface and flight level 100; the radioactive cloud is expected to remain stationary and to weaken in intensity.~~

* Fictitious location

…

APPENDIX 3.8. TECHNICAL SPECIFICATIONS RELATED TO SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

(See CAR-ANS 3.9.)

…

2. SPECIFICATIONS RELATED TO INFORMATION FOR PRE-FLIGHT PLANNING AND IN-FLIGHT REPLANNING

…

2.2 Format of information on significant weather

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

Note.— The BUFR code form is contained in WMO Publication No. 306, Manual on Codes, Volume I.2, Part B — Binary Codes.

2.2.2 As of 4 November 2021, in addition to 2.2.1, information on significant weather supplied by WAFCs for pre-flight planning and in-flight replanning shall be in IWXXM GML form.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

4.2 Charts in flight documentation

4.2.1 Characteristics of charts

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

…

g) labels on the charts for flight documentation shall be clear and simple and shall present the name of the world area forecast ~~centre~~ center or, for non-WAFS products, the originating ~~centre~~ center, the type of chart, date and valid time and, if necessary, the types of units used in an unambiguous way.

Note.— When plotting shapes, particularly polygons, on maps, appropriate corrections are necessary if plotted on projections different to that used in the production of the original forecast area.

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

…

c) wind and temperature data selected from the data sets received from a world area forecast ~~centre~~ center shall be depicted in a sufficiently dense latitude/longitude grid; and

…

APPENDIX 3.9. TECHNICAL SPECIFICATIONS RELATED TO INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

(See CAR-ANS 3.10.)

1. INFORMATION TO BE PROVIDED FOR AIR TRAFFIC SERVICES UNITS

…

1.3 List of information for the area control ~~centre~~ center and flight information ~~centre~~ center

The following meteorological information shall be supplied, as necessary, to an area control ~~centre~~ center or a flight information ~~centre~~ center by its associated meteorological watch office:

a) METAR and SPECI, including current pressure data for aerodromes and other locations, TAF and trend forecasts and amendments thereto, covering the flight information region or the control area and, if required by the flight information ~~centre~~ center or area control ~~centre~~, center covering aerodromes in neighboring flight information regions, as determined by regional air navigation agreement;

b) forecasts of upper winds, upper-air temperatures and significant en-route weather phenomena and amendments thereto, particularly those which are likely to make operation under visual flight rules impracticable, SIGMET and AIRMET information and appropriate special air-reports for the flight information region or control area and, if determined by regional air navigation agreement and required by the flight information ~~centre~~ center or area control ~~centre~~, center for neighboring flight information regions;

c) any other meteorological information required by the flight information ~~centre~~ center or area control ~~centre~~ center to meet requests from aircraft in flight; if the information requested is not available in the associated meteorological watch office, that office shall request the assistance of another meteorological office in supplying it;

…

1.4 Supply of information to aeronautical telecommunications stations

Where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to designated aeronautical telecommunication stations. A copy of such information shall be forwarded, if required, to the flight information ~~centre~~ center or the area control ~~centre~~ center.

…

2. INFORMATION TO BE PROVIDED FOR SEARCH AND RESCUE SERVICES UNITS

2.1 List of information

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

…

2.2 Information to be provided on request

2.2.1 On request from the rescue coordination ~~centre~~, center, the designated meteorological office shall arrange to obtain details of the flight documentation which was supplied to the missing aircraft, together with any amendments to the forecast which were transmitted to the aircraft in flight.

…

2.2.3 On request from the rescue coordination ~~centre~~, center, the designated meteorological office shall supply or arrange for the supply of meteorological information required by ships undertaking search and rescue operations.

…

3. INFORMATION TO BE PROVIDED FOR AERONAUTICAL INFORMATION SERVICES UNITS

3.1 List of information

The following information shall be supplied, as necessary, to an aeronautical information services unit:

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

Note.— Details of this information are given in the ~~Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066),~~ Manual of Standards for Aeronautical Information Services (MOS-AIS), Appendix 3, Part 1, GEN 3.5 and Part 3, AD 2.2, 2.11, 3.2 and 3.11.

…

APPENDIX 3.10. TECHNICAL SPECIFICATIONS RELATED TO REQUIREMENTS FOR AND USE OF COMMUNICATIONS

(See CAR-ANS 3.11.)

1. SPECIFIC REQUIREMENTS FOR COMMUNICATIONS

1.1 Required transit times of operational meteorological information

~~AFTN m~~Messages and bulletins containing operational meteorological information shall achieve transit times of less than 5 minutes, unless otherwise determined to be lower by regional air navigation agreement.

1.2 Grid point data for ATS and operators

…

1.2.2 When upper-air data for grid points in digital form are made available to operators for flight planning by computer, the transmission arrangements shall be as agreed among the world area forecast ~~centre~~ center concerned, the meteorological authority and the operators concerned.

2. USE OF AERONAUTICAL FIXED SERVICE COMMUNICATIONS AND THE PUBLIC INTERNET

2.1 Meteorological bulletins in alphanumeric format

…

2.1.4 ~~Structure~~ Transmission of bulletins containing operational meteorological information

Meteorological bulletins containing operational meteorological information ~~to~~ shall be transmitted via the ~~AFTN~~ aeronautical fixed service (AFS) ~~shall be encapsulated in the text part of the AFTN message format~~.

…

ATTACHMENT 3.E. SPATIAL RANGES AND RESOLUTIONS FOR SPACE WEATHER ADVISORY INFORMATION
~~(See Appendix 3.2, 6.1 of CAR-ANS Part 3)~~ (RESERVED)

~~*Element to be forecast*~~		~~*Range*~~	~~*Resolution*~~
~~Flight level affected by radiation~~		~~250 – 600~~	~~30~~
~~Longitudes for advisories (degrees)~~		~~000 – 180~~	~~15~~
~~Latitudes for advisories (degrees)~~		~~00 – 90~~	~~10~~
~~Latitude bands for advisories:~~	~~High latitudes northern hemisphere (HNH)~~	~~N9000 – N6000~~	~~30~~
	~~Middle latitudes northern hemisphere (MNH)~~	~~N6000 – N3000~~	
	~~Equitorial latitudes northern hemisphere (EQN)~~	~~N3000 – N0000~~	
	~~Equitorial latitudes sourthern hemisphere (EQS)~~	~~S0000 – S3000~~	
	~~Middle latitudes sourthern hemisphere (MSH)~~	~~S3000 – S6000~~	
	~~High latitudes sourthern hemisphere (HSH)~~	~~S6000 – S9000~~	

— END —

NEW/AMENDED REGULATION AFTER REVISION:

CAR-ANS PART 3 Governing Aeronautical Meteorological Service

…

3.1 Definitions

…

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

…

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

…

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

…

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

…

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

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

…

Space weather center (SWXC). A center designated to monitor and provide advisory information on space weather phenomena expected to affect high-frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems and/or pose a radiation risk to aircraft occupants.

Note.— A space weather center is designated as global and/or regional.

…

State volcano observatory. A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control center/flight information center meteorological watch office and volcanic ash advisory center.

…

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

…

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

…

World area forecast center (WAFC). A meteorological center designated to prepare and issue significant weather forecasts and upper-air forecasts in digital form on a global basis direct to States using the aeronautical fixed service Internet-based services.

…

3.2 GENERAL PROVISIONS

…

3.2.1 Objective, determination and provision of meteorological service

…

3.2.1.4 The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) as the country's designated Meteorological Authority, in coordination with the Civil Aviation Authority of the Philippines (CAAP), hereby assumed the mandate to provide or to arrange for the provision of meteorological service for air navigation on its behalf. Details of the meteorological authority so designated shall be included in the aeronautical information publication (AIP).

Note.— Detailed specifications concerning presentation and contents of the aeronautical information publication is provided in the Procedures for Air Navigation Services — Aeronautical Information Management *Manual of Standards for Aeronautical Information Services (MOS-AIS), Appendix 2.*

…

3.2.2 Supply, quality assurance and use of meteorological information

…

3.2.2.3 The quality system established in accordance with 3.2.2.2 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 program. The details of a successful program 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 system 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)*.

…

CHAPTER 3.3. GLOBAL SYSTEMS, SUPPORTING CENTERS AND METEOROLOGICAL OFFICES

3.3.1 Aerodrome meteorological offices

3.3.1.1 The designated Meteorological Authority 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.

3.3.1.2 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:

…

3.3.1.3 The aerodromes for which landing forecasts are required shall be determined by designated meteorological authority.

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

…

3.3.2 Meteorological watch offices

3.3.2.1 The CAAP, having accepted the responsibility for providing air traffic services within a flight information region or a control area, shall arrange with PAGASA for the establishment and/or operation of one or more meteorological watch offices.

…

3.3.2.2 A meteorological watch office shall:

…

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 WMO regional specialized meteorological centers (RSMC) for the provision of transport model products for radiological environmental emergency response, at the request of PAG-ASA 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.

3.3.2.3 The boundaries of the area over which meteorological watch is to be maintained by a meteorological watch office shall be coincident with the boundaries of a flight information region or a control area or a combination of flight information regions and/or control areas.

3.3.2.4 An MWO shall coordinate SIGMET with neighboring MWO(s), especially when the en-route 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 (ICAO Doc 8896).

3.3.3 Philippine volcano observatories

The Philippines with active or potentially active volcanoes shall maintain volcano observatories through PHIVOLCS to monitor active or potentially active volcanoes and shall arrange that selected PHIVOLCS volcano observatories, as designated by regional air navigation agreement, observe significant pre-eruption volcanic activity, volcanic eruption and/or volcanic ash in the atmosphere and shall send this information as quickly as practicable to its associated ACC/FIC, MWO and VAAC.

3.3.4 Space weather centers
(RESERVED)

…

3.5 AIRCRAFT OBSERVATIONS AND REPORTS

…

3.5.8 Relay of air-reports by ATS units

The meteorological authority concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of:

…

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

…

3.7 SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS

…

3.7.1 SIGMET Information

…

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

…

3.9 SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

3.9.1 General provisions

…

3.9.1.3 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:

…

i) meteorological satellite images; and

j) ground-based weather radar information.

…

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

…

3.9.4.2 Automated pre-flight information systems providing for a harmonized, common point of access to meteorological information and aeronautical information services by operators, flight crew members and other aeronautical personnel concerned shall be as agreed between the meteorological authority and the relevant civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with CAR-ANS Part 15, 15.2.1.1 c).

Note.— The meteorological and aeronautical information services information concerned is specified in 3.9.1 to 3.9.3 and Appendix 3.8 and in the Manual of Standards for Aeronautical Information Services (MOS-AIS), 5.5, respectively.

…

3.10 INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

…

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

…

3.11 REQUIREMENTS FOR AND USE OF COMMUNICATIONS

…

3.11.1 Requirements for communications

…

3.11.1.2 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 center, area control centers and rescue coordination center and the associated aeronautical telecommunications stations.

…

3.11.1.9 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 Centers, providing for global coverage are used to support the global exchanges of operational meteorological information.

…

APPENDIX 3.1 FLIGHT DOCUMENTATION — MODEL CHARTS AND FORMS

…

MODEL TCG Tropical cyclone advisory information in graphical format

MODEL VAG Volcanic ash advisory information in graphical format
Example 1. Mercator projection
Example 2. Polar stereographic projection

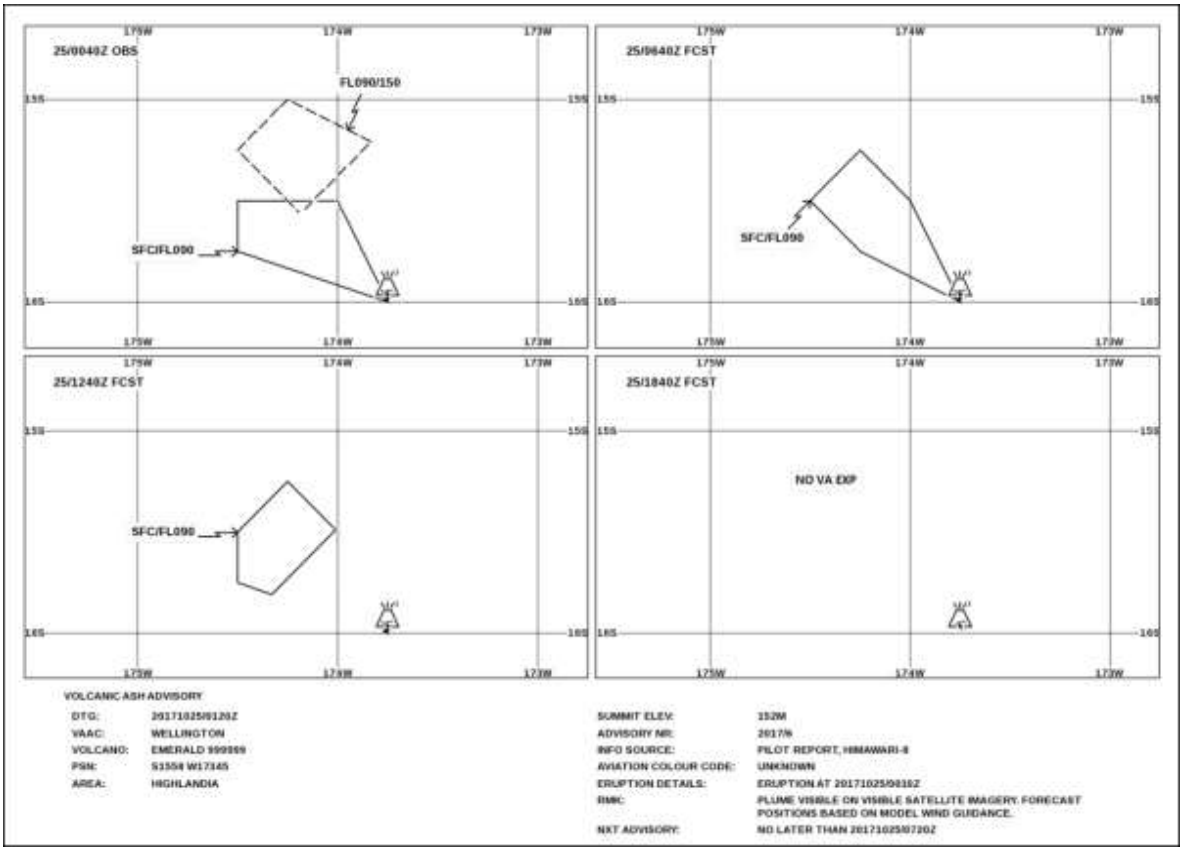
MODEL STC SIGMET for tropical cyclone in graphical format

MODEL SVA SIGMET for volcanic ash in graphical format

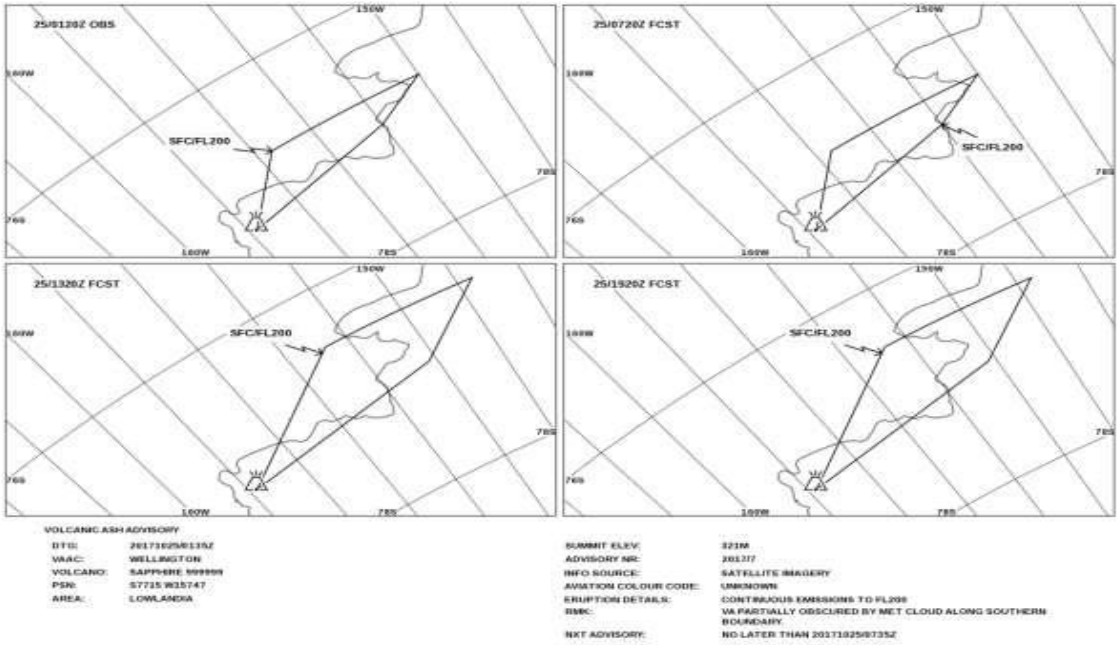
Example 1. Mercator projection
Example 2. Polar stereographic projection

…

VOLCANIC ASH ADVISORY INFORMATION
IN GRAPHICAL FORMAT **MODEL VAG**
Example 1. Mercator projection



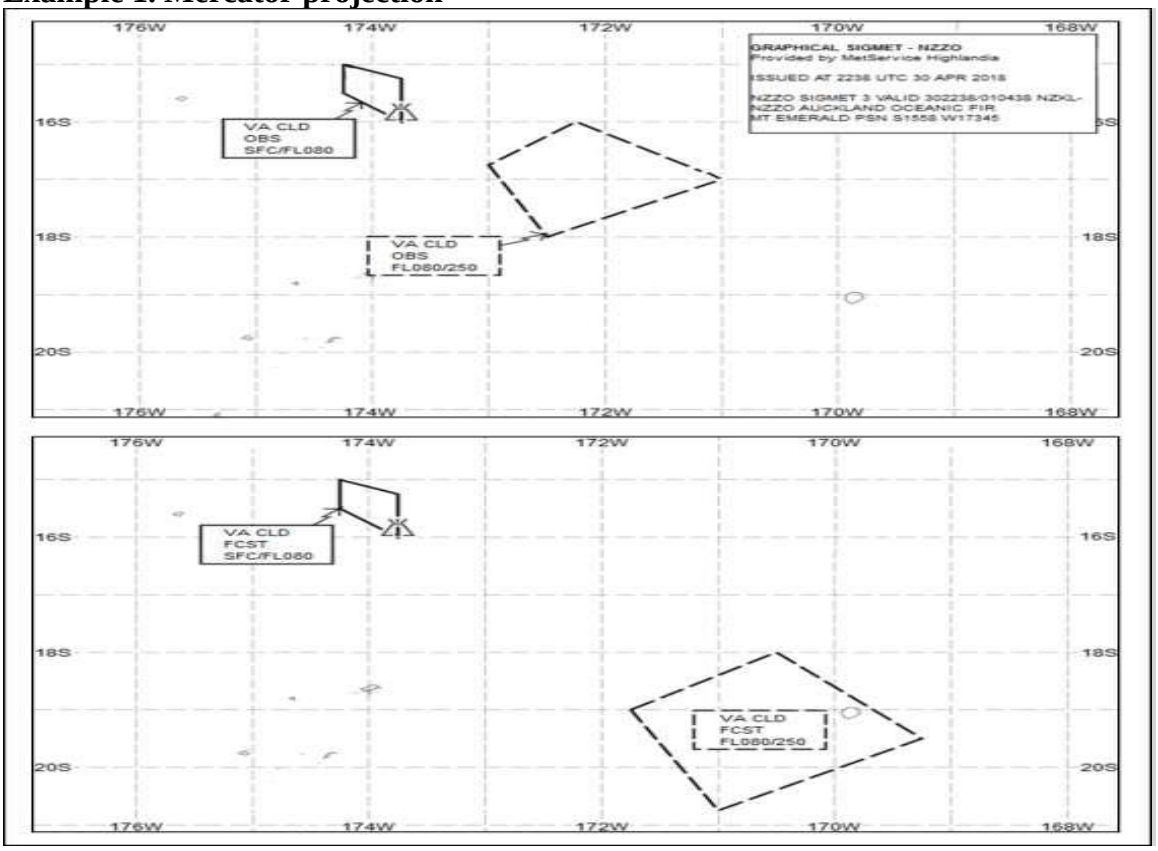
VOLCANIC ASH ADVISORY INFORMATION
IN GRAPHICAL FORMAT **MODEL VAG**
Example 2. Polar stereographic projection



…

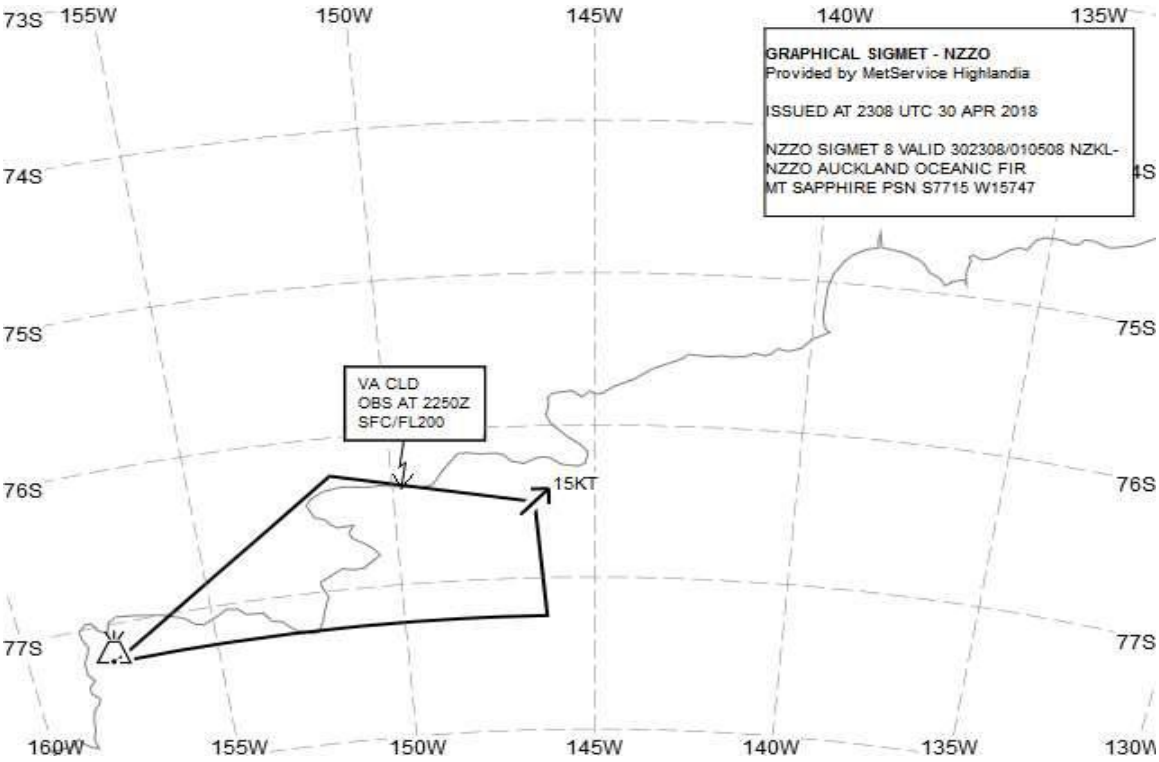
SIGMET FOR VOLCANIC ASH IN GRAPHICAL FORMAT MODEL SVA

Example 1. Mercator projection



SIGMET FOR VOLCANIC ASH
IN GRAPHICAL FORMAT MODEL SVA

Example2. Polar stereographic projection



…

APPENDIX 3.2 TECHNICAL SPECIFICATIONS RELATED TO GLOBAL SYSTEMS, SUPPORTING CENTERS AND METEOROLOGICAL OFFICES

1. Significant weather (SIGWX) forecasts

1.2 General provisions

1.2.1 Forecasts of significant en-route weather phenomena shall be prepared as SIGWX forecasts four times a day by a WAFC and shall be valid for fixed valid times at 24 hours after the time (0000, 0600, 1200 and 1800 UTC) of the synoptic data on which the forecasts were based. Each forecast shall be disseminated as soon as technically feasible but not later than 7 hours after standard time of observation under normal operations and not later than 9 hours after standard time of observation during backup operations.

1.2.2 SIGWX forecasts shall be issued in binary code form using the BUFR code form prescribed by WMO.

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

1.2.3 As of 4 November 2021, in addition to 1.2.2, SIGWX forecasts shall be disseminated in IWXXM GML form.

Note 1.— Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

1.3. Types of SIGWX forecasts

SIGWX forecasts shall be issued as high-level SIGWX forecasts for flight levels between 250 and 630.

Note.— Medium-level SIGWX forecasts for flight levels between 100 and 250 for limited geographical areas will continue to be issued until such time that flight documentation to be generated from the gridded forecasts of cumulonimbus clouds, icing and turbulence fully meets user requirements.

1.4 Items included in SIGWX forecasts

SIGWX forecasts shall include the following items:

…

1.5 Criteria for including items in SIGWX forecasts

The following criteria shall be applied for SIGWX forecasts:

…

2. AERODROME METEOROLOGICAL OFFICES

2.1 Use of WAFS products

…

2.1.2 In order to ensure uniformity and standardization of flight documentation, the WAFS GRIB and BUFR data received and, as of 4 November 2021, IWXXM data received, shall be decoded into standard WAFS charts in accordance with relevant provisions in this CAR-ANS, and the meteorological content and identification of the originator of the WAFS forecasts shall not be amended.

2.2 Notification of WAFC concerning significant discrepancies

Aerodrome meteorological offices using WAFS BUFR or, as of 4 November 2021, IWXXM data shall notify the WAFC concerned immediately if significant discrepancies are detected or reported in respect of WAFS SIGWX forecasts concerning:

…

3. STATE VOLCANO OBSERVATORIES

3.1 Information from State volcano observatories

The information required to be sent by State volcano observatories to their associated ACCs/FICs, MWO and VAAC shall comprise:

…

4. SPACE WEATHER CENTERS
(RESERVED)

…

APPENDIX 3.3 TECHNICAL SPECIFICATIONS RELATED TO METEOROLOGICAL OBSERVATIONS AND REPORTS
(See CAR-ANS 3.4)

…

2. GENERAL CRITERIA RELATED TO METEOROLOGICAL REPORTS

2.1 Format of meteorological reports

…

2.1.3 METAR and SPECI shall be disseminated in IWXXM GML form in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

3. DISSEMINATION OF METEOROLOGICAL REPORTS

3.1 METAR and SPECI

3.1.1 METAR and SPECI shall be disseminated to international OPMET databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite, in accordance with regional air navigation agreement.

…

4.3 Runway visual range

…

4.3.1.2 Runway visual range shall be assessed at a lateral distance from the runway center line of not more than 120 m. The site for observations to be representative of the touchdown zone shall be located about 300 m along the runway from the threshold. The sites for observations to be representative of the mid-point and stop-end of the runway shall be located at a distance of 1 000 to 1 500 m along the runway from the threshold and at a distance of about 300 m from the other end of the runway. The exact position of these sites and, if necessary, additional sites shall be decided after considering aeronautical, meteorological and climatological factors such as long runways, swamps and other fog-prone areas.

…

Table A3.3-2. Template for METAR and SPECI
(As of 5 November 2020)

…

Element as specified	*Detailed content*	*Template(s)*			*Examples*
…	…	…			…
END OF METAR IF THE REPORT IS MISSING.					
Surface wind (M)	Wind direction (M)	nn *or*	VRB		24004MPS VRB01MPS ///10MPS (24008KT) (VRB02KT) 240//KT 19006MPS /////KT (19012KT) 00000MPS (00000KT) 140P49MPS (140P99KT) 12003G09MPS (12006G18KT) 24008G14MPS (24016G28KT) 02005MPS
	Wind speed (M)	[P]nn[*or* //[12]			
	Significant speed variations (C)[3]	G[P]nn[n]			
	Units of measurement (M)	MPS (*or* KT)			
	Significant directional	nnnVnnn	—		
Visibility (M)	Prevailing *or* minimum visibility (M)[5]	nnn *or* ////[12]		C A V O K	0350 //// CAVO K 7000 9999 0800
	Minimum visibility and direction of the minimum visibility	nnnn[N] *or* nnnn[NE] *or* nnnn[E] *or* nnnn[SE] *or* nnnn[S] *or* nnnn[SW] *or* nnnn[W] *or*			2000 1200NW 6000 2800E
Runway visual range (C)[7]	Name of the element (M)	R			R32/0400 R12R/1700 R10/M005 0
	Runway (M)	nn[L]/*or* nn[C]/*or* nn[R]/			
	Runway visual range (M)	[P *or* M]nnnn *or* ////[12]			R16L/0650 R16C/0500 R16L///// R10///// R16R/0450
	Runway visual range past tendency (C)[8]	U, D *or* N			R12/1100U R26/0550N R20/0800D
…	…	…		…	…
Element as specified	*Detailed content*	*Template(s)*			*Examples*

Cloud (M)[14]	Cloud amount and height of cloud base *or* vertical visibility (M)	FEWnnn *or* SCTnnn *or* BKNnnn *or* OVCnnn *or* FEW///[12] *or* SCT///[12] *or* BKN///[12] *or* OVC///[12] *or* ///nnn[12] *or* /////[12]	VVnnn *or* VV///[12]	NSC *or* NCD[12]		FEW015 VV005 OVC030 VV/// NSC SCT010 OVC020 BKN/// ///015
	Cloud type (C)[2]	CB *or* TCU *or* ///[12]	—			BKN009TCU NCD SCT008 BKN025CB BKN025/// /////CB //////// BKN///TCU
Air and dew-point temperature (M)	Air and dew-point temperature (M)	[M]nn/[M]nn *or* ///[M]nn[12] *or* [M]nn///[12] *or* /////[12]				17/10 ///10 17/// ///// 02/M08 M01/M10
Pressure values (M)	Name of the element (M)	Q				Q0995 Q1009 Q1022 Q//// Q0987
	QNH (M)	nnnn *or* ////[12]				
Supplementary information (C)	Recent weather (C)2, 9	RERASN *or* REFZDZ *or* REFZRA *or* REDZ *or* RE[SH]RA *or* RE[SH]SN *or* RESG *or* RESHGR *or* RESHGS *or* REBLSN *or* RESS *or* REDS *or* RETSRA *or* RETSSN *or* RETSGR *or* RETSGS *or* RETS *or* REFC *or* REVA *or* REPL *or* REUP[12] *or* REFZUP12 *or* RETSUP12 *or* RESHUP[12] *or* *RE//*[12]				REFZRA RETSRA
	Wind shear (C)[2]	WS Rnn[L] *or* WS Rnn[C] *or* WS Rnn[R] *or* WS ALL RWY				WS R03 WS ALL RWY WS R18C
	Sea-surface temperature and state of the sea *or* significant wave height (C)[15]	W[M]nn/Sn or W///Sn or W[M]nn/S/ or W[M]nn/Hn[n][n] or W///Hn[n][n] or W[M]nn/H///				W15/S2 W12/H75 W///S3 WM01/S/ W///H104 W17/H/// W///H/// W///S/
Trend forecast (O)[16]	Change indicator (M)[17]	NOSIG	BECMG *or* TEMPO			NOSIG BECMG FEW020 TEMPO 25018G25MPS (TEMPO 25036G50KT) BECMG FM1030 TL1130 CAVOK BECMG TL1700 0800 FG BECMG AT1800 9000 NSW BECMG FM1900 0500 +SNRA BECMG FM1100 SN TEMPO FM1130 BLSN TEMPO FM0330 TL0430 FZRA
	Period of change (C)[2]		FMnnnn *and/or* TLnnnn *or* ATnnnn			
	Wind (C)[2]		nnn[P]nn[n][G[P]nn[n]]MPS (*or* nnn[P]nn[G[P]nn]KT)			
	Prevailing visibility (C)[2]		nnnn		CAVO	
	Weather phenomenon: intensity (C)[10]		– *or* +	—	NS	

	Weather phenomenon: characteristics and type (C)[2, 9, 11]		DZ *or* RA *or* SN *or* SG *or* PL *or* DS *or* SS *or* FZDZ *or* FZRA *or* SHGR *or* SHGS *or* SHRA *or* SHSN *or* TSGR *or* TSGS *or* TSRA *or* TSSN	FG *or* BR *or* SA *or* DU *or* HZ *or* FU *or* VA *or* SQ *or* PO *or* FC *or* TS *or* BCFG *or* BLDU *or* BLSA *or* BLSN *or* DRDU *or* DRSA *or* DRSN *or* FZFG *or* MIFG *or*	W	K	TEMPO TL1200 0600 BECMG AT1200 8000 NSW NSC BECMG AT1130 OVC010 TEMPO TL1530 +SHRA BKN012CB
	Cloud amount and height of cloud base *or* vertical visibility (C)[2, 14]		FEWnnn *or* SCTnnn *or* BKNnnn *or* OVCnnn	VVnnn *or* VV///	N S C		
	Cloud type (C)[2,14]		CB *or* TCU	—			
…	…	…	…	…	…	…	…

Notes.—

…

12. When a meteorological element is temporarily missing, or its value considered temporarily as incorrect, it is replaced by "/" for each digit of the abbreviation of the text message and indicated as missing for its IWXXM version.

…

16. To be included in accordance with Chapter 6, 6.3.2.

17. Number of change indicators to be kept to a minimum in accordance with Appendix 5, 2.2.1, normally not exceeding three groups.

…

APPENDIX 3.4. TECHNICAL SPECIFICATIONS RELATED TO AIRCRAFT OBSERVATIONS AND REPORTS

…

2. CRITERIA FOR REPORTING

…

2.6 Turbulence

The turbulence shall be reported in terms of the eddy dissipation rate (EDR).

Note.— The EDR is an aircraft-independent measure of turbulence. However, the relationship between the EDR value and the perception of turbulence is a function of aircraft type, and the mass, altitude, configuration and airspeed of the aircraft. The EDR values given below describe the severity levels for a medium-sized transport aircraft under typical en-route conditions (i.e. altitude, airspeed and weight).

2.6.1 Routine air-reports

The turbulence shall be reported during the en-route phase of the flight and shall refer to the 15-minute period immediately preceding the observation. Both the average and peak value of turbulence, together with the time of occurrence of the peak value to the nearest minute, shall be observed. The average and peak values shall be reported in terms of EDR. The time of

occurrence of the peak value shall be reported as indicated in Table A3.4-2. The turbulence shall be reported during the climb-out phase for the first 10 minutes of the flight and shall refer to the 30-second period immediately preceding the observation. The peak value of turbulence shall be observed.

2.6.2 Interpretation of the turbulence report

Turbulence shall be considered:

a) severe when the peak value of EDR equals or exceeds 0.45;

b) moderate when the peak value of EDR is equal to or above 0.20 and below 0.45;

c) light when the peak value of EDR is above 0.10 and below 0.20; and

d) nil when the peak value of EDR is below or equal to 0.10.

2.6.3 Special air-reports

Special air-reports on turbulence shall be made during any phase of the flight whenever the peak value of EDR equals or exceeds 0.20. The special air-report on turbulence shall be made with reference to the 1-minute period immediately preceding the observation. Both the average and peak value of turbulence shall be observed. The average and peak values shall be reported in terms root of EDR. Special air-reports shall be issued every minute until such time as the peak values of EDR fall below 0.20.

…

3. EXCHANGE OF AIR-REPORTS

3.1 Responsibilities of the meteorological watch offices

3.1.1 The meteorological watch office shall transmit without delay the special air reports received by voice communications to WAFCs and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services.

…

3.2 Responsibilities of world area forecast centers

Table A3.4-1. Template for the special air-report (downlink)

Element as specified in Chapter 5	*Detailed content*	*Template(s)*	*Examples*
Message type designator (M)	Type of air-report (M)	ARS	ARS
...	…	…	…
DATA BLOCK 1			
Latitude (M)	Latitude in degrees and minutes (M)	Nnnnn *or* Snnnn	S4506
…	…	…	…
DATA BLOCK 2			
Wind direction (M)	Wind direction in degrees true (M)	nnn/	262/
...	…	…	…
DATA BLOCK 3			

Condition prompting the issuance of a special air-report (M)		SEV TURB [EDRnnn][2] *or* SEV ICE *or* SEV MTW *or* TS GR[3] *or* TS[3] *or* HVY DS[4] *or* HVY SS[4] *or* VA CLD [FLnnn/nnn] *or* VA[5] [MT nnnnnnnnnnnnnnnnnnnn] *or* MOD TURB [EDRnnn][2] *or* MOD ICE	SEV TURB EDR076

…

APPENDIX 3.5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS

(See CAR-ANS 3.6.)

1. CRITERIA RELATED TO TAF

1.1 TAF format

…

1.1.2 TAF shall be disseminated in IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

1.6 Dissemination of TAF

TAF and amendments thereto shall be disseminated to international OPMET databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution systems, in accordance with regional air navigation agreement.

…

4. CRITERIA RELATED TO AREA FORECASTS FOR LOW-LEVEL FLIGHTS

…

4.4 Exchange of area forecasts for low-level flights

4.4.1 Area forecasts for low-level flights prepared in support of the issuance of AIRMET information shall be exchanged between aerodrome meteorological offices and/or meteorological watch offices responsible for the issuance of flight documentation for low-level flights in the flight information regions concerned.

4.4.2 Area forecasts for low-level flights, in support of international air navigation, prepared in accordance with regional air navigation agreement and in support of the issuance of AIRMET information should be disseminated to the aeronautical fixed service Internet-based services.

…

APPENDIX 3.6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

(See CAR-ANS 3.7)

…

1. SPECIFICATIONS RELATED TO SIGMET INFORMATION

…

1.1 Format of SIGMET messages

…

1.1.6 SIGMET information shall be disseminated in IWXXM GML form in addition to the dissemination of SIGMET information in accordance with 1.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

1.1.7 SIGMET, when issued in graphical format, shall be as specified in Appendix 3.1, including the use of applicable symbols and/or abbreviations.

…

1.2 Dissemination of SIGMET messages

…

1.2.2 SIGMET messages shall be disseminated to international OPMET databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services, in accordance with regional air navigation agreement.

…

2. SPECIFICATIONS RELATED TO AIRMET INFORMATION

2.1 Format of AIRMET messages

…

2.1.6 AIRMET information shall be disseminated in IWXXM GML form in addition to the dissemination of AIRMET information in accordance with 2.1.1.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes (WMO-No. 306), Volume I.3, Part D — Representation Derived from Data Models. Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological information Exchange Model (IWXXM) (ICAO Doc 10003).

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

2.2 Dissemination of AIRMET messages

…

2.2.2 AIRMET messages shall be transmitted to international operational meteorological databanks and the centers designated by regional air navigation agreement for the operation of aeronautical fixed service Internet-based services in accordance with regional air navigation agreement.

…

4. DETAILED CRITERIA RELATED TO SIGMET AND AIRMET MESSAGES AND SPECIAL AIR-REPORTS (UPLINK)

…

4.2 Criteria related to phenomena included in SIGMET and AIRMET messages and special air-reports (uplink)

…

4.2.6 Turbulence shall be considered:

a) severe whenever the peak value of EDR equals or exceeds 0.45; and

b) moderate when the peak of EDR is equal to or above 0.20 and below 0.45.

…

Table A3.6-1A. Template for SIGMET and AIRMET messages

Element	*Detailed content*	*SIGMET template*	*AIRMET template*	*SIGMET message examples*	*AIRMET message examples*
…	…	…	…	…	…
IF THE SIGMET OR AIRMET MESSAGE IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.					
…	…	…	…	…	…
Observed or forecast phenomenon (M)[20,21]	Indication whether the information is observed and expected to continue, *or* forecast	OBS [AT nnnnZ] *or* FCST [AT nnnnZ]		OBS OBS AT 1210Z FCST FCST AT 1815Z	
Location (C) [20,21,33]	Location (referring to latitude and longitude (in degrees and minutes))	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn] *or* N OF LINE[22] *or* NE OF LINE[22] *or* E OF LINE[22] *or* SE OF LINE[22]*or* S OF LINE[22] *or* SW OF LINE[22] *or*W OF LINE[22] *or* NW OF LINE[22] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]		N2020 W07005 N48 E010 S60 W160 S0530 E16530 N OF N50 S OF N5430 N OF S10 S OF S4530 W OF W155 E OF W45 W OF E15540 E OF E09015 N OF N1515 AND W OF E13530 S OF N45 AND N OF N40 N OF LINE S2520 W11510 – S2520 W12010 SW OF LINE N50 W005 – N60 W020 SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550 APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010	

		[– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [AND N OF LINE[22] *or* NE OF LINE[22] *or* E OF LINE[22] *or* SE OF LINE[22]*or* S OF LINE[22] *or* SW OF LINE[22] *or* W OF LINE[22] *or* NW OF LINE[22] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]] *or* WI[22],[23] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – [Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* APRX nnKM WID LINE[22] BTN (*or* nnNM WID LINE[22] BTN) Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* ENTIRE FIR[/]UIR *or* ENTIRE FIR *or* ENTIRE FIR/UIR *or* ENTIRE CTA *or*[24] WI nnnKM (*or* nnnNM) OF TC CENTER *or*[25] WI nnKM (*or* nnNM) OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn[nn]	ENTIRE FIR ENTIRE UIR ENTIRE FIR/UIR ENTIRE CTA WI 400KM OF TC CENTER WI 250NM OF TC CENTER WI 30KM OF N6030 E02550†
Level (C)[20, 21]	Flight level *or* altitude	[SFC/]FLnnn or [SFC/]nnnnM (*or* [SFC/][n]nnnnFT) *or* FLnnn/nnn *or*	FL180 SFC/FL070 SFC/3000M SFC/10000FT

		TOP FLnnn *or* [TOP] ABV FLnnn *or* (or [TOP] ABV [n]nnnnFT) [nnnn/]nnnnM (*or* [[n]nnnn/][n]nnnnFT) *or* [nnnnM/]FLnnn (*or* [[n]nnnnFT/]FLnnn) *or* [24] TOP [ABV *or* BLW] FLnnn		FL050/080 TOP FL390 ABV FL250 TOP ABV FL100 ABV 7000FT TOP ABV 9000FT TOP ABV 10000FT 3000M 2000/3000M 8000FT 6000/12000FT 2000M/FL150 10000FT/FL250 TOP FL500 TOP ABV FL500 TOP BLW FL450	
Movement or expected movement (C) [20, 26, 34]	Movement *or* expected movement (direction and speed) with reference to one of the sixteen points of compass, *or* stationary	MOV N [nnKMH] *or* MOV NNE [nnKMH] *or* MOV NE [nnKMH] *or* MOV ENE [nnKMH] *or* MOV E [nnKMH] *or* MOV ESE [nnKMH] *or* MOV SE [nnKMH] *or* MOV SSE [nnKMH] *or* MOV S [nnKMH] *or* MOV SSW [nnKMH] *or* MOV SW [nnKMH] *or* MOV WSW [nnKMH] *or* MOV W [nnKMH] *or* MOV WNW [nnKMH] *or* MOV NW [nnKMH] *or* MOV NNW [nnKMH] (*or* MOV N [nnKT] *or* MOV NNE [nnKT] *or* MOV NE [nnKT] *or* MOV ENE [nnKT] *or* MOV E [nnKT] *or* MOV ESE [nnKT] *or* MOV SE [nnKT] *or* MOV SSE [nnKT] *or* MOV S [nnKT] *or* MOV SSW [nnKT] *or* MOV SW [nnKT] *or* MOV WSW [nnKT] *or* MOV W [nnKT] *or* MOV WNW [nnKT] *or* MOV NW [nnKT] *or* MOV NNW [nnKT]) *or* STNR		MOV SE MOV NNW MOV E 40KMH MOV E 20KT MOV WSW 20KT STNR	
Changes in intensity (C) [20]	Expected changes in intensity	INTSF or WKN *or* NC		INTSF WKN NC	
Forecast time (C) [20,21,26]	Indication of the forecast time of phenomenon	FCST AT nnnnZ	—	FCST AT 2200Z	—
TC forecast position (C)[24]	Forecast position of TC center	TC CENTER PSN Nnn[nn] *or* Snn[nn]	—	TC CENTER PSN N1030 E16015	—

		Wnnn[nn] *or* Ennn[nn] *or*[31] TC CENTER PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB		TC CENTER PSN N105 E15030CB	
Forecast position (C)[20, 21, 27, 33]	Forecast position of phenomenon at the end of the validity period of the SIGMET message[32]	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn] *or* N OF LINE[22] *or* NE OF LINE[22] *or* E OF LINE[22] *or* SE OF LINE[22] *or* S OF LINE[22] *or*	—	N30 W170 N OF N30 S OF S50 AND W OF E170 S OF N46 AND N OF N39 NE OF LINE N35 W020 – N45 W040 SW OF LINE N48 W020 – N43 E010 AND NE OF LINE N43 W020 – N38 E010 WI N20 W090 – N05 W090 – N10 W100 – N20 W100 – N20 W090 APRX 50KM WID LINE BTN N64 W017 – N57 W005 – N55 E010 – N55 E030 ENTIRE FIR ENTIRE UIR ENTIRE FIR/UIR ENTIRE CTA NO VA EXP WI 30KM OF N6030 E02550 † WI 150NM OF TC CENTER	—

		SW OF LINE[22] *or* W OF LINE[22] *or* NW OF LINE[22] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [AND N OF LINE[22] *or* NE OF LINE[22] *or* E OF LINE[22] *or* SE OF LINE[22] *or* S OF LINE[22] *or* SW OF LINE[22] *or* W OF LINE[22] *or* NW OF LINE[22] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]] *or* WI[21,22]Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]			

		Wnnn[nn] *or* Ennn[nn] *or* APRX nnKM WID LINE[22] BTN (nnNM WID LINE[22] BTN) Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* ENTIRE FIR *or* ENTIRE UIR *or* ENTIRE FIR/UIR *or* ENTIRE CTA *or*[28] NO VA EXP *or*[25] WI nnKM (*or* nnNM) OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn[nn] *or*[24] WI nnnKM (nnnNM) OF TC CENTER			
Repetition of elements (C)[29]	Repetition of elements included in a SIGMET message for volcanic ash cloud or tropical cyclone	[AND][29]	—	AND	—

OR					
Cancellation of SIGMET/ AIRMET (C)[30]	Cancellation of SIGMET/AIRMET referring to its identification	CNL SIGMET [n][n]n nnnnnn/nnnnnn *or*[28] CNL SIGMET [n][n]n nnnnnn/nnnnnn VA MOV TO nnnn FIR	CNL AIRMET [n][n]n nnnnnn/nnnnnn	CNL SIGMET 2 101200/101600 CNL SIGMET A13 251030/251430 VA MOV TO YUDO FIR[2]	CNL AIRMET 05 151520/151800

Notes.—

…

20. In the case of volcanic ash cloud covering more than one area within the FIR, these elements can be repeated, as necessary. Each location and forecast position is to be preceded by an observed or forecast time.

21. In the case of cumulonimbus clouds associated with a tropical cyclone covering more than one area within the FIR, these elements can be repeated as necessary. Each location and forecast position must be preceded by an observed or forecast time.

22. A straight line is to be used between two points drawn on a map in the Mercator projection or between two points which crosses lines of longitude at a constant angle.

23. The number of coordinates are to be kept to a minimum and should not normally exceed seven.

24. Only for SIGMET messages for tropical cyclones.

25. Only for SIGMET messages for radioactive cloud. When detailed information on the release is not available, a radius of up to 30 kilometers (or 16 nautical miles) from the source can be applied; and a vertical extent from surface (SFC) to the upper limit of the flight information region/upper flight information region (FIR/UIR) or control area (CTA) is to be applied. [Applicable from 7 November 2019 until 4 November 2020]

26. Only for SIGMET messages for radioactive cloud. A radius of up to 30 kilometers (or 16 nautical miles) from the source; and a vertical extent from surface (SFC) to the upper limit of the flight information region/upper flight information region (FIR/UIR) or control area (CTA) is to be applied. [Applicable 5 November 2020]

27. The elements "forecast time" and "forecast position" are not to be used in conjunction with the element "movement or expected movement".

28. The levels of the phenomena remain fixed throughout the forecast period.

29. Only for SIGMET messages for volcanic ash.

30. To be used for more than one volcanic ash clouds or cumulonimbus clouds associated with a tropical cyclone simultaneously affecting the FIR concerned.

31. End of the message (as the SIGMET/AIRMET message is being cancelled).

32. The term CB is to be used when the forecast position for the cumulonimbus cloud is included.

33. The forecast position for cumulonimbus (CB) cloud occurring in connection with tropical cyclones relate to the forecast time of the tropical cyclone center position, not to the end of the validity period of the SIGMET message.

34. For SIGMET messages for radioactive cloud, only within (WI) is to be used for the elements "location" and "forecast position".

35. For SIGMET messages for radioactive cloud, only stationary (STNR) is to be used for the element "movement or expected movement".

Table A3.6-1B. Template for special air-reports (uplink)

Key: M = inclusion mandatory, part of every message;

C = inclusion conditional, included whenever applicable;

= = a double line indicates that the text following it should be placed on the subsequent line.

Note.— The ranges and resolutions for the numerical elements included in special air-reports are shown in Table A6-4 of this appendix.

Element	*Detailed*	*Template [1,2]*	*Examples*
Identification (M)	Message identification	ARS	ARS
Aircraft Identification (M)	Aircraft radiotelephony call sign	nnnnnn	VA812[3]
Observed phenomenon (M)	Description of observed phenomenon causing the issuance of the special air-report[4]	TS TSGR SEV TURB SEV ICE SEV MTW HVY DS HVY SS VA CLD VA [MT nnnnnnnnnn] MOD TURB MOD ICE	TS TSGR SEV TURB SEV ICE SEV MTW HVY DS HVY SS VA CLD VA VA MT ASHVAL[5] MOD TURB MOD ICE
Observation time (M)	Time of observation of observed phenomenon	OBS AT nnnnZ	OBS AT 1210Z
Observed Location (C)	Location (referring to latitude and longitude (in degrees and minutes)) of observed phenomenon	NnnnnWnnnnn *or* NnnnnEnnnnn *or* SnnnnWnnnnn *or* SnnnnEnnnnn	N2020W07005 S4812E01036
Observed Level (C)	Flight level *or* altitude of	FLnnn *or*	FL390

	observed phenomenon	FLnnn/nnn *or* nnnnM (*or* [n]nnnnFT)	FL180/210 3000M 12000FT

Notes.—

1. No wind and temperature to be uplinked to other aircraft in flight in accordance with 3.2.

2. See 3.1.

3. Fictitious call sign.

4. In the case of special air-report for volcanic ash cloud, the vertical extent (if observed) and name of the volcano (if known) can be used.

5. Fictitious location.

…

Example A3.6-4. SIGMET message for radioactive cloud

YUCC SIGMET 2 VALID 201200/201600 YUDO –
YUCC AMSWELL FIR RDOACT CLD OBS AT 1155Z WI 30KM OF N6030 E02550 SFC/FL550 STNR

Meaning:

The second SIGMET message issued for the AMSWELL* flight information region (identified by YUCC Amswell area control center) by the Donlon/International* meteorological watch office (YUDO) since 0001 UTC; the message is valid from 1200 UTC to 1600 UTC on the 20th of the month; radioactive cloud was observed at 1155 UTC within 30 kilometers of 60 degrees 30 minutes north 25 degrees 50 minutes east between the surface and flight level 550. The radioactive cloud is stationary.

* Fictitious location

…

APPENDIX 3.8. TECHNICAL SPECIFICATIONS RELATED TO SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

(See CAR-ANS 3.9.)

…

2. SPECIFICATIONS RELATED TO INFORMATION FOR PRE-FLIGHT PLANNING AND IN-FLIGHT REPLANNING

…

2.2 Format of information on significant weather

2.2.1 Information on significant weather supplied by WAFCs for pre-flight planning 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.

2.2.2 As of 4 November 2021, in addition to 2.2.1, information on significant weather supplied by WAFCs for pre-flight planning and in-flight replanning shall be in IWXXM GML form.

Note 1.— The technical specifications for IWXXM are contained in the Manual on Codes *(WMO-No. 306), Volume I.3, Part D —* Representation Derived from Data Models. *Guidance on the implementation of IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (ICAO Doc 10003).*

Note 2. — Geography markup language (GML) is an encoding standard of the Open Geospatial Consortium (OGC).

…

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:

…

g) labels on the charts for flight documentation shall be clear and simple and shall present the name of the world area forecast center or, for non-world area forecast system (WAFS) products, the originating center, the type of chart, date and valid time and, if necessary, the types of units used in an unambiguous way.

Note.— When plotting shapes, particularly polygons, on maps, appropriate corrections are necessary if plotted on projections different to that used in the production of the original forecast area.

…

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

…

c) wind and temperature data selected from the data sets received from a world area forecast center shall be depicted in a sufficiently dense latitude/longitude grid; and

…

APPENDIX 3.9. TECHNICAL SPECIFICATIONS RELATED TO INFORMATION FOR AIR TRAFFIC SERVICES, SEARCH AND RESCUE SERVICES AND AERONAUTICAL INFORMATION SERVICES

(See CAR-ANS 3.10.)

…

1.3 List of information for the area control center and flight information center

The following meteorological information shall be supplied, as necessary, to an area control center or a flight information center by its associated meteorological watch office:

a) METAR and SPECI, including current pressure data for aerodromes and other locations, TAF and trend forecasts and amendments thereto, covering the flight information region or the control area and, if required by the flight information center or area control, center covering aerodromes in neighboring flight information regions, as determined by regional air navigation agreement;

b) forecasts of upper winds, upper-air temperatures and significant en-route weather phenomena and amendments thereto, particularly those which are likely to make operation under visual flight rules impracticable, SIGMET and AIRMET information and appropriate special air-reports for the flight information region or control area and, if determined by regional air navigation agreement and required by the flight information center or area control, center for neighboring flight information regions;

c) any other meteorological information required by the flight information center or area control center to meet requests from aircraft in flight; if the information requested is not available in the associated meteorological watch office, that office shall request the assistance of another meteorological office in supplying it;

…

1.4 Supply of information to aeronautical telecommunications stations

Where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to designated aeronautical telecommunication stations. A copy of such information shall be forwarded, if required, to the flight information center or the area control center.

…

2. INFORMATION TO BE PROVIDED FOR SEARCH AND RESCUE SERVICES UNITS

2.1 List of information

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

…

2.2 Information to be provided on request

2.2.1 On request from the rescue coordination, center the designated meteorological office shall arrange to obtain details of the flight documentation which was supplied to the missing aircraft, together with any amendments to the forecast which were transmitted to the aircraft in flight.

…

2.2.3 On request from the rescue coordination, center the designated meteorological office shall supply or arrange for the supply of meteorological information required by ships undertaking search and rescue operations.

…

3. INFORMATION TO BE PROVIDED FOR AERONAUTICAL INFORMATION SERVICES UNITS

3.1 List of information

The following information shall be supplied, as necessary, to an aeronautical information services unit:

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

Note.— Details of this information are given in the Manual of Standards for Aeronautical Information Services (MOS-AIS), Appendix 3, Part 1, GEN 3.5 and Part 3, AD 2.2, 2.11, 3.2 and 3.11.

…

APPENDIX 3.10. TECHNICAL SPECIFICATIONS RELATED TO REQUIREMENTS FOR AND USE OF COMMUNICATIONS

(See CAR-ANS 3.11.)

1. SPECIFIC REQUIREMENTS FOR COMMUNICATIONS

1.1 Required transit times of operational meteorological information

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

…

2.1.4 Transmission of bulletins containing operational meteorological information

Meteorological bulletins containing operational meteorological information shall be transmitted via the aeronautical fixed service (AFS).

…

ATTACHMENT 3.E. SPATIAL RANGES AND RESOLUTIONS FOR SPACE WEATHER ADVISORY INFORMATION
(RESERVED)

xxx

"End of Amendment"

i. ***Separability Clause.*** **-** If, for any reason, any provision of this Memorandum Circular is declared invalid or unconstitutional, the other part or parts thereof which are not affected thereby shall continue to be in full force and effect.

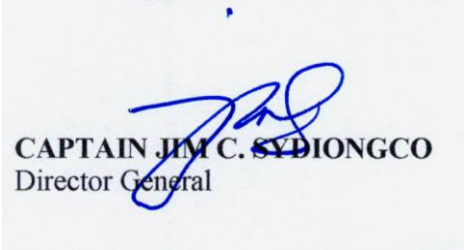
ii. ***Repealing Clause.*** **-** All orders, rules, regulations and issuances, or parts thereof which are inconsistent with this Memorandum Circular are hereby repealed, superseded or modified accordingly.

iii. ***Determination of changes.*** **–** To highlight the amendments and/or revisions in the Memorandum Circular, the deleted text shall be shown with strikethrough and the new inserted text shall be highlighted with grey shading, as illustrated below:

1. Text deleted: ~~Text to be deleted is shown with a line through it.~~
2. New text inserted: New text is highlighted with grey shading.
3. New text replacing existing text: ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.

iv. ***Effectivity Clause.*** **-** This Memorandum Circular shall take effect fifteen (15) days following completion of its publication in a newspaper of general circulation or the Official Gazette and a copy filed with the U.P. Law Center - Office of the National Administrative Register. The amendment shall be incorporated to Philippine CAR-ANS in the next regular Amendment Cycle.

So Ordered. Signed this 06 day of JANUARY 2021, at the Civil Aviation Authority of the Philippines, MIA Road, Pasay City, Metro Manila, 1301.



CAPTAIN JIM C. SYDIONGCO
Director General