

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC REGIONAL SIGMET GUIDE

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PART 1. INTRODUCTION

1.1 General

1.1.1 The main purpose of this document is to provide guidance for standardization and harmonization of the procedures and formats related to the aeronautical meteorological warnings for hazardous en-route meteorological phenomena, known as SIGMET information. The guidance is complementary to the Annex 3 standards and recommended practices regarding SIGMET and to the SIGMET related provisions of the ASIA/PAC Basic ANP and FASID, ICAO Doc 9673.

1.1.2 ICAO provisions concerning the issuance and dissemination of SIGMET information are contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapter 3, 3.4 – 3.7, Chapter 7, 7.1, and Part II, Appendix 6;
- ASIA/PAC Basic ANP, Part VI, and ASIA/PAC FASID Table MET 1B, MET 3A and MET 3B;
- Annex 11 - *Air Traffic Services*, Chapter 4, 4.2.1 and Chapter 7, 7.1;
- PANS – *Air Traffic Management*, Doc 4444, Chapter 9, 9.1.3.2;
- Regional Supplementary Procedures, Doc 7030, Part 1, 11.2.

Additional guidance on the SIGMET procedures is contained in the *Manual of Aeronautical Meteorological Practice* (Doc 8896), and the *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services* (Doc 9377).

1.1.3 The SIGMET Guide is intended mainly to assist the MWOs in the Asia/Pacific Region in preparing and disseminating SIGMET information. It provides detailed information on the format of SIGMET messages as specified by Annex 3. The explanations of the format are accompanied by examples based on region-specific meteorological phenomena. The guide also provides information regarding the necessary coordination between the MWOs, the ATS units and the pilots, and their respective responsibilities.

1.1.4 This document is prepared by the ICAO ASIA/PAC Regional Office. It is reviewed and updated regularly in order to be kept in line with the relevant ICAO SARPs and regional procedures. This current version incorporates the changes to SIGMET-related provisions included in Amendment 74 to Annex 3 which was approved by ICAO Council on 21 February 2007.

1.1.5 An amendment in December 2008 includes adding more complex SIGMET examples on Severe Turbulence, Tropical Cyclone and Volcanic Ash (APANPIRG/19 Conclusion 19/52) to Appendix G. Other changes include removing the outlook section from TC SIGMET examples (App. G), changing the period of validity of a WS SIGMET example from 6 to 4 hours (App. G), adding radioactive cloud to the list of SIGMET phenomenon (main document and App. E), providing the latest FASID MET tables (App. A, B and C), updating abbreviations in Appendix D in accordance to Doc 8400, removing note on limitations to New Zealand MWO coverage in Appendix H, adding Réunion WMO Tropical Cyclone Header to Appendix I, adding Réunion as participating TCAC unit in Appendix J, adding a clause that SIGMET tests should be terminated within 2 hours of the test start time to Appendix J, and updating Regional Office contact email address in Appendix J.

PART 2. RESPONSIBILITIES AND COORDINATION

2.1 General

2.1.1 SIGMET is warning information; hence it is of highest priority among other types of meteorological information provided to the aviation users. The primary purpose of SIGMET is for in-flight service, which requires timely transmission of the SIGMET messages to pilots by the ATS units and/or through VOLMET and D-VOLMET.

2.1.2 Airlines are the main users of the SIGMET information. They contribute to the effectiveness of the SIGMET service through issuance of special air-reports reported by pilots to the ATS units. Special air-reports are among the most valuable sources of information for the Meteorological Watch Offices (MWO) in the preparation of SIGMET. The ATS units receiving special air-reports should forward them to the associated MWOs without delay.

2.1.3 In view of the foregoing, it should be well understood that the effectiveness of the SIGMET service depends strongly on the level of collaboration between the MWOs, ATS units and pilots. That is why, close coordination between these parties, as well as mutual understanding of their needs and responsibilities are essential for the successful implementation of the SIGMET service.

2.1.4 For the special cases of SIGMET for volcanic ash and tropical cyclones, the MWOs are provided with advisories from the volcanic ash advisory centres (VAAC), and tropical cyclone advisory centres (TCAC) designated in the Regional ANP.

2.1.5 Another use of SIGMET is for the flight planning. This requires global dissemination of SIGMET through the international OPMET data banks and the satellite broadcasts: ISCS and SADIS. SIGMET should also be distributed to the World Area Forecast Centres (WAFC) London and Washington for use in the preparation of the significant weather (SIGWX) forecasts.

2.1.6 In the next paragraphs, the main responsibilities and coordination links, related to the provision of SIGMET information, are described.

2.2 Meteorological Watch Office - responsibilities and procedures related to SIGMET

2.2.1 SIGMET information should be issued by the meteorological watch offices (MWO) in order to provide timely warning for occurrence or expected occurrence of specified en-route weather phenomena, affecting the safety of the flight operations in the MWO's area of responsibility (AOR). SIGMET provides information concerning the location, extent, intensity and expected evolution of the specified phenomena.

2.2.2 Information about the provision of SIGMET service, including details on the designated MWO(s), should be included in the State's Aeronautical Information Publication (AIP) as specified in Annex 15, Aeronautical Information Service, Appendix 1, GEN 3.5.8.

2.2.3 All designated MWOs in ASIA/PAC Region are listed in the FASID Table MET 1B of the ASIA/PAC FASID, which is reproduced as Appendix A to this Guide.

2.2.4 If, for some reason, a State is not able to meet its obligations for establishing MWO(s) and for provision of SIGMET for the FIR(s) or control area(s) the State is providing air traffic services, arrangements should be made between the meteorological authorities of the States concerned, that another

MWO takes over these responsibilities for certain period of time. Such delegation of responsibilities should be notified by a NOTAM and a letter to the ICAO Regional Office.

2.2.5 Since the MWO is normally not a separate administrative unit, but part of the functions of an aerodrome meteorological office or other meteorological office, the meteorological authority concerned should ensure that the MWO obligations and responsibilities are clearly defined and assigned to the unit designated to serve as MWO. Corresponding operational procedures should be established and the meteorological staff should be trained accordingly.

2.2.6 In preparing SIGMET information MWOs should follow strictly the format determined in Annex 3 (detailed format description is provided in Appendix 6, Table A6-1 of Annex 3). SIGMET should be issued only for those weather phenomena listed in Annex 3 and only when specified criteria for their intensity and spatial extent are met.

Note: MWOs should not issue SIGMET for weather phenomena of lower intensity or such of transient nature or smaller scale, which does not affect significantly the flight safety and their transmission to users may lead to unnecessary precautionary measures.

2.2.7 The MWOs should be adequately equipped in order to be able to identify, analyze and forecast (to the extent required) those phenomena for which SIGMET is required. The MWO should make use of all available sources of information, such as special air-reports, information from meteorological satellites and weather radars.

2.2.8 On receipt of a special air-report from the associated ACC or FIC, the MWO should:

- a) issue SIGMET information based on the special-air report; or
- b) send the special air-report for on-ward transmission in case that the issuance of SIGMET information is not warranted (e.g., the phenomenon concerned is of transient nature).

2.2.9 Appropriate telecommunication means should be available at the MWO in order to ensure timely dissemination of SIGMET according to a dissemination scheme, which should include transmission to:

- Local ATS users;
- Aeronautical MET offices within its AOR, where SIGMET is required for briefing and/or flight documentation;
- Other MWOs concerned (it should be ensured that SIGMET is sent to all MWOs whose AORs are, at least partly, within the 1800 km (1000 NM) range from the observed phenomenon);
- Centres designated for transmission of VOLMET or D-VOLMET where SIGMET is required for those transmissions;
- Responsible ROBEX centre and Regional OPMET Data Bank (it should be arranged that through the ROBEX scheme SIGMETs are sent to the designated OPMET data banks in the other ICAO regions, to the WAFCS and to the SADIS and ISCS providers);

- Responsible TCAC or VAAC according to FASID Tables MET 3A and MET 3B.

2.2.10 In issuing SIGMET for tropical cyclones or volcanic ash, the MWOs should include as appropriate the advisory information received from the responsible TCAC or VAAC. In addition to the information received from the TCAC and VAAC the MWOs may use the available complementary information from other reliable sources. In such a case the responsibility for this additional information would lie completely on the MWO concerned.

2.3 Responsibilities of ATS units

2.3.1 Close coordination should be established between the MWO and the corresponding ATS unit (ACC or FIC) and arrangements should be in place to ensure:

- receipt without delay and display at the relevant ATS units of SIGMET issued by the associated MWO;
- receipt and display at the ATS unit of SIGMETs issued by MWOs responsible for the adjacent FIRs/ACCs if these SIGMETs are required according to p. 2.3.4 below, (within 1800 km (1000 NM) range from the observed phenomenon); and
- transmission without delay by the ATS unit of special air-reports received through voice communication to the associated MWO.

2.3.2 SIGMET information should be transmitted to aircraft with the least possible delay on the initiative of the responsible ATS unit, by the preferred method of direct transmission followed by acknowledgement or by a general call when the number of aircraft would render the preferred method impracticable.

2.3.3 SIGMET information transmitted to aircraft-in-flight should cover a portion of the route up to two hours flying time ahead of the aircraft. SIGMET should be transmitted only during the time corresponding to their period of validity (p. 3.4.2.4 refers).

2.3.4 Air traffic controllers should ascertain whether any of the currently valid SIGMETs may affect any of the aircraft they are controlling, either within or outside the FIR/CTA boundary, up to a distance of 1000 NM (1800 KM), which corresponds to two hours flying time ahead of the current position of the aircraft. If this is the case, the controllers should at their own initiative transmit the SIGMET promptly to the aircraft-in-flight likely to be affected. If necessary, the controller should pass to the aircraft available SIGMETs issued for the adjacent FIR/CTA, which the aircraft will be entering, if relevant to the expected flight route.

2.3.5 The ATS units concerned should also transmit to aircraft-in-flight the special air reports received, for which SIGMET has not been issued. Once a SIGMET for the weather phenomenon reported in the special air report is made available this obligation of the ATS unit expires.

2.4 Responsibilities of pilots

2.4.1 Timely issuance of SIGMET information is largely dependant on the prompt receipt by MWOs of special air-reports. That is why, it is essential that pilots prepare and transmit such reports to the ATS units whenever any of the specified en-route conditions are encountered or observed.

2.4.2 It should be emphasized that, even when automatic dependent surveillance (ADS) is being used for routine air-reports, pilots should continue to make special air-reports.

2.5 Coordination between MWOs and the TCACs and VAACs

2.5.1 Amongst the phenomena for which SIGMET information is required, the volcanic ash clouds and tropical cyclones are of particular importance for the planning of long-haul flights.

2.5.2 Since the identification, analysis and forecasting of volcanic ash and tropical cyclones requires considerable technical and human resource, normally not available at each MWO, the Volcanic Ash Advisory Centres (VAAC) and Tropical Cyclone Advisory Centres (TCAC) have been designated to provide VA and TC advisories to the users and assist the MWOs in the preparation of the forecast part of the SIGMETs for those phenomena. Close coordination should be established between the MWO and its responsible TCAC and/or VAAC.

2.5.3 Information regarding the VAACs and TCACs serving ASIA/PAC Region with their corresponding areas of responsibility and lists of MWOs and ACCs to which advisories are to be sent is provided in FASID Tables MET 3A and MET 3B of the ASIA/PAC FASID. These tables are reproduced in Appendix B and Appendix C to this Guide.

2.5.4 TC and VA advisories are required for global exchange through the satellite distribution systems, SADIS and ISCS. They are used by the operators during the preflight planning. Nevertheless, it should be emphasized that SIGMET information is still of higher operational status and is required especially for in-flight re-planning. SIGMETs should be transmitted to aircraft-in-flight through voice communication or VOLMET or D-VOLMET thus providing vital information for making in-flight decisions regarding large-scale route deviations due to volcanic ash clouds or tropical cyclones.

PART 3. PROCEDURES FOR PREPARATION OF SIGMET INFORMATION

3.1 General

3.1.1 SIGMET information is prepared in abbreviated plain language using approved ICAO abbreviations, a limited number of non-abbreviated words, geographical names and numerical values of self-explanatory nature. All abbreviations and words to be used in SIGMET are given in Appendix D.

3.1.2 The increasing use of automated systems for handling the MET information by the aviation users makes it essential that all types of OPMET information, including SIGMET, are prepared and transmitted in the prescribed standardized formats. Therefore, the structure and format of the SIGMET message, as specified in Annex 3, Part II, Appendix 6, which provides detailed information regarding the content and order of elements in the SIGMET message, should be followed strictly by the MWOs.

3.1.3 SIGMET is intended for transmission to aircraft in flight either by ATC or by VOLMET or D-VOLMET. Therefore, SIGMET messages should be kept concise and clear without additional descriptive text other than the prescribed in Annex 3.

3.1.4 After the issuance of a SIGMET the MWO should maintain watch over the evolution of the phenomenon for which the SIGMET has been issued and issue updated SIGMET when necessary. The TC and VA SIGMET should be updated at least every 6 hours.

3.1.5 SIGMET should be promptly cancelled when the phenomenon is no longer occurring or no longer expected to occur in the MWO's area of responsibility. The SIGMET is understood to cancel itself automatically at the end of its validity period. If the phenomenon persists a new SIGMET message for a further period of validity should be issued.

3.1.6 Some SIGMET are generated from special air-reports of weather phenomenon listed in section 3.2.1. The inclusion of the moderate category in the reporting of turbulence and icing used in special air-reports will commence with Amendment 75 to Annex 3 (Table A4-2 of Appendix 4 and Table A6-1 of Appendix 6). This has raised questions with regard to non-compliant reporting of two categories for the same event, and in particular, the response of the MWO. Though the categories for manual observations are defined in the ICAO Procedures for Air Navigation Services Air Traffic Management (PANS-ATM, Doc 4444, A1-4) for light, moderate, and severe turbulence, some pilots report turbulence as "moderate to severe". A MWO is then faced with determining which category to use in the special air-report and the possible issuance of SIGMET for severe.

3.1.7 In response to the non-compliant reporting, the Meteorological Warnings Study Group (METWSG) is expected to address the issue in November 2010 likely by considering guidance for pilots (report severe if in doubt). In the meantime, a local instruction on how to treat "moderate to severe" reports may be made. A State does not need to file a difference if the local instruction converts the non-compliant report in accordance to the defined categories.

3.1.8 The CNS/MET SG/14 meeting noted that a 'moderate to severe' AIREP is converted to severe by MWOs in some States in the Region to err on the side of safety. This practice was deemed acceptable by IATA representatives at the CNS/MET SG/14 meeting provided the occurrence of these non-compliant AIREPs does not occur frequently. Statistics for Hong Kong China indicated that 'moderate to severe' AIREPs constitute only a small portion of all AIREPs received. APANPIRG/21 discussed this issue further and determined that the ASIA/PAC Region should err on the side of safety and use severe for 'moderate to severe' AIREPs, which some States already practice. Therefore, though it

is the initiative of the State to determine how non-compliant AIREPs are treated, the APANPIRG/21 meeting encouraged States in the ASIA/PAC Region to use severe when 'moderate to severe' AIREPs are received.

3.2 Types of SIGMET

3.2.1 Although Annex 3 provides one general SIGMET format, which encompasses all weather phenomena, it is convenient when describing the structure and format of the messages to distinguish between three types of SIGMET, as follows:

- SIGMET for en-route weather phenomena other than VA and TC (this includes: TS, CB, TURB, ICE, MTW, DS, SS and RDOACT CLD); this SIGMET will be referred as WS SIGMET;
- SIGMET for volcanic ash, which will hereafter be denoted as VA SIGMET or WV SIGMET; and
- SIGMET for tropical cyclones, which will hereafter be denoted as TC SIGMET or WC SIGMET.

3.2.2 The three types of SIGMET can be identified by the data type designator included in the WMO abbreviated heading of the SIGMET message, as explained below.

3.3 Structure of the SIGMET message

3.3.1 A SIGMET message consists of:

- **WMO heading** – all SIGMETs are preceded by an appropriate WMO heading;
- **First line**, containing location indicators of the respective ATS unit and MWO, sequential number and period of validity;
- **SIGMET main body**, containing information concerning the observed or forecast weather phenomenon for which the SIGMET is issued together with its expected evolution within the period of validity;

3.3.2 The first two parts of the SIGMET message are common for all types of SIGMET. The format and content of the third part is different; that is why, in the following paragraphs the meteorological part of the SIGMET message is described separately for the three types of SIGMET.

3.4 Format of SIGMET

Note: In the following text, square brackets - [] - are used to indicate an optional or conditional element, and angled brackets - < > - for symbolic representation of a variable element, which in a real SIGMET accepts concrete numerical value.

3.4.1 WMO Header

T₁T₂A₁A₂ii CCCC YYGGgg [CCx]

3.4.1.1 The group **T₁T₂A₁A₂ii** is the bulletin identification for the SIGMET message. It is constructed in the following way:

T₁T₂	Data type designator	WS – for SIGMET for meteorological phenomena other than volcanic ash cloud or tropical cyclone WC – for SIGMET for tropical cyclone WV – for SIGMET for volcanic ash
A₁A₂	Country or territory designators	Assigned according to Table C1, Part II of Manual on the Global Telecommunication System, Vol I – Global Aspects (WMO - No. 386)
ii	Bulletin number	Assigned on national level according to p 2.3.2.2, Part II of Manual on the Global Telecommunication System, Vol I – Global Aspects (WMO - No. 386)

3.4.1.2 **CCCC** is the ICAO location indicator of the communication centre disseminating the message (could be the same as the MWO location indicator).

3.4.1.3 **YYGGgg** is the date/time group; where YY is the date and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).

3.4.1.4 The group **CCx** should be used only when issuing a correction to a SIGMET which had already been transmitted. The third letter “x” takes the value A for the first correction, B for the second correction, etc.

Examples:

WSTH31 VTBS 121200
WVJP31 RJTD 010230
WCNG21 AYPY 100600 CCA

3.4.2 First line of SIGMET

CCCC SIGMET [nn]n VALID YYGGgg/YYGGgg CCCC-

3.4.2.1 The meaning of the groups in the first line of the SIGMET is as follows:

CCCC	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers
SIGMET	Message identifier
[nn]n	Daily sequence number (see p.3.4.2.2)
VALID	Period of validity indicator
YYGGgg/YYGGgg	Validity period of the SIGMET given by date/time group of the beginning and date/time group of the end of the period (see p.3.4.2.3)
CCCC	ICAO location indicator of the issuing MWO
-	hyphen to separate the preamble from the text

3.4.2.2 The numbering of SIGMETs starts every day at 0001 UTC. The sequence number should consist of up to three symbols and may be a combination of letters and numbers, such as:

- 1, 2, ...
- 01, 02, ...
- A01, A02, ...

Examples:

**RPMM SIGMET 3 VALID 121100/121700 RPLL-
WSJC SIGMET A04 VALID 202230/210430 WSSS-**

Note 1: No other combinations should be used, like “CHARLIE 05” or “NR7”.

Note 2: Some States in the Region, like Australia, use more than 3 symbols, e.g., two letters and two figures. In the case of Australia this difference is due to the fact that more than one MWO serves one FIR and 4 characters are used to identify the part of the FIR for which the SIGMET is issued.

Note 3: Correct numbering of SIGMET is very important since the number is used for reference in communication between ATC and pilots and in VOLMET and D-VOLMET.

3.4.2.3 The following considerations should be taken into account when determining the validity period:

- The period of validity of a WS SIGMET should be not more than 4 hours;
- The period of validity of a WC or WV SIGMET should be up to 6 hours;
- In case of a SIGMET for an observed phenomenon, the filing time (date/time group in the WMO header) should be the same or very close to the time in the date/time group indicating the start of the SIGMET validity period;
- When the SIGMET is issued for a forecast phenomenon:
 - o the beginning of validity period should be the time of the expected commencement (occurrence) of the phenomenon in the MWO area of responsibility;
 - o the time of issuance of the SIGMET should be not more than 4 hours before the start of validity period (i.e., expected time of occurrence of the phenomenon); for TC and VA SIGMET the lead time should be up to 12 hours.

3.4.2.4 The period of validity is that period during which the SIGMET information is valid for transmission to aircraft in flight.

Examples:

1. SIGMET for an observed phenomenon:

**WSTH31 VTBS 241120
VTBB SIGMET 3 VALID 241120/241500 VTBS-**

2. SIGMET for a forecast phenomenon (expected time of occurrence 1530)

**WSSR20 WSSS 311130
WSJC SIGMET 1 VALID 311530/311930 WSSS-**

3.4.3 Format of the meteorological part of SIGMET messages for weather phenomena other than TC and VA

3.4.3.1 The meteorological part of a SIGMET for weather phenomena consists of seven elements as shown in the table below.

Start of the second line of the message

1	2	3	4	5
Name of the FIR/UIR or CTA	Description of the phenomenon	Observed or forecast	Location	Level
<CCCC> <name> FIR [CTA]	<Phenomenon>	OBS [AT <GGgg>Z] FCST [AT <GGgg>Z]	Geographical location of the phenomenon given by coordinates, or geographical objects, or location indicators	FL<nnn> or FL<nnn/nnn> or SFC/FL <nnn> or [TOP [ABV or BLW]] FL<nnn> <i>Note BLW used for CB only</i>

6	7
Movement or expected movement	Changes in intensity
MOV <direction, speed>KMH[KT] or STNR	INTSF or WKN or NC

3.4.3.1.1 Name of the FIR/UIR or CTA

CCCC <name> FIR[UIR]
or
CCCC <name> CTA

The ICAO location indicator and the name of the FIR/CTA are given followed by the appropriate abbreviation: FIR, FIR/UIR or CTA.

Examples:

VTBB BANGKOK FIR

3.4.3.1.2 Phenomenon

The phenomenon description consists of a qualifier and a phenomenon abbreviation. SIGMET should be issued only for the following phenomena observed or forecast at cruising levels (irrespective of altitude):

- thunderstorms – if they are OBSC, EMBD, FRQ or SQL with or without hail;
- turbulence – only SEV
- icing – only SEV with or without FZRA
- mountain waves – only SEV
- dust storm – only HVY
- sand storm – only HVY
- radioactive cloud – RDOACT CLD

The appropriate abbreviations and combinations, and their meaning are given in Appendix E.

3.4.3.1.3 Indication whether the phenomenon is observed or forecast

**OBS [AT <GGgg>Z]
or FCST [AT <GGgg>Z]**

The indication whether the phenomenon is observed or forecast is given by using the abbreviations OBS or FCST. OBS and FCST are followed by an optional time group in the form AT GGggZ, where GGgg is the time of the observation in hours and minutes UTC. If the exact time of the observation is not known the time is not included. When FCST is used, the time listed represents the time of commencement of the phenomenon.

Examples:

**OBS AT 0140Z
FCST AT 0200Z**

3.4.3.1.4 Location of the phenomenon

The location of the phenomenon is given with reference to geographical coordinates (latitude and longitude) or with reference to geographical features well known internationally. The MWOs should try to be as specific as possible in reporting the location of the phenomenon and, at the same time, to avoid overwhelming geographical information, which may be difficult to process or perceive.

The following are the most common ways to describe the location of the phenomenon:

- Indication of a part of the FIR with reference to latitude:
N OF or S OF <Nnn[nn]> or <Snn[nn]>
- Indication of a part of the FIR with reference to longitude:
E OF or W OF <Ennn[nn]> or <Wnnn[nn]>
- Indication of a part of the FIR with reference to latitude and longitude:
any combination of the above two cases;
- Location with reference to a **LINE** described with lat/lon of two points;
- With reference to a location with ICAO location abbreviation CCCC (normally, this should be the case of SIGMET based on special air-report in which the reported phenomenon is given with reference to an airport or another object with ICAO location indicator CCCC);
- With reference to geographical features well known internationally.

More details on reporting the location of the phenomenon are given in Appendix 6 to Annex 3 and in Appendix F to this Guide.

3.4.3.1.5 Flight level and extent

**FL<nnn>
or FL<nnn/nnn>
or SFC/FL<nnn>
or TOP FL<nnn>
or [TOP] ABV FL<nnn>**

or [TOP] BLW FL<nnn>
note BLW used for CB only

The location or extent of the phenomenon in the vertical is given by one or more of the above abbreviations, as follows:

- reporting single level – **FL<nnn>**
- reporting a layer – **FL<nnn/nnn>**, where the lower level is reported first; this is used particularly in reporting turbulence and icing
- reporting from surface to a flight level – **SFC/FL<nnn>**
- reporting a level or layer with reference to one FL using ABV or BLW
- reporting the level of the tops of the TS clouds using the abbreviation TOP

Examples:

EMBD TS ... TOP ABV FL340
SEV TURB ... FL180/210
SEV ICE ... SFC/FL150
SEV MTW ... FL090

3.4.3.1.6 Movement

MOV <direction> <speed>KMH[KT]
 or
STNR

Direction of movement is given with reference to one of the sixteen points of compass. Speed is given in KMH or KT. The abbreviation STNR is used if no significant movement is expected.

Examples:

MOV NNW 30KMH
MOV E 25KT

3.4.3.1.7 Expected changes in intensity

The expected evolution of the phenomenon's intensity is indicated by one of the following abbreviations:

INTSF – intensifying
WKN – weakening
NC – no change

3.4.4 Structure of the meteorological part of VA SIGMET

3.4.4.1 The general structure of the meteorological part of the SIGMET message is given in the table below:

Start of the second line of the message

1	2		3	
FIR/UIR or CTA	Phenomenon	Volcano		Volcanic ash cloud observed or forecast
		Name	Position	
<CCCC> <name> FIR [UIR][CTA]	VA	[ERUPTION] [MT <name>]	[PSN <lat,lon>]	VA CLD OBS AT <GGgg>Z VA CLD FCST AT <GGgg>Z

4			5
Extent of the cloud			Expected movement
Vertical	Horizontal	Position	
FL <nnn/nnn>	[APRX <nnn> KM[NM] BY <nnn> KM[NM]]	[<lat,lon> - <lat,lon> - ...]	MOV <direction> <speed>

6	
Volcanic ash cloud forecast at the end of the period of validity	
FCST time	Position
FCST <GGgg>Z	VA CLD APRX <lat,lon> - <lat,lon> - ...

3.4.4.2 Name and location of the volcano and/or indicator for VA cloud

VA [ERUPTION] [MT <name>] [PSN<lat,lon>] VA CLD
or
VA CLD

3.4.4.2.1 The description of the volcano injecting volcanic ash consists of the following elements:

- starts with the abbreviation **VA** – volcanic ash;
- the word **ERUPTION** is used when the SIGMET is issued for a known volcanic eruption;
- geographical/location information:
 - i. if the name of the volcano is known, it is given by the abbreviation **MT** – mountain, followed by the name;
e.g., **MT RABAU**
 - ii. location of the volcano is given by the abbreviation **PSN** – position, followed by the latitude and longitude in degrees and minutes;
e.g., **PSN N3520 E09040**
- this section of the message ends with the abbreviation **VA CLD** – volcanic ash cloud.

3.4.4.2.2 If the FIR is affected by a VA cloud with no information about the volcanic eruption which generated the cloud, only the abbreviation **VA CLD** should be included in the SIGMET.

3.4.4.3 Time of observation or forecast

VA CLD OBS AT <GGgg>Z
 or
VA CLD FCST AT <GGgg>Z

The time of observation is taken from the source of the observation – satellite image, special air-report, report from a volcanological station, etc. If the VA cloud is not yet observed over the FIR but the volcanic ash advisory received from the responsible VAAC indicates that the cloud is going to affect the FIR within the next 12 hrs, SIGMET should be issued according to paragraph 2.4 above and the abbreviation VA CLD FCST AT <GGgg>Z should be used.

Examples:

VA CLD OBS AT 0100Z
VA CLD FCST AT 1200Z

3.4.4.4 Level and extent of the volcanic ash cloud

FL<nnn/nnn> [APRX <nnn>KM BY <nnn>KM] [<P1(lat,lon) - P2(lat,lon) - ... >]
 or
FL<nnn/nnn> [APRX <nnn>NM BY <nnn>NM] [<P1(lat,lon) - P2(lat,lon) - ... >]

FL<nnn/nnn>	The layer of the atmosphere where the VA cloud is situated, given by two flight levels from the lower to the upper boundary of the cloud
[APRX <nnn>KM BY <nnn>KM] or [APRX <nnn>NM BY <nnn>NM] or [nnKM WID LINE BTN (nnNM WID LINE BTN)]	Approximate horizontal extent of the VA cloud in KM or NM; or along line with defined width (WID)
[<P1(lat,lon) – P2(lat,lon) - ... >]	Approximate description of the VA cloud by a number of points given with their geographical coordinates ¹ ; the points should be separated by hyphen

If the VA cloud spreads over more than one FIR, separate SIGMETs should be issued by all MWOs whose FIRs are affected. In such a case, the description of the volcanic ash cloud by each MWO should encompass the part of the cloud, which lies over the MWO's area of responsibility. The MWOs should try and keep the description of the volcanic ash clouds consistent by checking the SIGMET messages received from the neighboring MWOs.

Examples:

FL100/180 APRX 10KM BY 50KM N0100 E09530 – N1215 E11045
FL 150/210 S0530 E09300 – N0100 E09530 – N1215 E11045

3.4.4.5 Movement or expected movement of the VA cloud

MOV <direction> <speed>KMH[KT]
 or
STNR

¹ The format of geographical coordinates reporting in SIGMET is given in Appendix F.

The direction of movement is given by the abbreviation **MOV** – moving, followed by one of the sixteen points of compass: N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, and NNW. The speed of movement is given in KMH or KT.

Examples:

MOV E 35KMH
MOV SSW 20KT
STNR

3.4.4.6 Forecast position of the VA cloud at the end of the validity period of the SIGMET message

FCST <GGgg>Z VA CLD APRX <P1(lat,lon) - P2(lat,lon) - ... >

The **GGggZ** group should indicate the end of validity period given in the first line of the SIGMET message. The description of the expected position of the volcanic ash cloud is given by a number of points forming a simplified geometrical approximation of the cloud.

3.4.4.7 When the wind direction distribution with height determines that the cloud is spread horizontally into different directions at different height layers the VA cloud may need to be described by more than one layer; the different layers should be indicated by flight levels in the form FL<nnn/nnn>.

3.4.5 Structure of the meteorological part of TC SIGMET

3.4.5.1 The general structure of the meteorological part of the TC SIGMET is given in the table below:

Start of the second line of the message

1	2	3		4
FIR/UIR or CTA	TC name	Observed or forecast		Extent
		Time	Location of TC centre	
<CCCC> <name> FIR [/UIR][CTA]	TC <name>	OBS AT <GGgg>Z [FCST] AT <GGgg>Z	<lat,lon>	CB TOP [ABV or BLW] FL<nnn> WI <nnn>KM[NM] OF CENTRE

5	6	7
Expected movement	Intensity change	Forecast of the centre position at the end of the validity period
MOV <direction> <speed>KMH[KT] or STNR	INTSF or WKN or NC	FCST <GGgg>Z TC CENTRE <lat,lon>

3.4.5.2 Name of the tropical cyclone

TC <name>

The description of the tropical cyclone consists of the abbreviation TC followed by the international name of the tropical cyclone given by the corresponding WMO RSMC. If disturbance is expected to become a TC, but is not named at the time the forecast is issued, NN is used for the TC name. The reference NN replaces NIL in Amendment 75 to Annex 3 to avoid confusion by the users.

Examples:

TC GLORIA
TC 04B
TC NN

3.4.5.3 Time of observation or forecast

OBS AT <GGgg>Z
or
FCST AT <GGgg>Z

The time in UTC is given in hours and minutes, followed by the indicator Z. Normally, time is taken from own observations or from a TC advisory received from the responsible TCAC. If the TC is not yet observed in the FIR but the tropical cyclone advisory received from the responsible TCAC, or any other TC forecast used by the MWO, indicates that the TC is going to affect the FIR within the next 12 hrs, SIGMET should be issued, according to paragraph 2.4 above, and the abbreviation FCST AT <GGgg>Z should be used.

Examples:

OBS AT 2330Z
FCST AT 0900Z

3.4.5.4 Location of the TC centre

<location>

The location of the TC centre is given by its lat, lon coordinates in degrees and minutes.

Examples:

N1535 E14230

3.4.5.5 Vertical and horizontal extent of the CB cloud formation around TC centre

CB TOP [ABV or BLW] <FLnnn> WI <nnnKM or nnnNM> OF CENTRE

Examples:

CB TOP ABV FL450 WI 200NM OF CENTRE
CB TOP FL500 WI 250KM OF CENTRE

3.4.5.6 Movement or expected movement

**MOV <direction> <speed>KMH[KT]
or
STNR**

Direction of movement is given with reference to one of the sixteen points of compass. Speed is given in KMH or KT. The abbreviation STNR is used if no significant movement is expected.

Examples:

**MOV NNW 30KMH
MOV E 25KT**

3.4.5.7 Intensity change

The expected change of the intensity of the tropical cyclone is indicated by one of the following abbreviations:

**INTSF – intensifying
WKN – weakening
NC – no change**

3.4.5.8 Forecast location of the TC centre at the end of the validity period of the SIGMET message

FCST <GGgg>Z TC CENTRE <location>

Normally, the time given by GGggZ should be the same as the end of validity period indicated in the first line of the SIGMET message. Since the period of validity is up to 6 hours (normally, 6 hours), this is a 6-hour forecast of the position of the TC centre.

The location of the TC centre is given by its lat, lon coordinates following the general rules of reporting lat, lon information provided in Appendix F to this Guide.

Examples:

FCST 1200Z TC CENTRE N1430 E12800

3.4.6 Cancellation of SIGMET

3.4.6.1 If during the validity period of a SIGMET the phenomenon for which the SIGMET had been issued is no longer occurring or no longer expected, the SIGMET should be cancelled by the issuing MWO. The cancellation is done by issuing same type of SIGMET with the following structure:

- WMO heading with the same data type designator;
- First line that contains as period of validity the remaining time of the original period of validity;

- Second line, which contains the name of the FIR or CTA, the combination CNL SIGMET, followed by the sequential number of the original SIGMET and its validity period.

Examples:

1. Cancellation of a WS or WC SIGMET:

**WSXY31 YUSO 101200
YUDD SIGMET 5 VALID 101200/101600 YUSO-
YUDD SHANLON FIR ...**

Cancellation SIGMET:

**WSXY31 YUSO 101430
YUDD SIGMET 6 VALID 101430/101600 YUSO-
YUDD SHANLON FIR CNL SIGMET 5 101200/101600=**

2. Cancellation of a VA SIGMET

**WVXY31 YUSO 131518
YUDD SIGMET 03 VALID 131515/132115 YUSO-
YUDD SHANLON FIR ...**

Cancellation SIGMET:

**WVXY31 YUSO 132000
YUDD SIGMET 04 VALID 132000/132115 YUSO-
YUDD SHANLON FIR CNL SIGMET 03 13151500/132115=**

or, in case that the volcanic ash cloud moves to an adjacent FIR:

**WVXY31 YUSO 132000
YUDD SIGMET 04 VALID 132000/132115 YUSO-
YUDD SHANLON FIR CNL SIGMET 03 13151500/132115 VA MOV TO YUDO
FIR=**

3.5 Dissemination

3.5.1 SIGMET information is part of the operational meteorological (OPMET) information. According to Annex 3 the telecommunication facilities used for the exchange of the operational meteorological information should be the aeronautical fixed service (AFS).

3.5.2 The AFS consists of a terrestrial segment, AFTN or ATN (AMHS), and a satellite segment which comprises the SADIS and ISCS satellite broadcasts provided by the UK and the USA respectively. Note that SIGMET priority indicator is **FF** for flight safety messages (Annex 10 Vol. II, 4.4.1.1.3).

3.5.3 Currently, AFTN links should be used by the MWOs to send the SIGMET, as follows:

- to the adjacent MWOs and ACCs* using direct AFTN addressing;
- When required for VOLMET or D-VOLMET, SIGMET should be sent to the relevant centre providing the VOLMET service;
- SIGMET should be sent to all regional OPMET Data Banks (RODB);
- It should be arranged that SIGMET is relayed to the SADIS and ISCS providers for satellite dissemination, as well as to the WAFCS London and Washington, either through the ROBEX scheme, or directly by the issuing MWO;
- SIGMET for volcanic ash should be disseminated to the responsible VAAC.

3.5.4 Through SADIS and ISCS, SIGMET is disseminated to all authorised users. In this way, SIGMET is available on a global basis, meeting the aeronautical requirements.

** Note: For this dissemination it is required that SIGMET is available at the ACCs for transmission to aircraft in flight for the route ahead up to a distance corresponding to two hours flying time.*

Note: To avoid duplicate advisories being counted in the TC and VA SIGMET test analysis, only FK and FV messages received by AFTN (not GTS and WAFS) are counted in the analysis.

APPENDIX A**FASID Table MET 1B****METEOROLOGICAL WATCH OFFICES**

EXPLANATION OF THE TABLE

Column

1. Location of the meteorological watch office (MWO). Locations, other than aerodromes, where an MWO is to be established are shown in parentheses.
2. ICAO location indicator, assigned to the MWO.
3. Name of the FIR, UIR and/or search and rescue region (SRR) served by the MWO.
4. ICAO location indicator assigned to the ATS unit serving the FIR, UIR and/or SRR.
5. Remarks.

Note (1). — Unless otherwise stated in column 5, the MWO listed in column 1 is the designated collecting centre for the air-reports received within the corresponding FIR/UIR listed in column 3.

Note (2). — Non-implementation of a required MWO is a serious deficiency.

MWO Location	ICAO loc. ind.	Area served		Remarks	
		Name	ICAO loc. ind.		
1	2	3	4	5	
AFGHANISTAN					
KABUL AD	OAKB	Kabul FIR and SSR	OAKX		
AUSTRALIA					
ADELAIDE (REGIONAL FORECASTING CENTRE)	YPRM	Melbourne FIR ¹⁾	YMMM	MWOs have areas of responsibility (AOR) defined by specific forecast area boundaries. These boundaries are not aligned with FIR boundaries MWO Darwin is designated to issue VA SIGMET for the whole Brisbane and Melbourne FIR	
BRISBANE (REGIONAL FORECASTING CENTRE)	YBRF	Brisbane FIR ²⁾	YBBB		
CAIRNS	YBCS	Brisbane FIR ¹³⁾	YBBB		
DARWIN (REGIONAL FORECASTING CENTRE)	YPDM	Brisbane FIR ⁴⁾ Melbourne FIR ⁵⁾	YBBB YMMM		
HOBART (REGIONAL FORECASTING CENTRE)	YMHF	Melbourne FIR ⁶⁾	YMMM		
MELBOURNE (WORLD MET CENTRE, BUREAU OF METEOROLOGY)	YMMC	Brisbane FIR Melbourne FIR	YBBB YMMM		
MELBOURNE (REGIONAL FORECASTING CENTRE)	YMRF	Brisbane FIR ⁷⁾ Melbourne FIR ⁸⁾	YBBB YMMM		
PERTH (REGIONAL FORECASTING CENTRE)	YPRF	Brisbane FIR ⁹⁾ Melbourne FIR ¹⁰⁾	YBBB YMMM		
SYDNEY (REGIONAL FORECASTING CENTRE)	YSRF	Brisbane FIR ¹¹⁾ Melbourne FIR ¹²⁾	YBBB YMMM		
BANGLADESH					
HAZRAT SHAHJALAL INTERNATIONAL AIRPORT ZIA INTL AIRPORT, DHAKA	VGHS VGZR	Dhaka FIR and SRR	VGFR		
CAMBODIA					
PHNOM PENH	VDPP	Phnom Penh FIR and SRR	VDPP	MWO not implemented, however, arrangement made for issuance of SIGMET by Chengdu MWO	
CHINA					
BEIJING/Capital	ZBAA	Beijing FIR and SRR	ZBPE		
GUANGZHOU/Baiyun	ZGGG	Guangzhou FIR and SRR	ZGZU		
CHENGDU/Shuangliu	ZUUU	Kunming FIR and SRR	ZPKM		
XI'AN/Xianyang	ZLXY	Lanzhou FIR and SRR	ZLHW		
HAIKOU/Meilan	ZJHK	Sanya FIR and SRR	ZJSA		
SHANGHAI/Hongqiao	ZSSS	Shanghai FIR and SRR	ZSHA		
SHENYANG/Taoxian	ZYTX	Shenyang FIR and SRR	ZYSH		
TAIBEI CITY/Taipei Intl AP	RCTP	Taipei FIR and SRR	RCAA*		
URUMQI/Diwopu	ZWWW	Urumqi FIR and SRR	ZWUQ		
WUHAN/Tianhe	ZHHH	Wuhan FIR and SRR	ZHWH		
HONG KONG/International	VHHH	Hong Kong FIR and SRR	VHHK		
DEMOCRATIC PEOPLE'S					

MWO Location	ICAO loc. ind.	Area served		Remarks
		Name	ICAO loc. ind.	
1	2	3	4	5
REPUBLIC OF KOREA				
SUNAN	ZKPY	Pyongyang FIR and SRR	ZKKP	
FIJI				
NADI/Intl	NFFN	Nadi FIR and SRR	NFFF	
FRENCH POLYNESIA				
TAHITI/Faaa	NTAA	Tahiti FIR and SRR	NTTT*	
INDIA				
CHENNAI	VOMM	Chennai FIR and SRR	VOMF	
DELHI/Indira Ghandi Intl	VIDP	Delhi FIR and SRR	VIDF	
KOLKATA/Kolkata	VECC	Kolkata FIR and SRR	VECF	
MUMBAI/Chhatrapati Shivaji Intl.	VABB	Mumbai FIR and SRR	VABF	
INDONESIA				
JAKARTA/Soekarno-Hatta (Comm Center)	WIII	Jakarta FIR/UIR and SRR	WIIF	
UJUNG PANDANG/Hasanuddin (Comm Center)	WAAA	Ujung Pandang FIR/UIR and SRR	WAAF	
JAPAN				
TOKYO (CITY)	RJTD	Fukuoka FIR and Tokyo SRR	RJJJ	
LAO PEOPLE'S DEMOCRATIC REPUBLIC				
VIENTIANE/Wattay	VLVT	Vientiane FIR and SRR	VLVT	MWO not implemented
MALAYSIA				
SEPANG/KL International Airport	WMKK	Kota Kinabalu FIR and SRR Kuala Lumpur FIR and SRR	WBFC WMFC	
MALDIVES				
MALE/Intl	VRMM	Male FIR and SRR	VRMF	
MONGOLIA				
ULAANBAATAR	ZMUB	Ulaanbaatar FIR and SRR	ZMUB	
MYANMAR				
YANGON INTERNATIONAL	VYYY	Yangon FIR and SRR	VYYY	
NAURU				
NAURU I.	ANYN	Nauru FIR and SRR	ANAU	MWO not implemented, however, arrangement made for issuance of SIGMET by Port Moresby MWO
NEPAL				
KATHMANDU	VNKT	Kathmandu FIR and SRR	VNSM	
NEW ZEALAND				
WELLINGTON (AVIATION WEATHER CENTRE)	NZKL	Auckland Oceanic FIR and SRR New Zealand FIR AND SRR	NZZO NZZC	
PAKISTAN				
KARACHI/Jinnah Int'l	OPKC	Karachi FIR and SRR	OPKR	
LAHORE/Allama Iqbal Int'l	OPLA	Lahore FIR and SRR	OPLR	

MWO Location	ICAO loc. ind.	Area served		Remarks
		Name	ICAO loc. ind.	
1	2	3	4	5
PAPUA NEW GUINEA				
PORT MORESBY INTL	AYPY	Port Moresby FIR and SRR	AYPY	
PHILIPPINES				
MANILA/Ninoy Aquino Intl, Pasay City, Metro Manila	RPLL	Manila FIR and SRR	RPHI	
REPUBLIC OF KOREA				
INCHEON	RKSI	Incheon FIR and SRR	RKRR	
SINGAPORE				
SINGAPORE/Changi	WSSS	Singapore FIR and SRR	WSJC	
SOLOMON ISLANDS				
HONIARA (HENDERSON)	AGGH	Honiara FIR and SRR	AGGG	MWO not implemented, however, arrangement made for issuance of SIGMET by Port Moresby MWO
SRI LANKA				
BANDARANAIKE INTERNATIONAL AIRPORT COLOMBO	VCBI	Colombo FIR and SRR	VCBI	
THAILAND				
BANGKOK/Suvarnabhumi Intl Airport	VTBS	Bangkok FIR and SRR	VTBB	
UNITED STATES				
ANCHORAGE	PAWU	Anchorage FIR	PAZA	
HONOLULU	PHFO	Oakland Oceanic and Honolulu SRR.	KZAK	FIR South of 30N, East of 130E and West of 140W, Honolulu SRR
KANSAS CITY	KKCI	Oakland Oceanic FIR	KZAK	North of 30N of Oakland Oceanic FIR (excluding KZOA) South of 30N between 120W and 140W
VIET NAM				
GIA LAM	VVGL	Hanoi FIR and SRR Ho-Chi-Minh FIR and SRR	VVNB VVTS	

- 1) limited by the coordinates: 27S/128E;27S/135E;26S/138E; 2806S/14012E;29S/142E; 3414S/14205E;3345S/14045E; 40S/14045E;45S/14045E; 45S/129E;33S/129E;30S/129E; 2715S/12830E.
- 2) outside the AOR of YBTL MWO and limited by the coordinates: 0937S/14102E;0916S/14203E; 0913S/14206E;0911S/14214E; 0914S/14217E;0922S/14230E; 0922S/14230E;0923S/14236E; 0919S/14248E;0908S/14352E; 0924S/14414E;0957S/14405E; 1130S/14402E;1144S/14404E; 12S/144E;12S/155E;14S/155E; 14S/16115E;1740S/163E; 2830S/163E;2830S/155E; 2850S/15316E;29S/150E; 29S/14330E;26S/138E; 14S/138E;0937S/14102E.
- 3) limited by the coordinates: 26S/138E;29S/143E;29S/142E; 2806S/14012E;26S/138E.
- 4) limited by the coordinates: 1055S/12447E;0920S/12650E; 07S/135E;0950S/13940E; 0950S/141E;14S/138E; 18S/138E;2215S/138E; 26S/138E;2218S/13638E; 2128S/13609E;2111S/13134E; 2151S/13058E;2313S/12828E; 2322S/12629E;2327S/12415E; 2250S/12330E;2030S/12330E; 20S/129E;16S/12915E; 1528S/12806E;1450S/12825E; 14S/12730E;1345S/12609E; 14S/124E;1055S/12447E.
- 5) limited by the coordinates: 2250S/12330E;2327S/12415E; 2322S/12629E;2313S/12828E; 2151S/13058E;2111S/13134E; 2128S/13609E;2218S/13638E; 26S/138E;27S/135E; 2715S/12830E;25S/12815E; 25S/12330E;2250S/12330E.
- 6) limited by the coordinates: 40S/14045E;40S/143E; 3953S/14353E;4006S/14759E; 40S/150E;45S/150E; 45S/14045E;40S/14045E.
- 7) limited by the coordinates: 3730S/15033E;3730S/163E; 45S/163E;45S/150E; 4434S/150E;4351S/15040E; 43S/151E;3811S/15019E; 3730S/15033E.

- 8) limited by the coordinates: 3345S/14045E;3414S/14205E; 3510S/14728E;3730S/150E; 3730S/15033E;3811S/15019E; 43S/151E;4351S/15040E; 4434S/150E;40S/150E; 4006S/14759E;3953S/14353E; 40S/143E;40S/14045E; 3811S/14045E;3345S/14045E.
 - 9) limited by the coordinates: 2311S/12831E; 2313S/12827E; 2321S/12631E; 2326S/12414E; 2133S/12226E; 2015S/12113E; 1858S/1203E; 1752S/11821E; 148S/1158E; 12S/11430E; 12S/12319E; 12S/12320E; 1055S/12446E; 140S/1240E; 1345S/1268E; 140S/12730E; 1449S/12825E; 1528S/1286E; 16S/12915E; 20S/1290E;
 - 10) limited by the coordinates: 12S/11430E; 148S/1158E; 1752S/11821E; 1858S/1203E; 2015S/12113E; 2133S/12226E; 2326S/12414E; 2321S/12631E; 2313S/12827E; 2311S/12831E; 25S/12815E; 2715S/12830E; 30S/1290E; 50S/1290E; 50S/75E; 60S/75E; 20S/78E; 20S/92E; 12S/107E;
 - 11) limited by the coordinates: 29S/14632E;29S/150E; 2850S/15328E;2830S/155E; 2830S/163E;3730S/163E; 3730S/15033E 3657S/15045E; then east of the minor arc of a circle of 120NM radius centred on 3457S/15032E; 3519S/15256E;3421S/15140E; 3359S/15201E;3351S/15154E; 3328S/15148E;3315S/15126E; 3312S/15114E;3320S/15042E; 3327S/15033E;3206S/14850E; 29S/14632E.
 - 12) limited by the coordinates: 29S/142E;29S/14330E; 29S/14632E;3206S/14850E; 3327S/15033E;3320S/15042E; 3312S/15114E;3315S/15126E; 3328S/15148E;3351S/15154E; 3359S/15201E;3421S/15140E; 3519S/15256E; then east of the minor arc of a circle of 120NM radius centred on 3457S 15032E; 3657S/15045E;3730S/15033E; 3730S/150;3510S/14728E; 3414S/14205E;29S/142E.
 - 13) limited by the coordinates: 14S/138E;10S/141E;09S/142E; 09S/144E;13S/145E;15S/147E; 1817S/148E;2309S/15252E; 2334S/14811E;1818S/14332E; 18S/138E;14S/138E.
-

APPENDIX B

FASID Table MET 3A

TROPICAL CYCLONE ADVISORY CENTRES

EXPLANATION OF THE TABLE

Column

1. Location of the tropical cyclon advisory centre (TCAC).
2. ICAO location indicator of TCAC (for use in the WMO heading of advisory bulletin).
3. Area of responsibility for the preparation of advisory information on tropical cyclones by the TCAC in column 1.
4. Period of operation of the TCAC.
5. MWOs to which the advisory information on tropical cyclones should be sent.
6. ICAO location indicator of the MWOs in Column 5.

Note. - MWOs in italics are situated outside the Asia/Pacific Region.

TROPICAL CYCLONE ADVISORY CENTRE	ICAO LOC. IND.	AREA OF RESPONSIBILITY	PERIOD OF OPERATION ²⁾	MWO TO WHICH ADVISORY INFORMATION IS TO BE SENT	
				Name	ICAO LOC. IND.
1	2	3	4	5	6
Darwin (Australia)	YPDM	South-East Indian Ocean N: 0°S S: 36°S W: 90°E E: 141°E South-West Pacific Ocean N: 0°S S: 40°S W: 141°E E: 160°E	November – April	Adelaide ³⁾ Brisbane Colombo Darwin Hobart ³⁾ Honiara ⁴⁾ Jakarta Melbourne ³⁾ Perth Port Moresby Sydney ³⁾ Cairns ³⁾ Ujung Pandang Melbourne (World Met Centre, BoM) ³⁾	YPRM YBRF VOMM YDRM YMHF AGGH WIII YMRF YPRF AYPY YSRF YBCS WAAA YMMC
Honolulu (United States)	PHFO	Central Pacific: N: 60°N S: 0°N W: 180°W E: 140°W	May – November	<i>Anchorage</i> Honolulu <i>Kansas City</i> Tahiti	<i>PAWU</i> PHFO <i>KKCI</i> NTAA
Miami (United States)	KNHC	Eastern Pacific: N: 60°N S: 0°N W: 140°W E: Coastline	May – November	Honolulu <i>Kansas City</i> Tahiti	PHFO <i>KKCI</i> NTAA
Nadi (Fiji)	NFFN	Southern Pacific: N: 0°S S: 40°S W: 160°E E: 120°W	November – April	Brisbane Cairns ³⁾ Hobart ³⁾ Honiara ⁴⁾ Honolulu Melbourne ³⁾ Melbourne (World Met Centre, BoM) ³⁾ Nadi Nauru ⁴⁾ Sydney ³⁾ Tahiti Wellington (Aviation Weather Centre)	YBRF YBCS YMHF AGGH PHFO YMRF YMMC NFFN ANYN YSRF NTAA NZKL

TROPICAL CYCLONE ADVISORY CENTRE	ICAO LOC. IND.	AREA OF RESPONSIBILITY	PERIOD OF OPERATION ²⁾	MWO TO WHICH ADVISORY INFORMATION IS TO BE SENT	
				Name	ICAO LOC. IND.
1	2	3	4	5	6
New Delhi (India)	VIDP	1) Bay of Bengal 2) Arabian Sea N: Coastline S: 5°N W: Coastline E: 100°E	April – June October – December	<i>Bahrain</i>	<i>OBBI</i>
				Chennai	VOMM
				Colombo	VCBI
				Dhaka	VGZR VGHS
				<i>Emirates</i>	<i>OMAE</i>
				Jakarta	WIII
				<i>Jeddah</i>	<i>OEJN</i>
				Karachi	OPKC
				Kuala Lumpur	WMKK
				<i>Kuwait</i>	<i>OKBK</i>
				Male	VRMM
				Mumbai	VABB
				<i>Muscat</i>	<i>OOMS</i>
				<i>Tehran</i>	<i>OIII</i>
				<i>Sana'a</i>	<i>OYSN</i>
Yangon	VYYY				
Réunion (France)	FMEE	Southwest Indian Ocean N: 0°S S: 40°S W: African Coastline E: 90°E	Throughout the year	<i>Antananarivo</i>	<i>FMMI</i>
				<i>Bloemfontein</i>	<i>FABL</i>
				Mumbai	VABB
				<i>Dar-es-Salaam</i>	<i>HTDA</i>
				<i>Durban</i>	<i>FADN</i>
				<i>Gaborone</i>	<i>FBSK</i>
				<i>Harare</i>	<i>FVHA</i>
				<i>Johannesburg</i>	<i>FAJS</i>
				<i>Lilongwe</i>	<i>FWLI</i>
				<i>Mahé</i>	<i>FSIA</i>
				Male	VRMM
				<i>Maputo</i>	<i>FQMA</i>
				<i>Mauritius</i>	<i>FIMP</i>
				Melbourne (World Met Centre, BoM) ³⁾	YMMC
				<i>Nairobi</i>	<i>HKJK</i>
Perth	YPRF				

TROPICAL CYCLONE ADVISORY CENTRE	ICAO LOC. IND.	AREA OF RESPONSIBILITY	PERIOD OF OPERATION ²⁾	MWO TO WHICH ADVISORY INFORMATION IS TO BE SENT	
				Name	ICAO LOC. IND.
1	2	3	4	5	6
Tokyo (Japan)	RJTD	Western Pacific (incl. South China Sea) N: 60°N S: 0°N W: Coastline E: 180°E		Bangkok Beijing Chengdu Gia Lam Guangzhou Haikou Hong Kong Honolulu Incheon Jakarta <i>Kansas City</i> Kuala Lumpur Manila Nadi Phnom-Penh ⁵⁾ Shanghai Singapore Sunan Taibei Tokyo Ujung Pandang Vientiane	VTBS ZBAA ZUUU VVGL ZGGG ZJHK VHHH PHFO RKSI WIII <i>KMKC</i> WMKK RPLL NFFN VDPP ZSSS WSSS ZKPY RCTP RJTD WAAA VLVT

NOTES:

- 1) Co-ordinates of the area of responsibility of the Nadi Tropical Cyclone Advisory Centre to be confirmed.
- 2) Indicates approximately the main seasons for tropical cyclones.
- 3) Tropical cyclone SIGMET for the Australian FIRs is issued by MWOs: Brisbane, Darwin and Perth.
- 4) MWO not implemented, however, arrangement made for issuance of SIGMET by Port Moresby MWO
- 5) MWO not implemented, however, arrangement made for issuance of SIGMET by Chengdu MWO

APPENDIX C**FASID Table MET 3B****VOLCANIC ASH ADVISORY CENTRES**

EXPLANATION OF THE TABLE

Column

1. Name of the volcanic ash advisory centre (VAAC).
2. ICAO location indicator of VAAC (for use in the WMO heading of advisory bulletin).
3. Area of responsibility for the preparation of advisory information on volcanic ash by the VAAC in column 1.
4. ICAO Contracting State where the MWOs and ACCs/FICs are located.
5. ICAO region where the MWOs and ACCs/FICs are located.
6. MWOs to which the information on volcanic ash should be sent.
7. ICAO location indicator of the MWOs in column 6.
8. ACCs/FICs to which the information on volcanic ash should be sent.
9. ICAO location indicator of the ACCs/FICs in column 8.

Note: MWOs and ACCs/FICs in italics are situated outside the ASIA/PAC Region

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
Anchorage (United States)	PAWU	Anchorage Oceanic Anchorage Continental Anchorage Arctic and west to E150, north of N60	China	APAC	Haikou/Meilan	ZJHK	Sanya	ZJSA
			Russian Federation	EUR	<i>Anadyr</i>	<i>UHMA</i>	<i>Anadyr Shmidt Cape</i>	<i>UHMA UHMI</i>
					<i>Magadan</i>	<i>UHMM</i>	<i>Magadan</i>	<i>UHMM</i>
					<i>Tiksi</i>	<i>UEST</i>	<i>Tiksi</i>	<i>UEST</i>
					<i>Zyryanka</i>	<i>UESU</i>	<i>Zyryanka</i>	<i>UESU</i>
			USA	NAM	<i>Anchorage</i>	<i>PAWU</i>	<i>Anchorage</i>	<i>PAZA</i>
<i>Kansas City</i>	<i>KKCI</i>	<i>Kansas City</i>			<i>KKCI</i>			
Darwin (Australia)	YPDM	Southward from N10 and from E100 to E160 and the Melbourne FIR between E100 and E75, Colombo FIR and those parts of the Kuala Lumpur, Bangkok, Chennai, Yangon and Kolkata FIRs lying within N10 E100 to N20 E100 to N20 E82 to N10 E82 to N6 E78 to S2 E78 to S6 E75	Australia	APAC	Adelaide ³⁾	YPRM	Adelaide	YPAD
			Thailand	APAC	Bangkok	VTBS	Bangkok	VTBB
			Australia	APAC	Brisbane ³⁾	YBRF	Brisbane Cairns	YBBN YBCS
			Australia	APAC	Cairns ³⁾	YBCS	Townsville	YBTL
			India	APAC	Chennai	VOMM	Chennai	VOMF
			Sri Lanka	APAC	Colombo	VCBI	Colombo	VCBI
			Australia	APAC	Darwin	YDRM	Darwin	YPDN
			Viet Nam	APAC	Gia Lam	VVGL	Hanoi Ho-Chi-Minh	VVNB VVTS
			Australia	APAC	Hobart ³⁾	YMHF	Hobart	YMHB
			Solomon I.	APAC	Honiara ¹⁾	AGGH	Honiara	AGGH
			Indonesia	APAC	Jakarta	WIII	Jakarta	WIIF
			Malaysia	APAC	Kuala Lumpur	WMKK	Kota Kinabalu Kuala Lumpur	WBFC WMFC
			Philippines	APAC	Manila	RPLL	Manila	RPHI
			Australia	APAC	Melbourne (World Met Centre, BoM)	YMMC	Melbourne	YMMM
			Australia	APAC	Melbourne ³⁾	YMRF	Melbourne	YMMM
			Australia	APAC	Perth ³⁾	YPRF	Perth	YPPH
			Papua New Guinea	APAC	Port Moresby	AYPY	Port Moresby	AYPM
			Singapore	APAC	Singapore	WSSS	Singapore	WSJC
			Australia	APAC	Sydney ³⁾	YSRF	Sydney	YSSY
			Indonesia	APAC	Ujung Pandang	WAAA	Ujung Pandang	WAAF
Myanmar	APAC	Yangon	VYYY	Yangon	VYYY			

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
Tokyo (Japan)	RJTD	N60 to N10 – and from E90 to Oakland Oceanic and Anchorage Oceanic and Continental FIR boundaries minus the region bounded by N10, N20, E90 and E100	Russian Federation	EUR	<i>Artiom (Vladivostok)</i>	<i>UHWW</i>	<i>Vladivostok</i>	<i>UHWW</i>
			Thailand	APAC	Bangkok	VTBS	Bangkok	VTBB
			Russian Federation	EUR	<i>Blagoveshchensk</i>	<i>UHBB</i>	<i>Blagoveshchensk</i>	<i>UHBB</i>
			China	APAC	Beijing	ZBAA	Beijing Huhhot Taiyuan	ZBPE ZBHH ZBYN
			Russian Federation	EUR	<i>Chita</i>	<i>UIAA</i>	<i>Chita</i>	<i>UIAA</i>
			Russian Federation	EUR	<i>Chulman (Nerungri)</i>	<i>UELL</i>	<i>Chulman</i>	<i>UELL</i>
			Viet Nam	APAC	Gia Lam	VVGL	Hanoi Ho-Chi-Minh	VVNB VVTS
			China	APAC	Guangzhou	ZGGG	Guangzhou Changsha Guilin Nanning	ZGZU ZGCS ZGKL ZGNN
			China	APAC	HAIKOU/Meilan	ZJHK	Sanya	ZJSA
			China	APAC	Hong Kong	VHHH	Hong Kong	VHHK
			Republic of Korea	APAC	Incheon	RKSI	Incheon	RKRR
			Russian Federation	EUR	<i>Irkutsk</i>	<i>UIII</i>	<i>Irkutsk</i>	<i>UIII</i>
			Russian Federation	EUR	<i>Khabarovsk</i>	<i>UHHH</i>	<i>Khabarovsk</i>	<i>UHHH</i>
			China	APAC	Chengdu	ZUUU	Kunming Chengdu Chongqing	ZPKM ZUDS ZUCK
			China	APAC	Xi'an	ZLXY	Lanzhou Xi'an	ZLAN ZLHW ZLSN
			Russian Federation	EUR	<i>Magadan</i>	<i>UHMM</i>	<i>Magadan</i>	<i>UHMM</i>
			Philippines	APAC	Manila	RPLL	Manila	RPHI
			Cambodia	APAC	Phnom Penh ²⁾	VDPP	Phnom-Penh	VDPP
DPR Korea	APAC	Sunan	ZKPY	Pyongyang	ZKKP			

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
			China	APAC	Shanghai	ZSSS	Shanghai Hefei Jinan Nanchang Nanjing Xiamen Qingdao	ZSHA ZSOF ZSTN ZSCN ZSNJ ZSAM ZSQD
			China	APAC	Shenyang	ZYTX	Shenyang Dalian Hailar Harbin	ZYSH ZYTL ZBLA ZYHB
			China	APAC	Taibei	RCTP	Taibei	RCAA
			Japan	APAC	Tokyo	RJTD	Sapporo Tokyo Fukuoka Naha	RJCG RJTG RJDG RORG
			Mongolia	APAC	Ulaanbaatar	ZMUB	Ulaanbaatar	ZMUB
			China	APAC	Urumqi	ZWWW	Urumqi	ZWWW ZWUQ
			Lao PDR	APAC	Vientiane	VLVT	Vientiane	VLVT
			China	APAC	Wuhan	ZHHH	Wuhan	ZHWH
			Russian Federation	EUR	<i>Yelizovo (Petropavlovsk-Kamchatsky)</i>	<i>UHPP</i>	<i>Petropavlovsk-Kamchatsky</i>	<i>UHPP</i>
			Russian Federation	EUR	<i>Yuzhno-Sakhalinsk</i>	<i>UHSS</i>	<i>Yuzhno-Sakhalinsk</i>	<i>UHSS</i>
Toulouse (France)	LFPW	Africa Continental Europe West Asia	India	APAC	Chennai	VOMM	Chennai FIR and SRR	VOMF
			India	APAC	Delhi/Indira Gandhi Intl	VIDP	Delhi FIR and SRR	VIDF
			Afghanistan	APAC	Kabul AD	OAKM	Kabul FIR and SRR	OAKX
			Pakistan	APAC	Karachi/Jinnah Int'l	OPKC	Karachi FIR and SRR	OPKR
			Nepal	APAC	Kathmandu	VNKT	Kathmandu FIR and SRR	VNSM
			India	APAC	Kolkata	VECC	Kolkata FIR and SRR	VECF
			Pakistan	APAC	Lahore/Allama Iqbal Int'l	OPLA	Lahore FIR and SRR	OPLR
			Maldives	APAC	Male/Intl	VRMM	Male FIR and SRR	VRMM
			India	APAC	Mumbai/Chhatrapati Shivaji Intl.	VABB	Mumbai FIR and SRR	VABF
			China	APAC	Urumqi/Diwopu	ZWWW	Urumqi FIR and SSR	ZMUQ

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
			Bangladesh	APAC	Zia Intl. Airport, Dhaka Hazrat Shahjalal International Airport	VGZR VGHS	Dhaka FIR and SRR	VGFR
Washington (United States)	KNES	Oakland Oceanic FIR	USA	NAM	Honolulu Kansas City	PHFO KKCI	Oakland Oceanic	KZAK
							Guam	PGZU
			Fiji	APAC	Nadi	NFFF	Nadi	NFFF
Wellington (New Zealand)	NZKL	Southward from the Equator and from E160 to W140, and Southward from S10 and from W140 to W90	Australia	APAC	Brisbane ³⁾	YBRF	Brisbane	YBBN
			Australia	APAC	Darwin	YDRM	Darwin	YPDN
			USA	APAC	Honolulu	PHFO	Oakland Oceanic	KZAK
			Solomon I.	APAC	Honiara ¹⁾	AGGH	Honiara	AGGH
			Australia	APAC	Melbourne ³⁾	YMRF	Melbourne	YMMM
			Fiji	APAC	Nadi	NFFN	Nadi	NFFF
			Nauru	APAC	Nauru ¹⁾	ANYN	Nauru	ANAU
			Australia	APAC	Sydney ³⁾	YSRF	Sydney	YSSY
			French Polynesia	APAC	Tahiti	NTAA	Tahiti	NTTT
New Zealand	APAC	Wellington (Aviation Weather Centre)	NZKL	Auckland Christchurch	NZZO NZZC			

Notes: –

- 1) MWO not implemented, however, arrangement made for issuance of SIGMET by Port Moresby MWO.
- 2) MWO not implemented, however, arrangement made for issuance of SIGMET by Chengdu MWO.
- 3) MWO Darwin is designated to issue VA SIGMET for Brisbane and Melbourne FIRs.

APPENDIX D

LIST OF THE ABBREVIATIONS AND CODE WORDS USED IN SIGMET

ABV	Above
AND*	And
APRX	Approximate or approximately
AT	At <i>(followed by time at which weather change is forecast to occur)</i>
BLW	Below
BY*	By
CB	Cumulonimbus
CENTRE*	Centre <i>(used to indicate tropical cyclone centre)</i>
CLD	Cloud
CNL	Cancel or cancelled
CTA	Control area
DS	Duststorm
E	East or eastern longitude
ERUPTION*	Eruption <i>(used to indicate volcanic eruption)</i>
EMBD	Embedded in a layer <i>(to indicate CB embedded in layer of other clouds)</i>
FCST	Forecast
FIR	Flight information region
FL	Flight level
FRQ	Frequent
FZRA	Freezing rain
GR	Hail
HVY	Heavy <i>(used to indicate intensity of weather phenomena, e.g. HVY RA = heavy rain)</i>
ICE	Icing
INTSF	Intensify or intensifying
ISOL	Isolated
KM	Kilometres
KMH	Kilometres per hour
KT	Knots
LINE*	Line
MOD	Moderate <i>(used to indicate intensity of weather phenomena, e.g. MODRA = moderate rain)</i>
MOV	Move or moving or movement
MT	Mountain
MTW	Mountain waves
N	North or northern latitude
NC	No change
NE	North-east
NM	Nautical miles
NW	North-west
OBS	Observe or observed or observation
OBSC	Obscure or obscured or obscuring
OCNL	Occasional or occasionally
OF*	Of ... <i>(place)</i>
RA	Rain
RDOACT*	Radioactive
S	South or southern latitude
SE	South-east
SEV	Severe <i>(used e.g. to qualify icing and turbulence reports)</i>

SFC	Surface
SIGMET	Information concerning en-route weather phenomena which may affect the safety of aircraft operations
SQL	Squall line
SS	Sandstorm
STNR	Stationary
SW	South-west
TC	Tropical cyclone
TO	To ... (<i>place</i>)
TOP	Cloud top
TS	Thunderstorm (in aerodrome reports and forecasts, TS used alone means thunder heard but no precipitation at the aerodrome)
TURB	Turbulence
UIR	Upper flight information region
VA	Volcanic ash
VALID*	Valid
W	West <i>or</i> western longitude
WI	Within
WID	Width
Z	Coordinated Universal Time (<i>in meteorological messages</i>)

* not in the ICAO Doc 8400, ICAO Abbreviations and Codes

APPENDIX E

METEOROLOGICAL PHENOMENA TO BE REPORTED BY SIGMET

Phenomenon	Description	Meaning
TS	OBSC ² TS EMBD ³ TS FRQ ⁴ TS SQL ⁵ TS OBSC TSGR EMBD TSGR FRQ TSGR SQL TSGR	Obscured thunderstorm(s) Embedded thunderstorm(s) Frequent thunderstorm(s) Squall line thunderstorm(s) Obscured thunderstorm(s) with hail Embedded thunderstorm(s) with hail Frequent thunderstorm(s) with hail Squall line thunderstorm(s) with hail
TC	TC (+ TC name)	Tropical cyclone (+ TC name)
TURB	SEV TURB ⁶	Severe turbulence
ICE	SEV ICE SEV ICE FZRA	Severe icing Severe icing due to freezing rain
MTW	SEV MTW ⁷	Severe mountain wave
DS	HVY DS	Heavy duststorm
SS	HVY SS	Heavy sandstorm
VA	VA (+ volcano name, if known)	Volcanic ash (+ volcano name)
RDOACT CLD	RDOACT CLD	Radioactive cloud

Notes:

1. Only one of the weather phenomena listed should be selected and included in each SIGMET
2. Obscured (**OBSC**) indicates that the thunderstorm (including, if necessary, CB-cloud which is not accompanied by a thunderstorm) is obscured by haze or smoke or cannot be readily seen due to darkness
3. Embedded (**EMBD**) – indicates that the thunderstorm (including, if necessary, CB-cloud which is not accompanied by a thunderstorm) is embedded within cloud layers and cannot be readily recognized
4. Frequent (**FRQ**) indicates an area of thunderstorms within which there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75% of the area affected, or forecasts to be affected, by the phenomenon (at a fixed time or during the period of validity)
5. Squall line (**SQL**) indicates thunderstorms along a line with little or no space between individual clouds
6. Severe (**SEV**) turbulence (**TURB**) refers only to:
 - low-level turbulence associated with strong surface winds;
 - rotor streaming;
 - turbulence whether in cloud or not in cloud (CAT) near to jet streams.

Turbulence is considered severe whenever the peak value of the cube root of EDR exceeds 0.7.

7. *A mountain wave (MTW) is considered severe – whenever an accompanying downdraft of 3.0 m/s (600 ft/min) or more and/or severe turbulence is observed or forecast.*

APPENDIX F

STANDARD FOR REPORTING GEOGRAPHICAL COORDINATES IN SIGMETS

When reporting geographical coordinates of points in SIGMET the following should apply:

1. Each point is represented by a latitude/longitude coordinates in whole degrees or degrees and minutes in the form:

N(S)nn[nn] W(E)nnn[nn]

Note: There is a space between the latitude and longitude value.

Examples: **N3623 W04515**
 S1530 E12500
 N42 E023

2. In describing lines or polygons, the lat, lon values of the respective points are separated by the combination space-hyphen-space, as in the following examples:

S0530 E09300 – N0100 E09530 – N1215 E11045 – S0820 E10330

S05 E093 – N01 E095 – N12 E110 – S08 E103

Note: It is not necessary to repeat the first point when describing a polygon.

3. When describing a volcanic ash cloud approximate form and position, a limited number of points, which form a simplified geometric figure (a line, or a triangle, or quadrangle, etc.) should be used in order to allow for a straightforward interpretation by the user.

3. Reporting a phenomenon occupying two different geographical areas within the FIR. This is frequently the case with two (or more) separate TS formations occurring in different parts of the FIR at the same time. The question is whether a separate SIGMET should be issued for each formation, or, one SIGMET could include location description for two (or more) geographical areas. The current SIGMET format does not allow for reporting of more than one phenomenon or two different TS areas. Therefore, in cases like this, two separate SIGMETs should be issued. The main concern with issuing separate SIGMETs is that, in general, a new SIGMET for the same FIR would replace the previous one; this may lead to rejecting valid information in case as described above. It should be noted in this regard, that the current SIGMET format allows for using different sequence numbers and thus, for keeping more than one SIGMET at a time valid for the FIR concerned; for instance, a series A1, A2,... could be used for “phenomenon A” and B1, B2, ... , for “phenomenon B”.

4. Location with reference to **LINE**. **LINE** is defined as a straight line between two points drawn on a map in Mercator projection or a straight line between two points which crosses lines of longitude at a constant level.

Example: **NE OF LINE S2520 W11510 – S2730 W12010**

APPENDIX G

EXAMPLES

Note: Most examples are based on real SIGMETs mainly from Asia/Pacific region with some exceptions. The real SIGMETs have been corrected in order to make them compliant with the Annex 3 format.

1. SIGMET

SIGMET for thunderstorms

WSSR20 WSSS 091131
 WSJC SIGMET 3 VALID 091140/091540 WSSS-
 WSJC SINGAPORE FIR EMBD TS OBS AT 1130Z N OF N01 E OF E106 W OF E114 STNR NC=

WSNT03 KKCI 032340
 KZNY SIGMET C17 VALID 032345/040345 KKCI-
 KZNY NEW YORK OCEANIC FIR FRQ TS OBS WI AREA N2400 W05500 - N2300 W04930 -
 N1845 W05645 - N2100 W05800 - N2400 W05500 TOP FL450 MOV E 15KT INTSF=

WSVS31 VVGL 122305
 VVTS SIGMET 9 VALID 122330/130230 VVGL-
 VVTS HOCHIMINH FIR EMBD TS OBS S OF LINE N1420 E10930 - N1000 E10400 TOP
 FL280 MOV W 10KMH WKN=

WSUK31 EGGY 121120
 EGTG SIGMET 01 VALID 121125/121525 EGRR-
 EGTG LONDON FIR EMBD TSGR OBS AT 1115Z SE OF LINE N5130 E00200 - N5000 W00400
 TOPS FL220 MOV NE 30KT NC=

1.2 SIGMET for severe turbulence

WSAU21 AMMC 280546
 YBBB SIGMET BS02 VALID 280600/281000 YMMC-
 YBBB BRISBANE FIR SEV TURB FCST AT 0600Z WI S3900 E15100 - S4300 E15100 -
 S4300 E16000 - S4100 E16300 - S3700 E16300 - S3900 E16000 FL260/370 MOV E 20
 KT NC=

WSNZ21 NZKL 280003
 NZZC SIGMET 01 VALID 280002/280402 NZKL-
 NZZC NEW ZEALAND FIR SEV TURB OBS NE OF THE SOUTH ISLAND BLW FL100 STNR NC=

At 1358 UTC, an aircraft report of moderate turbulence in clear air in the HONG KONG FIR was received by VHHH. Considering the presence of meteorological factors favourable to the intensification of turbulence, severe turbulence is forecast over the area concerned. As the intensity of the aircraft report is not severe, "SEV TURB OBS" should not be used (and issuance of special air-report is not required). Instead, "SEV TURB FCST" is to be used. A SIGMET with the beginning of the period of validity coinciding with the time of commencement of the phenomenon (SIGMET Guide Section 3.4.3.1.3) is to be issued (FCST AT <GGgg>Z in accordance with Amendment 75 to Annex 3):

WSSS20 VHHH 071410
 VHHK SIGMET 1 VALID 071410/071800 VHHH-
 VHHK HONG KONG FIR SEV TURB FCST AT 1410Z N OF N2200 E OF E11330
 FL300/400 MOV E 10KT INTSF=

If the intensity of the turbulence reported by the aircraft is severe, "SEV TURB OBS" should be used:

WSSS20 VHHH 071410
 VHHK SIGMET 1 VALID 071410/071800 VHHH-
 VHHK HONG KONG FIR SEV TURB OBS AT 1358Z
 N OF N2200 E OF E11330 FL300/400 MOV E 10KT INTSF=

1.3 SIGMET for severe icing

WSFR31 LFPW 280400
 LFMM SIGMET 2 VALID 280500/280900 LFMM-
 LFMM FIR MARSEILLE SEV ICE OBS AT 0400Z LION GULF FL040/100 STNR NC=

WSIY31 LIIB 032152
 LIMM SIGMET 07 VALID 032200/040200 LIMM-
 LIMM MILANO FIR SEV ICE FCST AT 2200Z OVER ALPS AND N PART APPENNINIAN AREA
 FL030/120 MOV E NC=

1.4 SIGMET for heavy duststorm

WSAW31 LOWM 160530
 OEJD SIGMET 4 VALID 160600/161000 OEJN-
 OEJD JEDDAH FIR HVY DS OBS N OF N2200 S OF N3100 E OF E04440 W OF E04800 MOV
 E 10KMH NC=

1.5 SIGMET for severe mountain wave

WSUK31 EGGY 150550
 EGTG SIGMET 03 VALID 150600/151000 EGRR-
 EGTG LONDON FIR SEV MTW FCST AT 0600Z N OF N5100 FL090/140 STNR WKN=

1.6 SIGMET for radioactive cloud

FF WSSSYMYX
 230655 RJTDYPYX
 WSJP31 RJTD 230700
 RJJJ SIGMET 2 VALID 230700/231100 RJTD-
 RJJJ FUKUOKA FIR RDOACT CLD FCST WI N3714 E14047 - N3709 E14102 -
 N3714 E14116 - N3725 E14122 - N3737 E14116 - N3742 E14102 - N3737
 E14047 - N3725 E14041 - N3714 E14047 STNR INTST UNKNOWN=

2. VA SIGMET

2.1 VA SIGMET - full

WVPH01 RPLL 211110
 RPHI SIGMET 2 VALID 211100/211700 RPLL-
 RPHI MANILA FIR VA ERUPTION MT PINATUBO PSN S1500 E07348

VA CLD OBS AT 1100Z FL310/450 APRX 220KM BY 35KM S1500 E07348 - S1530 E07642
 MOV SE 65KMH FCST 1700Z VA CLD APRX S1506 E07500 - S1518 E08112 - S1712
 E08330 - S1824 E07836=

Note:

1. *The coordinates used in describing the VA cloud are fictitious.*

2.2 “Short” first SIGMET (no FCST)

YUDD SIGMET 2 VALID 211100/211700 YUSO-
 YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN S1500 E07348
 VA CLD OBS AT 1100Z FL310/450 APRX 220KM BY 35KM S1500 E07348 - S1530 E07642
 MOV SE 65KMH FCST 1700Z VA CLD APRX S1506 E07500 - S1518 E08112 - S1712
 E08330 - S1824 E07836=

or

YUDD SIGMET 2 VALID 211100/211700 YUSO-
 YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN S1500 E07348
 VA CLD OBS AT 1100Z FL100/180 APRX 220KM BY 35KM S1500 E07348 - S1530 E07642=

WVFX01 NFFN 090900
 NFFF SIGMET 03 VALID 090915/091515 NFFN-
 NFFF NADI FIR VA ERUPTION MT LOPEVI PSN S1630 E16820 VA CLD OBS AT 0330Z
 FL090 APRX 10NM BY 10NM MOV SE 25KT FCST 1515Z VA CLD APPRX S1630 E16820 -
 S1900 E17600 - S1930 E17030=

2.3 SIGMET for VA CLD in the FIR but the volcano information is unknown

YUDD SIGMET 2 VALID 211100/211700 YUSO-
 YUDD SHANLON FIR/UIR VA CLD OBS AT 1100Z FL310/450 APRX 220KM BY 35KM S1500
 E07348 - S1530 E07642 MOV SE 65KMH FCST 1700Z VA CLD APRX S1506 E07500 -
 S1518 E08112 - S1712 E08330 - S1824 E07836=

2.4 SIGMET for VA CLD forecast to affect the FIR

We assume that the responsible VAAC has issued an advisory at 0200Z with forecast positions of the VA CLD for 0800Z, 1400Z and 2000Z. From this forecast it is seen that the VA CLD will enter the YUDD FIR around 0800Z. The responsible MWO, YUSO receiving this advisory prepares a SIGMET for the expected penetration of the VA cloud in its FIR and this SIGMET is sent at 0230Z.

WVXY01 YUSO 210230
 YUDD SIGMET 2 VALID 210800/211400 YUSO-
 YUDD SHANLON FIR/UIR VA CLD FCST AT 0800Z FL310/450 APRX 220KM BY 35KM S1500
 E07348 - S1530 E07642 MOV SE 65KMH FCST 1400Z VA CLD APRX S1506 E07500 -
 S1518 E08112 - S1712 E08330 - S1824 E07836=

Notes:

1. *The forecast positions at 0800Z and 1400Z are taken from the VA advisory.*

2.5 SIGMETs associated with Mount Soputan Eruption

WVID21 WAAA 140600
 WAAZ SIGMET B01 VALID 140600/141200 WAAA-
 WAAZ UJUNG PANDANG FIR VA ERUPTION MT SOPUTAN PSN N0107 E12443
 VA CLD OBS AT 0600Z APRX SFC/FL200 N0110 E12440 - N0155 E12455 - N0130 E12530
 -N0110 E12440 MOV NE 10KT
 FCST 1200Z VA CLD APRX SFC/FL200 N0110 E12440 - N0230 E12455 - N0135 E12605 -
 N0110 E12440=

WVID21 WAAA 140800
 WAAZ SIGMET B02 VALID 140800/141400 WAAA-
 WAAZ UJUNG PANDANG FIR VA ERUPTION MT SOPUTAN PSN N0107 E12443
 VA CLD OBS AT 0800Z APRX SFC/FL200 N0110 E12440 - N0155 E12455 - N0130 E12530
 -N0110 E12440 MOV NE 10KT APRX FL200/FL350 N0200 E12345 - N0300 E12410 -
 N0310 E12250 - N0200 E12230 - N0200 E12345 MOV NW 25KT
 FCST 1400Z VA CLD APRX SFC/FL200 N0110 E12440 - N0230 E12455 - N0135 E12605 -
 N0110 E12440 APRX FL200/FL350 N0200 E12245 - N0320 E12305 - N0345 E12115 -
 N0220 E12115 - N0200 E12245=

WVID21 WAAA 141100
 WAAZ SIGMET B03 VALID 141100/141400 WAAA-
 WAAZ UJUNG PANDANG FIR CNL SIGMET B02 140800/141400=

WVID21 WAAA 140600
 WAAZ SIGMET A01 VALID 140600/141200 WAAA-
 WAAZ UJUNG PANDANG FIR VA ERUPTION MT SOPUTAN PSN N0107 E12443
 VA CLD OBS AT 0600Z APRX SFC/FL200 N0110 E12440 - N0155 E12455 - N0130 E12530
 -N0110 E12440 STNR
 FCST 1200Z VA CLD APRX SFC/FL200 N0110 E12440 - N0155 E12455 - N0130 E12530 -
 N0110 E12440 =

WVID21 WAAA 141100
 WAAZ SIGMET A02 VALID 141200/141800 WAAA-
 WAAZ UJUNG PANDANG FIR VA ERUPTION MT SOPUTAN PSN N0107 E12443
 VA CLD OBS AT 1100Z APRX SFC/FL200 N0110 E12440 - N0155 E12455 - N0130 E12530
 -N0110 E12440 MOV NE 10KT
 FCST 1800Z VA CLD APRX SFC/FL200 N0110 E12440 - N0230 E12455 - N0135 E12605 -
 N0110 E12440=

WVID21 WAAA 141700
 WAAZ SIGMET A03 VALID 141700/141800 WAAA-
 WAAZ UJUNG PANDANG FIR CNL SIGMET A02 141200/141800=

3. TC SIGMET

3.1. TC Graham – SIGMET issued by MWO Perth - Australia

WCOC31 APRF 280453
 YBBB SIGMET PH01 VALID 280500/281100 YPRF-
 YBBB BRISBANE FIR TC GRAHAM OBS AT 0400Z S1806 E12145 CB TOP FL450 WI 120NM
 OF CENTRE MOV SE 7KT INTSF FCST 1100Z TC CENTRE S1808 E12150=

3.2. SIGMET messages issued in July 2003 during the passage of TC Koni

WCSS20 VHHH 200240
 VHHK SIGMET 2 VALID 200900/201500 VHHH-
 VHHK HONG KONG CTA TC KONI OBS AT 0000Z N1618 E11506 CB TOP FL500 WI 90NM OF
 CENTRE MOV NW 8KT NC FCST 1500Z TC CENTRE N1749 E11347=

Note: This SIGMET is issued before the TC Koni started affecting the Hong Kong CTA, as seen from the issuing time and the start of validity time

WCSS20 VHHH 201150
 VHHK SIGMET 7 VALID 201200/201800 VHHH-
 VHHK HONG KONG CTA TC KONI OBS AT 0900Z N1712 E11400 CB TOP FL500 WI 90NM OF
 CENTRE MOV NW 10KT NC FCST 1800Z TC CENTRE N1810 E11300=

WCSS20 VHHH 201450
 VHHK SIGMET 10 VALID 201500/202100 VHHH-
 VHHK HONG KONG CTA TC KONI OBS AT 1200Z N1730 E11330 CB TOP FL500 WI 60NM OF
 CENTRE MOV NW 10KT NC FCST 2100Z TC CENTRE N1818 E11240=

Note: The two SIGMETs above are issued with an interval of 3 hours, which corresponds to the requirement for updating the TC SIGMETs at least every 6 hours. In the case of Hong Kong, China, the update interval has been selected to be 3 hours.

3.3. SIGMET messages issued by Hong Kong MWO with regards to TC Pabuk (includes WC and WS SIGMETs)

At 0200 UTC, TC Pabuk (with 10-minute mean surface wind speed of 34 knots or more) is observed by VHHH. The centre of Pabuk is observed outside the HONG KONG FIR but is expected to enter the HONG KONG FIR at 0400 UTC. As the TC has not yet been observed in the HONG KONG FIR, "FCST" should be used instead of "OBS" (SIGMET Guide Section 3.4.5.3). A TC SIGMET with a period of validity commencing at 0400 UTC for a maximum period of 6 hours (SIGMET Guide Section 3.4.2.3), and providing two forecast locations of the TC centre, pertaining to the beginning and end of the validity period respectively, is to be issued:

WCSS20 VHHH 080200
 VHHK SIGMET 3 VALID 080400/081000 VHHH-
 VHHK HONG KONG FIR TC PABUK FCST AT 0400Z N2224 E11730
 CB TOP FL450 WI 240NM OF CENTRE MOV W 15KT NC
 FCST 1000Z TC CENTRE N2224 E11600=

Before the commencement of the TC SIGMET, a thunderstorm SIGMET for warning thunderstorms associated with the TC affecting the HONG KONG FIR, if warranted, should be issued:

WSSS20 VHHH 080155
 VHHK SIGMET 2 VALID 080155/080555 VHHH-
 VHHK HONG KONG FIR EMBD TS FCST AT 0155Z N OF N20 E OF E114
 TOP FL450 MOV W 15KT INTSF=

At 0400 UTC, the TC SIGMET issued above, viz. SIGMET 3, would become effective. The thunderstorm SIGMET, viz. SIGMET 2, should be cancelled:

WSSS20 VHHH 080400

VHHK SIGMET 4 VALID 080400/080555 VHHH-
VHHK HONG KONG FIR CNL SIGMET 2 080155/080555=

However, if the time for the TC to enter the HONG KONG FIR turns out to be later than 0400 UTC, the thunderstorm SIGMET, viz. SIGMET 2, should be kept while the TC SIGMET, viz. SIGMET 3, should be updated to reflect the latest assessment, e.g. validity period.

At 1630 UTC, the centre of TC Pabuk is observed within HONG KONG FIR but it is expected to weaken into a tropical depression (with 10-minute mean surface wind speed of less than 34 knots) at 2100 UTC. A TC SIGMET with a period of validity commencing at 1630 UTC and ending at 2100 UTC is to be issued:

WCSS20 VHHH 081630
VHHK SIGMET 13 VALID 081630/082100 VHHH-
VHHK HONG KONG FIR TC PABUK OBS AT 1500Z N2218 E11612
CB TOP FL450 WI 240NM OF CENTRE MOV W 15KT WKN
FCST 2100Z TC CENTRE N2200 E11424=

However, if it turns out that TC Pabuk has already weakened into a tropical depression at 1800 UTC, SIGMET 13 should be cancelled and a thunderstorm SIGMET for warning thunderstorms associated with the TC affecting the HONG KONG FIR, if warranted, should be issued:

WSSS20 VHHH 081800
VHHK SIGMET 14 VALID 081800/082200 VHHH-
VHHK HONG KONG FIR EMBD TS FCST AT 1800Z N OF N2000
TOP FL450 MOV W 15KT WKN=

WCSS20 VHHH 081800
VHHK SIGMET 15 VALID 081800/082100 VHHH-
VHHK HONG KONG FIR CNL SIGMET 13 081630/082100=

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
XI'AN/Xianyang	ZLXY	WSCI37		WVCI37	ZLHW	
SHANGHAI/Hongqiao	ZSSS	WSCI34	WCCI34	WVCI34	ZSHA	
SHENYANG/Taoxian	ZYTX	WSCI38		WVCI38	ZYSH	
TAIBEI/Taibei Intl	RCTP	WSCI31	WCCI31	WVCI31	RCAA	
URUMQI/Diwopu	ZWWW	WSCI39		WVCI39	ZWUQ	
WUHAN/Tianhe	ZHHH	WSCI45		WVCI45	ZHWH	
HONG KONG/Hong Kong Intl	VHHH	WSSS20	WCSS20	WVSS20	VHHK	
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA						
SUNAN	ZKPY	WSKR31	WCKR31	WVKR31	ZKKP	
FIJI						
NADI/Nadi Intl	NFFN	WSFJ01,02,...	WCFJ01,02,...	WVFJ01,02,...	NFFF	
FRENCH POLYNESIA						
TAHITI/Faaa	NTAA	WSPF21,22	WCPF21	WVPF21	NTTT	
INDIA						
KOLKATA	VECC	WSIN31	WCIN31	WVIN31	VECF	
CHENNAI/Chennai	VOMM	WSIN31	WCIN31	WVIN31	VOMF	
DELHI/Indira Ghandi Intl	VIDP	WSIN31	WCIN31	WVIN31	VIDF	
MUMBAI/Chhatrapati Shivaji Intl.	VABB	WSIN31	WCIN31	WVIN31	VABF	
INDONESIA						
JAKARTA/Soekarno-Hatta (Comm Center)	WIII	WSID20	WCID20	WVID20	WIIZ	
UJUNG PANDANG/Hasanuddin (Comm Center)	WAAA	WSID21	WCID21	WVID21	WAAZ	
JAPAN						
TOKYO (CITY)	RJTD	WSJP31	WCJP31	WVJP31	RJJJ	
LAO PEOPLE'S DEMOCRATIC REPUBLIC						
VIENTIANE/Wattay	VLVT	WSLA31	WCLA31	WVLA31	VLVT	
MALAYSIA						
SEPANG/KL International Airport	WMKK	WSMS31	WCMS31	WVMS31	WBFC WMFC	

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
MALDIVES MALE/Intl	VRMM	WSMV31	WCMV31	WVMV31	VRMF	
MONGOLIA ULAAN BAATAR	ZMUB	WSMO31		WVMO31	ZMUB	
MYANMAR YANGON/Yangon International	VYYY	WSBM31	WCBM31	WVBM31	VYYY	
NAURU PORT MORESBY on behalf of NAURU (ANYN)	AYPY	WSNW20	WCNW20	WVNW20	ANAU	MWO not established however, SIGMET is provided by Port Moresby MWO
NEPAL KATHMANDU	VNKT	WSNP31		WVNP31	VNSM	SIGMET currently not issued
NEW ZEALAND WELLINGTON (AVIATION WEATHER CENTER)	NZKL	WSNZ21 WSPS21	WCNZ21 WCPS21	WVNZ21 WVPS21	NZZC NZZO	
PAKISTAN KARACHI/Jinnah Intl LAHORE/Allama Iqbal Intl	OPKC OPLA	WSPK31 WSPK31	WCPK31	WVPK31 WVPK31	OPKR OPLR	
PAPUA NEW GUINEA PORT MORESBY/Intl	AYPY	WSNG20	WCNG20	WVNG20	AYPY	
PHILIPPINES MANILA/Ninoy Aquino Intl, Pasay City, Metro Manila	RPLL	WSPH31	WCPH31	WVPH31	RPHI	
REPUBLIC OF KOREA INCHEON	RKSI	WSKO31	WCKO31	WVKO31	RKRR	
SINGAPORE SINGAPORE/Changi	WSSS	WSSR20	WCSR20	WVSR20	WSJC	

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
SOLOMON ISLANDS PORT MORESBY on behalf of HONIARA (Henderson - AGGH)	AYPY	WSSO20	WCSO20	WVSO20	AGGG	MWO not established however, SIGMET is provided by Port Moresby MWO
SRI LANKA COLOMBO/Bandaranaïke International Airport Colombo	VCBI	WSSB31	WCSB31	WVSB31	VCBI	
THAILAND BANGKOK/Suvarnabhumi Intl Airport	VTBS	WSTH31	WCTH31	WVTH31	VTBB	
UNITED STATES ANCHORAGE/Anchorage Intl HONOLULU/Honolulu Intl KANSAS CITY KANSAS CITY	PAWU PHFO KKCI KKCI	WSAK01-09 PAWU WSPA01-13 PHFO WSNT01-13 KKCI WSPN01-13 KKCI	WCAK01-09 PAWU WCPA01-13 PHFO WCNT01-13 KKCI WCPN01-13 KKCI	WVAK01-09 PAWU WVPA 01-13 PHFO WVNT01-13 KKCI WVPN01-13 KKCI	PAZA KZAK KZNY KZMA KZHU TJZU KZAK	
VIET NAM Gia Lam	VVGL	WSVS31	WCVS31	WVVS31	VVNB VVTS	

APPENDIX I

**WMO HEADINGS FOR TROPICAL CYCLONE AND VOLCANIC ASH ADVISORY
BULLETINS (FK and FV)**

USED BY ASIA/PAC TCACs and VAACs

Explanation of Table

- Col. 1: Name of the TCAC or VAAC
 - Col 2: ICAO location indicator used by the TCAC or VAAC
 - Col 3: WMO heading (TTAAii CCCC) of the FK or FV bulletin
 - Col 4: Remarks (e.g., Area of coverage of the advisory, or any other bulletin-specific information)
-

TCAC/VAAC (State)	ICAO location indicator	WMO Heading TTAAii CCCC	Remarks
1	2	3	4
TC Advisories (FK)			
Miami (United States)	KNHC	FKNT21-24 KNHC FKPZ21-25 KNHC	Atlantic For Northeast Pacific to 140W; ii = 21 – 25; up to 5 different bulletins possible at a time according to the number of TCs in the TCAC's area of resp.
Honolulu (United States)	PHFO	FKPA21-25 KHFO	For North Central Pacific: 140W – 180W; ii = 21 – 25; up to 5 different bulletins possible at a time according to the number of TCs in the TCAC's area of resp.
New Delhi (India)	VIDP	FKIN20 VIDP FKIN21 VIDP	Bay of Bengal Arabian Sea
Darwin (Australia)	ADRM	FKAU01 ADRM FKAU02 ADRM	Area bounded by Equator 125E, 15S 125E, 15S 129E, 32S 129E, 32S 138E, 14S 138E, 10S 141E, Equator 141E, Equator 125E. (Advisories prepared by Darwin)
		FKAU03 ADRM FKAU04 ADRM	Area bounded by 10S 141E, 14S 138E, 32S 138E, 32S 160E, 5S 160E, 8S 155E, 12S 155E, 12S 147E, 9S 144E, 10S 141E and Port Moresby TCWC area. (Advisories prepared by Brisbane)

TCAC/VAAC (State)	ICAO location indicator	WMO Heading TTAAii CCCC	Remarks
1	2	3	4
		FKAU05 ADRM FKAU06 ADRM	Area bounded by 10S 90E, 36S 90E, 36S 129E, 15S 129E, 15S 125E, 10S 125E, 10S 90E, and the interim Indonesia area. (Advisories prepared by Perth)
Nadi (Fiji)	NFFN	FKPS01 NFFN	
Tokyo (Japan)	RJTD	FKPQ30-35 RJTD	
Réunion (France)	FMEE	FKIO20 FMEE	Southwest Indian Ocean N: 0°S S: 40°S W: African Coastline E: 90°E
VA Advisories (FV)			
Anchorage (United States)	PAWU	FVAK21-25 PAWU	ii = 21 – 25; up to 5 different bulletins possible at a time according to the number of VA clouds in the VAAC's area of resp.
Darwin (Australia)	ADRM	FVAU01-06 ADRM	
Tokyo (Japan)	RJTD	FVFE01 RJTD	
Toulouse (France)	LFPW	FVXX01 LFPW	
Washington (United States)	KNES	FVXX20-27 KNES	ii = 20 – 27; up to 8 different bulletins possible at a time according to the number of VA clouds in the VAAC's area of responsibility
Wellington (New Zealand)	NZKL	FVPS01 NZKL	

APPENDIX J

ASIA/PAC SIGMET TEST PROCEDURES

(Revision July 2011)

1. Introduction

1.1 The MET Divisional Meeting (2002) formulated Recommendation 1/12 b), *Implementation of SIGMET requirements*, which called, *inter alia*, for the relevant planning and implementation regional groups (PIRGs) to conduct periodic tests of the issuance and reception of SIGMET messages, especially those for volcanic ash.

1.2 The Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) recognized that, since SIGMET was irregular non-scheduled information, the periodic tests would facilitate the monitoring of SIGMET availability and the identification of deficiencies in the dissemination procedures. Based on the results of the tests, States would be provided with specific advice aimed at improving their SIGMET-related practices and procedures. Therefore, the fifteenth meeting of APANPIRG held in Bangkok, 23 to 27 August 2004, adopted Conclusion 15/42, as follows:

Conclusion 15/42 – Conducting SIGMET tests in the Asia/Pacific region

That, ICAO Regional Office invite all TCAC and VAAC Provider States in the Asia/Pacific region, and all Asia/Pacific States with MWOs responsible for issuance of SIGMET for volcanic ash and/or tropical cyclones, to take part in the SIGMET tests to be carried out according to procedures developed by the VA/TC Implementation Task Force (became METWARN/I TF in July 2010)

Note: ICAO Regional Office will coordinate the tests and notify the participating States about their schedule and procedures.

1.3 The Meteorological Advisories and Warnings Implementation Task Force (METWARN/I TF), in coordination with the OPMET Management Task Force (OPMET/M TF) and the Regional Office, Bangkok, developed the procedures for conducting regional SIGMET tests as described in this document. The test procedures encompass all the three types of SIGMET, as follows:

- SIGMET for volcanic ash (WV SIGMET);
- SIGMET for tropical cyclones (WC SIGMET); and
- SIGMET for other weather phenomena (WS SIGMET).

1.4 The requirements for dissemination of SIGMET are specified in Annex 3, Appendix 6, 1.2. The updated Regional guidance on the preparation and dissemination of SIGMET adopted by APANPIRG/18 is provided in the *ASIA/PAC Regional SIGMET Guide*, available at:

http://www.bangkok.icao.int/edocs/sigmet_guide4.pdf

2. Purpose and Scope of SIGMET tests

2.1 The purpose of the SIGMET tests is to check the awareness of participating MWOs of the ICAO requirements for the issuance of SIGMET and the compliance of the States' procedures for preparation and dissemination of SIGMET bulletins with the relevant ICAO Standards and Recommended Practices (SARPs) and regional procedures.

2.2 In the case of for tropical cyclones and volcanic ash clouds (referred hereafter as WC SIGMET and WV SIGMET respectively) the scope of the tests is to check also the interaction between the Tropical Cyclone Advisory Centres (TCAC) and Volcanic Ash Advisory Centres (VAAC), and the MWOs in their areas of responsibility. Therefore, for the WC and WV SIGMET tests the issuance of TEST SIGMET by the MWO should be triggered by a test advisory issued by the respective TCAC or VAAC.

2.3 The Regional OPMET Data Banks (RODB) will monitor the dissemination by filing all TEST SIGMETs and advisories and the corresponding reception times. The monitoring results will be provided in the WC, WV and WS form of summaries to the SIGMET test focal points given in section 3.4.3 with a copy to the Regional Office, Bangkok.

2.4 A consolidated summary report will be prepared by both parties and submitted to the Regional Office. The report will include recommendations for improvement of the SIGMET exchange and availability. The results of the tests should be reported to the Conjoint meeting of the OPMET/M TF and METWARN/I TF and to the CNS/MET Sub-group meetings.

2.5 Participating States, for which discrepancies of the procedures or other findings are identified by the tests, will be advised by the Regional Office and requested to take necessary corrective action.

3. SIGMET test procedures

3.1 Procedures for WC and WV SIGMET tests

3.1.1 Participating units:

3.1.1.1 Tropical Cyclone Advisory Centre (TCAC):

Darwin
Honolulu
Miami
Nadi
New Delhi
Tokyo
Réunion

3.1.1.2 Volcanic Ash Advisory Centres (VAAC):

Anchorage
Darwin
Tokyo
Toulouse
Washington
Wellington

3.1.1.3 Regional OPMET Data Banks (RODB):

Bangkok
Brisbane
Nadi
Singapore
Tokyo

3.1.1.4 Meteorological Watch Offices (MWO):

All MWOs listed in FASID Tables MET 3A and MET 3B of the ASIA/PAC Basic ANP and FASID (Doc 9673), under the responsibility of the corresponding VAACs and TCACs.

Notes: 1) The participation of MWOs of States outside ASIA/PAC region, but listed in FASID Tables MET 3A and MET 3B should be coordinated through the ICAO Regional Office concerned.

2) FASID Tables MET 3A and MET 3B are reproduced in the Regional SIGMET Guide:

http://www.bangkok.icao.int/edocs/sigmet_guide4.pdf

3) MWOs in MID Region under TCAC New Delhi plan to participate in WC SIGMET test (10 November 2010)

3.1.2 WV/WC SIGMET Test messages

On the specified date for the test at **0200 UTC** (if not otherwise advised by the Regional Office) the participating VAAC and TCAC should issue a TEST VA or TC advisory. The structure of the TEST advisories should follow the standard format given in Annex 3 with indication that it is a test message as shown on pages J-7 and J-8.

To accommodate the MID Region in the WC SIGMET Test, TCAC New Delhi will issue a test TC advisory at **0800 UTC** on the specified date for the test in addition to the **0200 UTC** test advisory. *To clarify, only MWOs in the ASIA Region that receive a TC test advisory from TCAC New Delhi at 0200 UTC will issue a WC SIGMET test message. Likewise, only MWOs in the MID Region that receive a TC test advisory from TCAC New Delhi at 0800 UTC will issue a WC SIGMET test message.*

MWOs, upon receipt of the TEST VA or TC advisory, should issue a TEST SIGMET for volcanic ash or tropical cyclone, respectively, and send it to all RODBs. The WMO heading and the first line of the SIGMET should be valid ones, while the body of the message should contain only explanatory note regarding the test in plain language, as shown on pages J-7 and J-8. The period of validity of the TEST SIGMET should be very short, e.g., 10 minutes.

To avoid over-writing of a valid SIGMET, a TEST SIGMET for VA or TC should not be sent in the case where there is a valid SIGMET of the same type for the MWO's area of responsibility. However, in this case the responsible MWO should notify the WV/WC SIGMET test focal point as given in 3.4.3 so that they can be excluded from the analysis.

3.2 Procedures for WS SIGMET tests

Note that the WS SIGMET is initiated by the MWO at the designated time in 3.2.2. It is not initiated by an advisory as in the WC and WV SIGMET tests.

Participating units:

3.2.1 Regional OPMET Data Banks (RODB):

Bangkok
Brisbane
Nadi
Singapore
Tokyo

3.2.2 Meteorological Watch Offices (MWO):

All MWOs listed in FASID Table MET 1B of ASIA/PAC Basic ANP and FASID (Doc 9673).

Notes: 2) FASID Tables MET 1B is reproduced in the Regional SIGMET Guide: http://www.bangkok.icao.int/edocs/sigmet_guide4.pdf

3.2.3 WS SIGMET Test Message

3.2.3.1 The MWOs should issue a TEST SIGMET during the 10-minute period between **0200 and 0210 UTC** (if not otherwise advised by the Regional Office) on the date agreed for the test.

3.2.3.2 The WMO heading and the first line of the SIGMET bulletin should be valid ones, while the body of the message should contain an explanatory text on the tests as shown on pages J-7 and J-8. The period of validity of the TEST SIGMET should be very short, e.g., 10 minutes.

3.2.4 Special procedure to avoid overwriting of a valid SIGMET

3.2.4.1 It is vital to ensure that TEST SIGMET is unique so that it is not confused with operational SIGMET and avoid overwriting a valid operational SIGMET in an automated system. In order to prevent this it is suggested that:

The SIGMET sequence number should be Z99.

For example, a SIGMET test is scheduled for 0200 UTC on the 29th. The TEST SIGMET is issued as follows:

```
WSAU01 YBRF 290200
YBBB SIGMET Z99 VALID 290200/290210 YBRF-
TEST SIGMET PLEASE DISREGARD=
```

If a test SIGMET is not issued due to active SIGMET, please notify the SIGMET tests focal points below and the ICAO Regional Office, Bangkok

3.3 Common procedures

3.3.1 The test date and time

3.3.1.1 ICAO Regional Office will set a date and time for each SIGMET test after consultation with the participating VAACs, TCACs and RODBs. The information about the agreed date and time will be sent to all States concerned by a State letter and copied to the States' SIGMET Tests Focal Points.

3.3.1.2 Tests for different types of SIGMET should preferably be conducted on separate dates.

3.3.1.3 SIGMET tests for WC, WV and WS should be conducted at least yearly.

3.3.2 Dissemination of test SIGMETs and advisories

3.3.2.1 All TEST SIGMETs and TC/VA advisories should be sent to the five ASIA/PAC RODBs. The AFTN addresses to be used by the MWOs, TCACs and VAACs are as follows:

Bangkok	VTBBYPYX
Brisbane	YBBBYPYX
Nadi	NFZZRFXX
Singapore	WSZZYPYM
Tokyo	RJTDYPYX

Note: To avoid duplicate advisories being counted in the TC and VA SIGMET test analysis, only FK and FV messages received by AFTN (not GTS and WAFS) are counted in the analysis.

3.3.2.2 RODB/IROG Singapore will relay the test bulletins to the corresponding IROG in the European Region where additional monitoring of those bulletins will be performed.

3.3.2.3 SIGMET tests should be terminated within 2 hours of the test start time (from 0200 to 0400 UTC).

3.3.3 Coordination with the ATS units

3.3.3.1 MWOs should inform the associated ATS units of the forthcoming SIGMET tests by a suitable advanced notice.

3.4 **Processing of the test messages and results**

3.4.1 The RODBs should file all incoming TEST advisories and SIGMETs and perform an analysis of the availability, timeliness of arrival and the correctness of the WMO bulletin headings. A SIGMET TEST Summary Table, as shown on page J-10, should be prepared by each RODB and sent to the SIGMET test focal point given in section 3.4.3, with a copy to the ICAO Bangkok Regional Office.

3.4.2 The SIGMET test focal points should prepare the final report of the test and present to the Regional Office. A summary report should be submitted to the next CNS/MET Sub-group meeting.

3.4.3 The current SIGMET test focal points for sending Summary Tables are as follows:

WS SIGMET summary table sent to:

Ms. Chua Guat Mui

Principal Technical Officer

Meteorological Services Singapore

P.O. Box 8, Singapore Changi Airport Post Office

SINGAPORE 918141

Tel: +65 (3) 6542 2861

Fax: +65 (3) 6542 2915

e-mail: chua_guat_mui@nea.gov.sg

WV/WC SIGMET summary table sent to:

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ALL Summary Tables and any enquires about SIGMET tests sent to:

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ASIA/PAC SIGMET TEST PROCEDURES

Format of TEST advisories and SIGMETs

1. Format of TEST Volcanic Ash Advisory

VA ADVISORY

DTG: YYYYYMMDD/0200Z
 VAAC: (name of VAAC)
 VOLCANO: TEST
 PSN: UNKNOWN
 AREA: (name of VAAC) VAAC AREA
 SUMMIT ELEV: UNKNOWN
 ADVISORY NR: YYYYY/nn
 INFO SOURCE: NIL
 AVIATION COLOUR CODE: NIL
 ERUPTION DETAILS: NIL
 OBS VA DTG: DD/0150Z
 OBS VA CLD: ASH NOT IDENTIFIABLE FROM SATELLITE DATA
 FCST VA CLD +6 HR: DD/0800Z SFC/FL600 NO ASH EXP
 FCST VA CLD +12 HR: DD/1400Z SFC/FL600 NO ASH EXP
 FCST VA CLD +18 HR: DD/2000Z SFC/FL600 NO ASH EXP
 RMK: THIS IS A TEST VA ADVISORY. MWO SHOULD NOW ISSUE A TEST SIGMET FOR VA,
 UNLESS THERE IS A VALID SIGMET FOR VA.
 PLEASE REFER TO THE LETTER FROM ICAO APAC OFFICE DATED xxxxxxxxxx.
 NXT ADVISORY: NO FURTHER ADVISORIES=

2. Format of TEST Tropical Cyclone Advisory

TC ADVISORY

DTG: YYYYYMMDD/0200Z
 TCAC: (name of TCAC)
 TC: TEST
 NR: nn (actual number)
 PSN: NIL
 MOV: NIL
 C: NIL
 MAX WIND: NIL
 FCST PSN +06HR: NIL
 FCST MAX WIND +06HR: NIL
 FCST PSN +12HR: NIL
 FCST MAX WIND +12HR: NIL
 FCST PSN +18HR: NIL
 FCST MAX WIND +18HR: NIL
 FCST PSN +24HR: NIL
 FCST MAX WIND +24HR: NIL

RMK: THIS IS A TEST TC ADVISORY. MWO SHOULD NOW ISSUE A TEST SIGMET FOR TC,
UNLESS THERE IS A VAILD SIGMET FOR TC.
PLEASE REFER TO THE LETTER FROM ICAO APAC OFFICE DATED xxxxxxxxxx.
NXT MSG: NIL=

3. **Format of TEST SIGMET for Volcanic Ash**

WVXXii CCCC YYGGgg
CCCC SIGMET n(nn) VALID YYGGgg/YYGGgg CCCC–
THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NUMBER xx RECEIVED AT YYGGggZ=

Example:

WVJP31 RJTD 170205
RJJ SIGMET 1 VALID 170205/170215 RJTD-
THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NUMBER 1 RECEIVED AT 170200Z=

4. **Format of TEST SIGMET for Tropical Cyclone**

WCXXii CCCC YYGGgg
CCCC SIGMET n(nn) VALID YYGGgg/YYGGgg CCCC–
THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TC ADVISORY NUMBER xx RECEIVED AT YYGGggZ=

Example:

WCJP31 RJTD 100205
RJJ SIGMET 1 VALID 100205/100215 RJTD-
THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TCADVISORY NUMBER 1 RECEIVER AT 180200Z=

5. **Format of TEST SIGMET for other weather phenomena**

WSXXii CCCC YYGGgg
CCCC SIGMET n(nn) VALID YYGGgg/YYGGgg CCCC–
THIS IS A TEST SIGMET, PLEASE DISREGARD=

Example:

WSJP31 RJTD 240205
RJJ SIGMET 1 VALID 240205/240215 RJTD-
THIS IS A TEST SIGMET, PLEASE DISREGARD=

Note: “xx” in the WMO heading to be used replaced by the respective WMO geographical designator

2) Actual SIGMET number to be used in all TEST SIGMETs

Sample Table to used by RODBs

Name of RODB Tokyo
 Date of Test 2011/11/17
 Target (VA or TC) VA

VA Advisories (FV)

<i>TTAAii</i>	<i>CCCC</i>	<i>YYGGgg</i>	<i>Received Time(UTC)</i>	<i>Comments/Remarks</i>
FVAK23	PAWU	170159	01:59:29	
FVAU01	ADRM	170201	02:01:53	
FVFE01	RJTD	170200	02:00:09	
FVPS01	NZKL	170207	02:08:27	
FVXX02	LFPW	170202	02:02:41	
FVXX25	KNES	170200	02:02:01	

VA SIGMET (WV)

<i>TTAAii</i>	<i>CCCC</i>	<i>YYGGgg</i>	<i>MWO</i>	<i>FIR</i>	<i>Received Time(UTC)</i>	<i>Comments/Remarks</i>
WVAK01	PAWU	170200	PAWU	PAZA	02:00:11	
WVAU01	ADRM	170201	YDRM	YBBB	02:02:04	
WVCI31	RCTP	170205	RCTP	RCAA	02:04:58	
WVCI33	ZBAA	170205	ZBAA	ZBPE	02:05:26	
WVCI34	ZSSS	170205	ZSSS	ZSHA	02:02:34	
WVCI35	ZJHK	170201	ZJHK	ZJSA	02:03:34	
WVCI36	ZUUU	170205	ZUUU	ZPKM	02:11:04	
WVCI37	ZLXY	170205	ZLXY	ZLHW	02:07:44	
WVCI38	ZYTX	170205	ZYTX	ZYSH	02:01:50	
WVCI39	ZWWW	170202	ZWWW	ZWUQ	02:02:40	
WVCI45	ZHHH	170204	ZHHH	ZHWH	02:08:52	
WVJ01	NFFN	170000	NFFN	NFFF	02:15:46	
WVIN31	VOMM	170201	VOMM	VOMF	02:09:57	
WVJP31	RJTD	170205	RJTD	RJJJ	02:06:24	
WVKP31	ZUUU	170206	ZUUU	VDPP	02:12:23	
WVLA31	VLVT	170200	VLVT	VLVT	02:01:03	
WVMS31	WMKK	170205	WMKK	WBFC	02:04:28	
WVPA01	PHFO	170201	PHFO	KZAK	02:02:09	
WVPH31	RPLL	170210	RPLL	RPHI	02:08:43	
WVPN01	KKCI	170200	KKCI	KZAK	02:00:11	
WVRA31	RUCH	170205	RUCH	UIAA	02:08:01	
WVRA31	RUHB	170206	RUHB	UHHH	02:07:57	
WVRA31	RUMG	170205	RUMG	UHMM	02:08:59	
WVRA31	RUPV	170200	RUPV	UHMP	02:09:13	
WVRA31	RUSH	170205	RUSH	UHSS	02:04:22	
WVRA31	RUVV	170202	RUVV	UHWW	02:03:13	
WVRA32	RUPV	170200	RUPV	UHMA	02:06:01	
WVRA32	RUYK	170207	RUYK	UELL	02:07:28	
WVRA33	RUHB	170202	RUHB	UHBB	02:02:49	
WVSR20	WSSS	170205	WSSS	WSJC	02:05:38	
WVSS20	VHHH	170202	VHHH	VHKK	02:03:05	
WVTH31	VTBS	170211	VTBS	VTBB	02:13:53	
WVVS31	VVGL	170200	VVGL	VVNB	02:05:06	
WVVS31	VVGL	170208	VVGL	VVTS	02:14:38	

— END —