CNS/MET SG/9 -WP/24
(Revised)
(MET)

International Civil Aviation Organization

NINTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP OF APANPIRG (CNS/MET SG/9)

Bangkok, Thailand, 11–15 July 2005

Agenda Item 10: ICAO Warning Systems

MATTERS RELATED TO SIGMET IMPLEMENTATION

(Presented by Secretariat)

SUMMARY

The paper discusses some issues related to SIGMET formats and procedures, as raised by States. Amendments to the ASIA/PACIFIC Regional SIGMET Guide are also presented for consideration by the meeting.

1. INTRODUCTION

1.1 Improving the implementation of the SIGMET service by the States has been a priority task pursued by the CNS/MET SG during the last few years. Though some progress has been achieved, the issuance of SIGMET is still one of the main MET deficiencies identified by APANPIRG.

1.2 To assist States, ICAO issued a new version of the *ASIA/PACIFIC Regional SIGMET Guide* in September 2003. It was agreed that, in order to be an useful guidance material, the Guide should be kept up-to-date with the relevant ICAO documents and the regional developments. In view of this, the Secretariat prepared an amended version to reflect changes invoked by Amendment 73 of Annex 3, which became applicable in November 2004, as well as other necessary changes since September 2003.

1.3 Some issues related to the SIGMET format and procedures have been raised by the States, based on their operational experience. The Secretariat provided advice to these queries accordingly. It has been identified that some of these issues were of general interest, therefore they are presented below for discussion by CNS/MET SG.

1.4 Two regional SIGMET tests were held in the beginning of 2005 by the VA/TC Implementation TF in coordination with the Regional Office, in order to check the communication procedures for dissemination of VA and TC advisories and SIGMETs. The results of these tests and the plans for future tests are also discussed in brief.

2. DISCUSSION

2.1 The updated version of the ASIA/PACIFIC Regional SIGMET Guide is presented in Attachment A. The main changes are related to:

- the restructuring of Annex 3 by Amendment 73;
- introduction of the location indicator of the FIR in the beginning of the SIGMET body;
- necessary editorial changes;
- updating the Appendices and related tables;
- new Appendix for the WMO abbreviated headings of the SIGMET bulletins;
- new Appendix for the WMO abbreviated headings of the advisory bulletins.

2.2 SIGMET format and procedures

2.2.1 It is recalled that APANPIRG Conclusion 14/37, Amendments of SIGMET format, invited ICAO to consider amendments to SIGMET format specified in Annex 3, in particular the part of the SIGMET message related to the geographical location of the meteorological phenomenon.

2.2.2 The conclusion was noted by the Air Navigation Commission at its 165th Session and the task to review the proposed amendments was assigned to the METLINK Study Group. METLINKSG at its 8th meeting reviewed the proposals by APANPIRG and concluded that some of them had already been incorporated in Amendment 73, while others were incorporated in a draft proposal for Amendment 74 to Annex 3. Details can be found in the METLNKSG/8 Report at: http://www.icao.int/anb/sg/metlinksg/. The draft amendment prepared by METLINKSG/8 related to SIGMET is reproduced in Attachment B to this paper.

2.2.3 Other issues raised the States, which may be of general interest are as follows:

2.2.3.1 Need to clarify the provisions for updating SIGMET; for VA and TC SIGMET it is specified that update should be made at least every 6 hours. However, for “normal” SIGMETs there is no provision on updating requirements. This includes the case when a SIGMET issued for a “FCST” phenomenon should be eventually replaced by a SIGMET for “OBS” phenomenon.

2.2.3.2 How to handle “forecast” SIGMET in relation to VOLMET (and D-VOLMET). It is logical that SIGMET should be reported by VOLMET only during its period of validity. Thus, SIGMETs issued in advance should not be included in VOLMET until the commencement of their period of validity. In this regarded it may be proposed to replace in Annex 3, App. 10, 4.2.1, the word “available” with “valid”. Same applies for the OUTLOOK part of the VA and TC SIGMETs, which may need to be cut off when SIGMET is used for VOLMET.

2.2.3.3 Issuance of SIGMET when the FIR concerned is affected by part of a tropical cyclone (e.g., the FIR is affected by one of the tropical cyclone cloud spirals). The question here is should the SIGMET be issued as SIGMET for tropical cyclone (WC SIGMET), or as SIGMET for thunderstorms (WS SIGMET). It should be noted in this regard, that the current format of WC

SIGMET, as defined in Annex 3, App. 6, Table A6-1, assumes that the TC (as a weather phenomenon) is described as a circle-shaped cloud system, e.g., "CB TOP FL500 WI 150 NM OF CENTRE". Difficulties arise when the centre of the TC is outside the FIR, but it is affected by part of the TC cloud system. It may be useful to impose some more detailed criteria in this regard, for instance:

- the MWO should issue a WC SIGMET when the TC centre is (or is expected to be) within the FIR concerned;
- otherwise, when the larger part of the TC lies outside, but the FIR is affected by one of the TC cloud spirals or other cloud formation which is part of the TC cloud system, so that the weather phenomenon actually affecting the flight safety is a TS formation, the MWO should issue a WS SIGMET for TS.

In case that such provisions are introduced, it might be useful to have a remark (RMK) section in the SIGMET message to provide additional explanation on the reported/forecasted phenomenon.

2.2.3.4 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 reporting of multiple phenomena or areas in one message; the MWO should issue separate SIGMETs in such a case. There are two main concerns with issuing separate SIGMETs, as follows:

- It is possible that a new SIGMET for the same FIR would replace a previous and still valid one. 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". This explanation has been added to the Regional SIGMET Guide.
- Multiple valid SIGMETs in the FIR could have negative operational implications since the ACCs are required to report SIGMET to aircraft in flight; also, too lengthy the VOLMET broadcasts.

2.2.3.5 It is desirable to add more examples in Table A6-1 describing some "difficult" cases, such as, how to use the "geographical features well known internationally" for the location of the phenomenon.

2.2.3.6 The usefulness of "OBS AND FCST" is questionable. Each SIGMET may contain some forecast part when indicating the movement and intensity change. Therefore, it would be clearer for the user to use either "OBS" or FCST" to indicate existence or expectation of the phenomenon concerned.

2.2.4 It is expected that the meeting will discuss the above issues and develop a proposal on the agreed items to be considered for inclusion in the next Amendment(s) to Annex 3.

2.2.5 SIGMET tests

2.2.5.1 The results of the tests are presented in detail in a separate paper. It is appreciated that many States in the region participated in these exercises. The tests revealed some important shortcomings in the procedures for issuance and dissemination of SIGMET in the region. That is why, it is considered necessary to continue with the tests for all type of SIGMET on a regular basis.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information provided in this paper;
b) discuss necessary amendments of the SIGMET format and procedures;
c) formulate draft conclusion(s) accordingly, to allow consideration of the proposed amendments for inclusion in the next Amendment (s) to Annex 3.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA/PACIFIC REGIONAL SIGMET GUIDE

THIRD EDITION — SEPTEMBER 2003

RECORD OF AMENDMENTS AND CORRIGENDA

Amendments			
No.	Date of issue	Date entered	Entered by

Corrigenda			
No.	Date of issue	Date entered	Entered by

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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, 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 regulatory material concerning the provision of SIGMET information is contained in:

- Annex 3 - Meteorological Service for International Air Navigation, Part I, Chapter 3, ~~para~~ 3.~~5~~ 4 – 3.7, Chapter 7, ~~para~~ 7.1~~ – 7.2~~, and Part II, Appendix 6~~5~~;~~.~~
- ASIA/PAC Basic ANP, Part VI~~, para 6~~, and ASIA/PAC FASID Table MET 1B and MET 2B;
- Annex 11 - Air Traffic Services, Chapter 4, ~~para~~ 4.2.1 and Chapter 7, ~~para~~ 7.1;
- PANS – Air Traffic Management, Doc 4444, Chapter 9, ~~para~~ 9.1.3.2;
- Regional Supplementary Procedures, Doc 7030, Part 1, ~~para~~ 11.2.

Additional guidance on the SIGMET procedures is contained in Manual of Aeronautical Meteorological Practice, Doc 8896, and 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 messages. It provides detailed information on the format of SIGMET messages as specified by Annex 3. The explanations of the format are accompanied by a number of 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 ~~shall~~should be reviewed and updated regularly in order to be kept in line with the relevant ICAO documents and regional procedures.

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PART 2. RESPONSIBILITIES AND COORDINATION

2.1 General

1.1.1 ~~2.1.1~~ SIGMET is a warning information and hence it is of highest priority. SIGMET is used mainly for in-flight service, which requires timely transmission of the SIGMET information to pilots by the ATS units and/or through VOLMET and D-VOLMET. One of the most valuable sources of information in preparation of SIGMETs is provided through the special air-reports transmitted by pilots to the ATS units and forwarded to MWOs. As it is seen, the SIGMET service involves MET, ATS and pilots, that is why, close coordination between them, as well as mutual understanding of the needs and responsibilities, is essential for successful implementation of the SIGMET service.

1.1.2 SIGMET is also used for flight planning purposes, therefore, it should be disseminated to the international OPMET data banks and the providers of 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 forecasts for significant weather (SIGWX).

2.1.~~2~~3 In the next paragraphs, the main responsibilities and coordination links between MET, ATS and pilots are described.

2.2 Meteorological Watch Office - responsibilities and procedures related to SIGMET

1.1.1 ~~2.2.1~~ SIGMET information ~~shall~~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, which may affect the safety of the flight operations in the MWO's area of responsibility (AOR). SIGMET ~~shall~~should provide information concerning the location, extent, intensity and expected evolution of the specified phenomena.

1.1.2 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.~~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.~~3~~4 If, for some reason, a State ~~MWO~~ is not able to meet its obligations for establishing MWO(s) and for ~~including the~~ provision of SIGMET, arrangements ~~shall~~should be made between the meteorological authorities concerned, that another MWO takes over these responsibilities for certain period of time. Such delegation of responsibilities ~~shall~~should be notified by a NOTAM and a letter to the ICAO Regional Office.

2.2.~~4~~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 ~~shall~~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.~~5~~6 In preparing SIGMET information the MWOs ~~shall~~should follow strictly the format determined by Annex 3. SIGMET ~~shall~~should be issued only for those weather phenomena listed in Annex 3 and only when specified criteria for intensity and spatial extent are met.

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

2.2.~~6~~7 The MWOs ~~shall~~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 meteorological authority concerned ~~shall~~should determine to what extent the MWO makes use of the WAFS products, as well as other sources of information, such as special air-reports, information from meteorological satellites or weather radars.

2.2.~~7~~8 On receipt of a special air-report from the associated ACC or FIC, the MWO ~~shall~~should :

~~a)~~) issue corresponding SIGMET information; or

b) decide that the issuance of SIGMET information is not warranted and to so inform the ACC/FIC (e.g., the phenomenon concerned is of transient nature).

2.2.~~8~~9 Appropriate telecommunication means ~~shall~~should be available at the MWO in order to ensure timely dissemination of SIGMETs according to a dissemination scheme, which should include transmission to:

~~1.~~ Local ATS users;

~~3.~~ Aeronautical MET offices within its AOR, where SIGMET is required for briefing and/or flight documentation;

~~4.~~ Other MWOs concerned (it should be ensured that SIGMETs are sent to all MWOs whose AORs are, at least partly, within the 1800 km (1000 NM) range from the observed phenomenon);

~~5.~~ Centres designated for transmission of VOLMET or D-VOLMET where SIGMET is required for those transmissions;

~~6.~~ 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);

~~7.~~ Responsible TCAC or VAAC (if applicable).

2.2.~~9~~10 In issuing SIGMETs for tropical cyclones or volcanic ash, the MWOs ~~shall~~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 ~~shall~~should be established between the MWO and the corresponding ATS unit (ACC or FIC). Arrangements ~~shall~~should be made in order to ensure:

- receipt without delay and display at the relevant ATS units of SIGMETs 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. 2.4.3 below, (within 1800 km (1000 NM) range from the observed phenomenon); and

- transmission without delay of special air-reports received through voice communication to the associated MWO.

2.3.2 SIGMET information ~~shall~~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 ~~shall~~should cover a portion of the route up to two hours flying time ahead of the aircraft. SIGMETs ~~shall~~should be transmitted only during the time corresponding to their period of validity (p. 3.4.2.3 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 ~~shall~~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 ~~shall~~should also transmit to aircrafts-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 ~~shall~~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. That is why, SIGMETs for volcanic ash and tropical cyclones contain an outlook part, which goes 12 hours beyond the validity period of the “normal” SIGMET. For the same reason, the requirement for dissemination of SIGMETs for tropical cyclone and volcanic ash goes beyond the two hours flying time to cover the whole route to be flown.

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, a number of Volcanic Ash Advisory Centres (VAAC) and Tropical Cyclone Advisory Centres (TCAC) have been designated in order to assist MWOs in the preparation of the outlook part of the SIGMETs for those phenomena. Close coordination ~~shall~~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 to which advisories are to be sent is provided in FASID Tables MET 3A and MET 3B of 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. Thus they can be used directly by the operators during the preflight planning. Notwithstanding, it should be emphasized that SIGMET information is still of higher operational status and 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 existence of volcanic ash cloud or tropical cyclone.

PART 3. RULES 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~~1.1.1 In contrast to other MET messages, like aerodrome reports and forecasts, for which WMO codes (METAR and TAF) have been developed, SIGMET looks less formalized and allowing more freedom to the forecaster. However, the increasing use of automated systems for handling the MET information by ~~the MET offices and~~ the aviation users, makes it essential that all types of OPMET information, including SIGMET, are prepared and transmitted in the prescribed standardized formats. Therefore, ~~Amendment 72 to Annex 3, which became applicable in November 2001, provided a well defined~~ the structure and format of the SIGMET message, ~~that shall be followed strictly by the MWOs.~~ as specified in ~~Appendix 5 to~~ 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~~1.1.2 It should be remembered that SIGMET is intended for transmission to aircraft in flight either by ATC or by VOLMET or D-VOLMET. Therefore, SIGMET messages should be kept short and clear, without additional descriptive material other than that prescribed by Annex 3.

~~3.1.4~~1.1.3 After issuing a SIGMET the MWO ~~shall~~should follow the evolution of the phenomenon for which the SIGMET has been issued and issue a new updated SIGMET when necessary. The TC and VA SIGMETs ~~shall~~should be updated at least every 6 hours.

~~3.1.5~~1.1.4 SIGMETs ~~shall~~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.

3.2 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 and SS);
- SIGMET for volcanic ash, which will be hereafter denoted as VA SIGMET;
- SIGMET for tropical cyclones, which will hereafter be denoted as TC 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 relevant ATS unit and MWO, sequential number and period of validity;
- *Meteorological part*, containing meteorological information concerning the phenomenon for which the SIGMET is issued;
- *Outlook part* – forecast part to be included only in SIGMETs for volcanic ash and tropical cyclones.

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

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 the real SIGMETs accepts concrete numerical values.

3.4.1 WMO Header

$T_1T_2A_1A_2$ii CCCC YYGGgg [CCx]

3.4.1.1 The group **$T_1T_2A_1A_2$ii** is the bulletin identification for the SIGMET message. It is constructed in the following way:

T_1T_2	Data type designator	**WS** – for SIGMET **WC** – for SIGMET for tropical cyclone **WV** – for SIGMET for volcanic ash
A_1A_2	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).

3.4.1.3 **YYGGgg** is the date/time group, where YY is the date and GGgg is the time in hours and minutes UTC, of the transmission of the SIGMET (normally this is the time assigned by the AFTN center which disseminates the message).

3.4.1.4 The group **CCx** ~~shall~~should be used only when sending a correction of a SIGMET, which has already been transmitted; the third letter "x" takes the value A for the first correction, B for the second correction, etc. In this, the MWOs ~~shall~~should try to minimize the corrections of the SIGMETs, taking into account their importance to the flight planning including in-flight re-planning.

Examples:

WSTH31 VTBD 121200
WVJP01 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 (SIGMET SST)	Message identifier; SIGMET SST is used for SIGMETs containing information for supersonic aircraft during transonic or supersonic flight
[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 MWO originating the message
-	**hyphen** to separate the preamble from the text

3.4.2.2 The numbering of SIGMETs ~~shall~~should start every day at 0001 UTC. The sequence number ~~shall~~should consists of up to three symbols and may be a combination of letters and numbers, like:

- 1, 2, …
- 01, 02, …
- A01, A02, …

Examples:

RPMM SIGMET 3 VALID 121100/121700 RPLL-
RJTG SIGMET A04 VALID 202230/210430 RJAA-

Note 1: No other combinations ~~shall~~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 SIGMET should be not more than 6 hours and preferably not more than 4 hours;
- In case of a SIGMET for an observed phenomenon the filing time (date/time group in the WMO header) ~~shall~~should be same or close to the date/time group indicating the start of the SIGMET validity period;
- When the SIGMET is for an expected phenomenon, the beginning of validity period is the time of expected commencement (occurrence) of the phenomenon;
- In case of a SIGMET for an expected phenomenon, the lead time (the time of issuance of the SIGMET) should be not more than 6, and preferably not more than 4 hours before the start of validity period (i.e., expected time of occurrence of the phenomenon); for TC and VA SIGMETs 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 VTBD 241120
   VTBD SIGMET 3 VALID 241120/241500 VTBD-

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

   WSSG31 WSSS 311130
   WSSS SIGMET 1 VALID 1530/1930 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 SIGWX 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 <GGggZ>] FCST OBS [AT <GGggZ>] AND FCST	Geographical location of the phenomenon given by coordinates, or geographical objects, or location indicators	FL<nnn> FL<nnn/nnn> [TOP, ABV, BLW]

6	7
Movement or expected movement	Changes in intensity
MOV <direction, speed>, 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 is given followed by the appropriate abbreviation: FIR, FIR/UIR or CTA.

Examples:

VTBD BANGKOK FIR

3.4.3.1.2 Phenomenon

The phenomenon description consists of a qualifier and a phenomenon abbreviation. SIGMET ~~shall~~should be issued only for the following phenomena:

A) for subsonic cruising levels:

- 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

B) for transonic and supersonic levels:

- cumulonimbus – if they are ISOL, OCNL or FRQ
- hail
- turbulence – MOD or SEV

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 <GGggZ>]
or FCST
or OBS [AT <GGggZ>] AND FCST

The indication whether the information is observed or forecast is given by the abbreviations OBS and FCST. OBS is optionally followed by a 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, it is assumed that the time of occurrence or commencement of the phenomenon coincides with the beginning of the period of validity included in the first line of the SIGMET. Finally, the combination OBS AND FCST indicates that the phenomenon is observed and expected to continue.

Examples:

OBS AT 0140Z
OBS AT 1030Z AND FCST
FCST

3.4.3.1.4 Location of the phenomenon

The location of the phenomenon is given with reference to geographical coordinates or with reference to geographical features well known internationally. The MWOs ~~shall~~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 perceived.

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;
- 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 ~~5~~ 6 to Annex 3 and in Appendix F to this Guide.

3.4.3.1.5 Vertical extent or level

FL<nnn>
or FL<nnn/nnn>
or TOP FL<nnn>
or [TOP] ABV FL<nnn>
or [TOP] BLW FL<nnn>

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

- reporting of 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 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 … BLW FL150
SEV MTW … FL090

3.4.3.1.6 Movement

MOV <direction> <speed>
or
STNR

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

Examples:

MOV NW 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
		Name	Location	
	VA	[ERUPTION] [MT <name>]	[LOC <location>]	VA CLD OBS AT <GGggZ>

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

6	
Volcanic ash cloud forecast at the end of the period of validity	
FCST time	Position
FCST <GGggZ>	VA CLD APRX [FL<nnn/nnn>] <lat,lon> - <lat,lon> - …

Start of the outlook line of the message

7	8	
Outlook	Volcanic ash cloud trajectory	
	Date/time	Position
OTLK	<YYGGggZ>	VA CLD APRX <lat,lon> - <lat,lon> - …

9	
Volcanic ash cloud trajectory	
Date/time	Position
<YYGGggZ>	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>] [LOC <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 RABAUL**
  ii. location of the volcano is given by the abbreviation **LOC** – location, followed by the latitude and longitude in degrees and minutes;
  e.g., **LOC 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** ~~shall~~should be included in the SIGMET.

3.4.4.3 Time of observation or expected commencement of the VA CLD

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

The time of observation is taken from the source of the observation – satellite image, special air- report, report from a ground 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 affecting the FIR

after certain time, SIGMET ~~shall~~should ~~–~~be issued, according to paragraph 2.4 above, and the abbreviation VA CLD FCST ~~shall~~should be used.

Examples:

VA CLD OBS AT 0100Z
VA CLD FCST

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]	Approximate horizontal extent of the VA cloud in KM or NM
<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 ~~shall~~should be separated by hyphen

If the VA cloud spreads over more than one FIR, separate SIGMETs ~~shall~~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 ~~shall~~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>
or
STNR

The direction of movement is given by the abbreviation **MOV** – moving, followed by one of the eight points of compass: N, NE, E, SE, S, SW, W, NW. The speed of movement is given in KMH or KT.

Examples:

MOV E 35 KMH
MOV SW 20 KT
STNR

[1] The format of geographical coordinates reporting in SIGMET is given in Appendix E.

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

FCST <GGggZ> VA CLD <P1(lat,lon) - P2(lat,lon) - … >

The **GGggZ** group ~~shall~~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 Outlook providing information beyond the period of validity of the trajectory of the volcanic ash cloud

OTLK <YYGGgg>$_{+6}$ VA CLD APRX [FLnnn/nnn] <P1(lat,lon) - P2(lat,lon) - … >
[[FLnnn/nnn] <P1(lat,lon) - P2(lat,lon) - … >] …
<YYGGgg>$_{+12}$ VA CLD APRX [FLnnn/nnn] <P1(lat,lon) - P2(lat,lon) - … >
[[FLnnn/nnn] <P1(lat,lon) - P2(lat,lon) - … >] …

~~3.4.4.7.1~~1.1.1.1.1 The abbreviation **OTLK** indicates the start of the outlook part of the SIGMET. It consists of two sub-parts, each providing description of the approximate position of the volcanic ash cloud at 6 and 12 hours after the end of the period of validity of the SIGMET. Each sub-part begins with a date/time group **<YYGGgg>$_{+6}$** and **<YYGGgg>$_{+12}$** indicating the date and time of the +6 and +12 forecast respectively. The expected approximate position of the VA cloud is given by the geographical coordinates of a number of points P1, P2, etc.

Note: Together with the OUTLOOK the VA SIGMET includes up to 3 forecasts of the position of the volcanic ash cloud: +6 hour position is given in the FCST part of the SIGMET itself, and the OUTLOOK provides +12 and +18 hour position forecasts, based on the VA advisory received from the responsible VAAC.

3.4.4.7.2 In describing the VA cloud up to four different layers can be used, indicated by flight levels in the form FL<nnn/nnn>. The use of more than one level is necessary when the wind direction distribution with height determines that the cloud is spread horizontally into different directions at different height layers.

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		Extent
		Location	Time	
	TC <name>	OBS <…>	AT <GGggZ>	CB TOP FL<nnn> WI <nnn>KM OF CENTRE

5	6	7
Expected movement	Intensity change	Forecast of the centre position at the end of the validity period
MOV <dir> <speed>	INTSF or WKN or NC	FCST <GGggZ> TC CENTRE < … >

Start of the outlook line of the message

8	9		10	
Outlook	Position of the centre		Position of the centre	
	Date/time	Location	Date/time	Location
OTLK	<YYGGggZ>	TC CENTRE < … >	<YYGGggZ>	TC CENTRE < … >

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.

Examples:

TC GLORIA
TC 04B

3.4.5.3 Time of observation

OBS AT <GGggZ>

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.

Examples:

OBS AT 2330

3.4.5.4 Location of the TC centre

TC CENTRE <location>

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

Examples:

TC CENTRE 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>
or
STNR

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

Examples:

MOV NW 30KMH
MOV E 25KT

~~3.4.5.7~~1.1.1.1 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 <GGggZ> 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

3.4.5.9 Outlook providing information of positions of the TC centre beyond the period of validity of the SIGMET

OTLK <YYGGgg>$_{+6}$ TC CENTRE <location> <YYGGgg>$_{+12}$ TC CENTRE <location>

The outlook provides information of the expected positions of the TC centre beyond the validity period of the SIGMET indicated in the first line of the SIGMET message. Normally, the outlook ~~shall~~should include "end of validity +6 hours" and "end of validity +12 hours" information based on the TC advisory issued by the responsible TCAC.

Note: Together with the OUTLOOK the TC SIGMET includes up to 3 forecasts of the position of the TC centre: +6 hour position is given in the FCST part of the SIGMET itself, and the OUTLOOK provides +12 and +18 hour position forecasts, based on the TC advisory received from the responsible TCAC.

Examples:

OTLK 081900 TC CENTRE S1230 E15500 090100 TC CENTRE S1200 E15630

~~3.4.~~6*1.1.1 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, this 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
- 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 SIGWX SIGMET with the following first line

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 13151500/132115 YUSO-
YUDD SHANLON FIR …

Cancellation SIGMET:

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

~~*Note: The above example is subject to final approval of the Amendment 73 of Annex 3.*~~

3.5 Communications

3.5.1 SIGMETs are 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 two segments – a ground-to-ground links segment, AFTN, and a satellite distribution segment which is composed by the SADIS and ISCS services provided by UK and USA respectively.

3.5.3 AFTN links ~~shall~~should be used by the MWOs to send their SIGMETs, in the following way:

– SIGMETs ~~shall~~should ~~–~~be sent to the adjacent MWOs and ACCs* using direct AFTN addressing;

– When required for VOLMET or D-VOLMET, SIGMETs ~~shall~~should be sent to the relevant ~~communication~~ centre providing the VOLMET service;

– SIGMETs ~~shall~~should be sent to the responsible ROBEX centre and forwarded without delay to the responsible regional OPMET Data Bank (RODB);

– It ~~shall~~should be arranged that through the ROBEX scheme SIGMETs are relayed to the SADIS and ISCS providers for satellite dissemination, as well as to WAFC London and Washington.

3.5.4 Through SADIS and ISCS, SIGMETs are disseminated to all users authorised and equipped to receive OPMET information via the satellite distribution. In this way, SIGMETs are available on global basis, meeting the aeronautical requirement.

~~3.5.5 The requirements for SIGMET exchange, as specified by the States, are given in FASID Table MET 2A – Exchange of SIGMET Messages.~~

* *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.*

———————

APPENDIX A

TABLE MET 1B - METEOROLOGICAL WATCH OFFICES

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
AUSTRALIA				MWOs have areas of responsibility (AOR) defined by specific forecast area boundaries. These boundaries are not aligned with FIR boundaries
ADELAIDE/Adelaide	YPRM	Melbourne FIR 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.	YMMM	
BRISBANE/Brisbane	YBRF	Brisbane FIR 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.	YBBB	
		Melbourne FIR limited by the coordinates: 26S/138E;29S/143E;29S/142E; 2806S/14012E;26S/138E.	YMMM	
DARWIN/Darwin	YDRM	Brisbane FIR 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.	YBBB	
		Melbourne FIR 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.	YMMM	

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
HOBART/Hobart	YMHF	Melbourne FIR limited by the coordinates: 40S/14045E;40S/143E; 3953S/14353E;4006S/14759E; 40S/150E;45S/150E; 45S/14045E;40S/14045E.	YMMM	
MELBOURNE/Melbourne	YMRF	Brisbane FIR limited by the coordinates: 3730S/15033E;3730S/163E; 45S/163E;45S/150E; 4434S/150E;4351S/15040E; 43S/151E;3811S/15019E; 3730S/15033E.	YBBB	
		Melbourne FIR 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.	YMMM	
PERTH/Perth	YPRF	Brisbane FIR limited by the coordinates: 12S/110E;12S/12320E; 1055S/12447E;14S/124E; 1345S/12609E;14S/12730E; 1450S/12825E;1528S/12806E; 16S/12915E;20S/129E; 2030S/12330E;2250S/12330E; 2153S/12226E; Thence along the major arc of a circle of 15 NM radius centred on 2143S 12213E; 2133S/12201E;2026S/12045E; Thence along the minor arc of a circle of 120NM radius centred on 2023S 11837E; 1823S/11825E;1753S/11822E; Thence along the minor arc of a circle of 150NM radius centred on 2023S 11837E; 1934S/11606E;1931S/11331E; 12S/110E.	YBBB	
		Melbourne FIR limited by the coordinates: 06S/75E;02S/78E;02S/92E;12S/107E;12S/110E;1931S/11331E;1934S/11606E; thence along the minor arc of a circle of 120NM radius centred on 2023S 11837E; 1753S/11822E;1823S/11825E; thence along the minor arc of a circle of 120NM radius centred on 2023S 11837E; 2026S/12045E;2133S/12201E; thence along major arc of a circle of 15.0NM radius centred on 2143S 12213E; 2153S/12225E;2250S/12330E; 25S/12330E;25S/12815E; 2715S/12830E;30S/129E; 30S/129E;33S/129E;45S/129E; 45S/75E;06S/75E.	YMMM	

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
SYDNEY/Sydney	YSRF	Brisbane FIR 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	YBBB	
		Melbourne FIR 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.	YMMM	
TOWNSVILLE	YBTL	Brisbane FIR 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.	YBBB	
BANGLADESH				
DHAKA/Zia Intl	VGZR	Dhaka FIR and SRR	VGFR	
CAMBODIA				
PHNOM-PENH/Pochentong	VDPP	Phnom-Penh FIR and SRR	VDPP	Not implemented
CHINA				
BEIJING/Capital	ZBAA	Beijing FIR and SRR	ZBPE	
GUANGZHOU/Baiyun	ZGGG	Guangzhou FIR and SRR	ZGZU	
KUNMING/Wujiaba	ZPPP	Kunming FIR and SRR	ZPKM	
LANZHOU/Chongchuan	ZLLL	Lanzhou FIR and SRR	ZLHW	
SHANGHAI/Hongqiao	ZSSS	Shanghai FIR and SRR	ZSHA	
SHENYANG/Taoxian	ZYTX	Shenyang FIR and SRR	ZYSH	
TAIBEI/Taibei Intl	RCTP	Taibei FIR and SRR	RCTP	
URUMQI/Diwopu	ZWWW	Urumqi FIR and SRR	ZWUQ	
WUHAN/Tianhe	ZHHH	Wuhan FIR and SRR	ZHWH	
HONG KONG/Hong Kong Intl	VHHH	Hong Kong FIR and SRR	VHHK	

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA				
PYONGYANG/Sunan	ZKPY	Pyongyang FIR and SRR	ZKKK	
FIJI				
NADI/Nadi Intl	NFFN	Nadi FIR and SRR	NFFF	
FRENCH POLYNESIA				
TAHITI/Faaa	NTAA	Tahiti FIR and SRR	NTTT	
~~**GUAM**~~				
~~GUAM I./Agana NAS~~	~~PGUM~~	~~Oakland Oceanic FIR West of 160E; Guam SRR~~	~~KZOA~~	
INDIA				
~~CALCUTTA/Calcutta~~KOLKATA/Kolkata	VECC	~~Calcutta~~ Kolkata FIR and SRR	VECF	
CHENNAI/Chennai	VOMM	Chennai FIR and SRR	VOMF	
DELHI/Indira Ghandi Intl	VIDP	Delhi FIR and SRR	VIDF	
MUMBAI/Jawaharlal Nehru Intl	VABB	Mumbai FIR and SRR	VABF	
INDONESIA				
~~BIAK/Frans Kaisieppo~~	~~WABB~~	~~Biak FIR and SRR~~	~~WABZ~~	
~~DENPASAR/Ngurah Rai (Bali Intl)~~	~~WRRR~~	~~Bali FIR and SRR~~	~~WRRZ~~	
JAKARTA/Soekarno-Hatta Intl	WIII	Jakarta FIR/UIR and SRR	WIIF~~WIIZ~~	
UJUNG PANDANG/Hasanuddin	WAAA	Ujung Pandang FIR/UIR and SRR	WAAF~~WAAZ~~	
JAPAN				
NAHA/Naha	ROAH	Naha FIR	RORG	
TOKYO/New Tokyo Intl	RJAA	Tokyo FIR/SRR	RJTG	
LAO PEOPLE'S DEMOCRATIC REPUBLIC				
VIENTIANE/Wattay	VLVT	Vientiane FIR and SRR	VLVT	
MALAYSIA				
KOTA KINABALU/Kota Kinabalu Intl	WBKK	Kota Kinabalu FIR and SRR	WBFC	
KUALA LUMPUR/Kuala Lumpur Intl	WMKK	Kuala Lumpur FIR and SRR	WMFC	
MALDIVES				
MALE/Hulule	VRMM	Male FIR and SRR	VRMM	

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
MONGOLIA				
ULAN BATOR/Ulan Bator	ZMUB	Ulan Bator FIR and SRR	ZMUB	
MYANMAR				
YANGON/Yangon Intl	VYYY	Yangon FIR and SRR	VYYY	
NAURU				
NAURU I./Nauru	ANAU	Nauru FIR and SRR	ANAU	
NEPAL				
KATHMANDU/Tribhuvan Intl	VNKT	Kathmandu FIR and SRR	VNSM	
NEW ZEALAND				
NEW ZEALAND/Wellington Kelburn ~~Intl~~[2]	NZKL~~NZWW~~	Auckland Oceanic FIR and SRR	NZZO	Operational monitoring coverage south of 60˚S is limited due to the lack of information
		New Zealand FIR AND SRR	NZZC	
NORTHERN MARIANA ISLANDS (United States)				
SAIPAN I. (OBYAN)/Saipan I.(Obyan) Intl	PGSN	Guam SRR		
PAKISTAN				
KARACHI/Quaid-E-Azam Intl	OPKC	Karachi FIR and SRR	OPKR	
LAHORE/Lahore	OPLA	Lahore FIR and SRR	OPLR	
PAPUA NEW GUINEA				
PORT MORESBY/Jacksons	AYPY	Port Moresby FIR and SRR	AYPY	
PHILIPPINES				
MANILA/Ninoy Aquino Intl	RPLL	Manila FIR and SRR	RPHI	
REPUBLIC OF KOREA				
INCHEON/Incheon Intl	RKSI	Incheon FIR and SRR~~Daegu FIR and SRR~~	RKRR	
SINGAPORE				
SINGAPORE/Singapore Changi	WSSS	Singapore FIR and SRR	WSJC	

[2] Operational monitoring coverage south of 60˚S is limited due to the lack of information

MWO location Emplacement du MWO Lugar de la OVM	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	Area served/Région desservie/Zona de servicio		Remarks Observations Observaciones
		Name/Nom/Nombre	ICAO location indicator Indicateur d'emplace-ment OACI Indicador de lugarde la OACI	
1	2	3	4	5
SOLOMON ISLANDS				
HONIARA/Henderson	AGGH	Honiara FIR and SRR	AGGG	
SRI LANKA				
COLOMBO/Katunayake	VCBI	Colombo FIR and SRR	VCBI	
THAILAND				
BANGKOK/Bangkok Intl	VTBD	Bangkok FIR and SRR	VTBB	
UNITED STATES				
ANCHORAGE/Anchorage Intl	PAWUPANC	Anchorage ~~Oceanic~~ FIR~~; portion of Anchorage Continental FIR South of a line between approximately 62N 141W and approximately 6230N 175W and West of a line between approximately 59N 13730W and approximately 5530N 145W; Juneau SRR.~~	PAZAPZAN	
~~FAIRBANKS/Fairbanks Intl~~	~~PAFA~~	~~Anchorage Arctic FIR; portion of Anchorage Continental FIR North of a line between approximately 62N 141W and approximately 6530N 175W; Honolulu SRR.~~	~~PZAN~~	
HONOLULU/Honolulu Intl	PHFOPHNL	Oakland Oceanic FIR South of 30N, East of 160E and West of 140W; Honolulu SRR.	KZOA	
~~(JUNEAU, Alaska)~~	~~PAJN~~	~~Portion of Anchorage Continental FIR East of a line between approximately 59N 13730W and approximately 5530N 145W.~~	~~PZAN~~	
(KANSAS CITY/Missouri) (National Aviation Weather Advisory Unit)	KMKC	Oakland Oceanic FIR North of 30N.	KZOA	
VIET NAM				
Gialam MWO	VVGL	Hanoi FIR and SRR Ho-Chi-Minh FIR and SRR	VVNB VVTS	

APPENDIX B

FASID TABLE MET 3A — TROPICAL CYCLONE ADVISORY CENTRES

EXPLANATION OF THE TABLE

Column

1. Location of the tropical cyclone advisory centre (TCAC).
2. Area of responsibility for the preparation of advisory information on tropical cyclones by the TCAC in Column 1.
3. Period of operation of the TCAC.
4. MWO to which the advisory information on tropical cyclones should be sent.

Note. — ICAO location indicators for MWOs are shown in FASID Table MET 1B.

TROPICAL CYCLONE ADVISORY CENTRE	AREA OF RESPONSIBILITY[1]	TROPICAL CYCLONE SEASON[2]	MWOs TO WHICH ADVISORY INFORMATION IS TO BE SENT
1	2	3	4
Miami (United States)	Eastern Pacific N: 60°N S: 0°N W: 140°W E: Coastline	May - November	Guam Honolulu Kansas City Miami Tahiti
Honolulu (United States)	Central Pacific N: 60°N S: 0°N W: 180°W E: 140°W	May - November	Anchorage Guam Honolulu Kansas City Tahiti
New Delhi (India)	1) Bay of Bengal 2) Arabian Sea: N: Coastline S: 5°N W: ~~60~~45°E E: 100°E	April - June October- December	Calcutta Chennai Colombo Dhaka Delhi Jakarta Karachi Kuala Lumpur Male Mumbai Tehran Yangon
Darwin (Australia)	1) South-East Indian Ocean N: 0°S S: 36°S W: 90°E E: 141°E 2) South-West Pacific Ocean N: 0°S S: 40°S W: 141°E E: 160°E	November - April	Adelaide Biak Brisbane Colombo Darwin Denpasar Hobart Honiara Jakarta Melbourne Perth Port Moresby Sydney Townsville Ujung Pandang
Nadi (Fiji)	Southern Pacific N: 0°S S: 40°S W: 160°E E: 120°W	November - April	Brisbane Hobart Honiara Honolulu Melbourne Nadi Nauru Sydney Tahiti Townsville Wellington

TROPICAL CYCLONE ADVISORY CENTRE	AREA OF RESPONSIBILITY[1]	TROPICAL CYCLONE SEASON[2]	MWOs TO WHICH ADVISORY INFORMATION IS TO BE SENT
1	2	3	4
Tokyo (Japan)	Western Pacific (including South China Sea) N: 6 0°N S: 0°N W: 100°E E: 180°E	January - December	Bangkok Biak Denpasar Guam Guangzhou Gia Lam Hong Kong Honolulu Jakarta Kansas City Kota Kinabalu Kuala Lumpur Manila Nadi Naha Nauru Phnom-Penh Pyongyang Shanghai Singapore Seoul Taibei Tokyo Ujung Pandang

NOTES/NOTAS:

1 Co-ordinates of the areas of responsibility of the Darwin and Nadi Tropical Cyclone Advisory Centres to be confirmed./Les coordonnées des zones de responsabilité des centres d'avis de cyclones tropicaux Darwin et Nadi sont à confirmer./Coordenadas por confirmar de la zona de responsabilidad de los centros de asesoramiento de ciclones tropicales de Darwin y Nadi.

2 Indicates approximately the main seasons for tropical cyclones./Indique approximativement les principales saisons de cyclones tropicaux/ Indica aproximadamente la estación principal de ciclones tropicales.

APPENDIX C

FASID TABLE MET 3B — VOLCANIC ASH ADVISORY CENTRES

EXPLANATION OF THE TABLE

Column

1. Location 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. MWOs to which the advisory information on volcanic ash should be sent.
5. ICAO location indicator of the MWOs in Column 4.
6. ACCs to which the advisory information on volcanic ash should be sent.
7. ICAO location indicator of the ACCs in Column 6.

Note: MWOs and ACCs in italics are situated outside the Asia/Pacific Region

---

VOLCANIC ASH ADVISORY CENTRE	ICAO LOCATION INDICATOR	AREA OF RESPONSIBILITY	MWOs TO WHICH ADVISORY INFORMATION IS TO BE SENT		ACC TO WHICH ADVISORY INFORMATION IS TO BE SENT	
			Name	ICAO LOCATION INDICATOR	Name	ICAO LOCATION INDICATOR
1	2	3	4	5	6	7
Anchorage (United States)	PAWU	Anchorage Oceanic Anchorage Continental Anchorage Arctic and west to E150, north of N60	Anchorage	PAWU	Anchorage	PAZA
Darwin (Australia)	YDRM (ADRM)	Southward from N10 and from E100 to E160 and the Perth 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 E6 E75	Adelaide	YPRM	Adelaide	YPAD
			Bangkok	VTBD	Bangkok	VTBB
			Brisbane	YBRF	Brisbane Cairns	YBBN YBCS
			Chennai	VOMM	Chennai	VOMF
			Darwin	YDRM	Darwin	YPDN
			Gia Lam	VVGL	Hanoi Ho-Chi-Minh	VVNB VVTS
			Guam	PGUM		
			Hobart	YMHF	Hobart	
			Honiara	AGGH	Honiara	AGGH
			Jakarta	WIII	Jakarta	WIIF
			Kota Kinabalu	WBKK	Kota Kinabalu	WBFC
			Kuala Lumpur	WMKK	Kuala Lumpur	WMFC
			Manila	RPLL	Manila	RPHI
			Melbourne	YMRF	Melbourne	YMMM
			Perth	YPRF	Perth	YPPH
			Port Moresby	AYPY	Port Moresby	AYPM
			Singapore	WSSS	Singapore	WSJC
			Sydney	YSRF	Sydney	YSSY
			Townsville	YBTL	Townsville	YBTL
			Ujung Pandang	WAAA	Ujung Pandang	WAAF
			Yangon	VYYY	Yangon	VYYY
Tokyo (Japan)	RJTD	N60 to N10 – and from E90 to Oakland Oceanic and Anchorage Oceanic and Continental FIR boundaries	Bangkok	VTBD	Bangkok	VTBB
			Blagoveschensk	*UHBB*	*Blagoveschensk*	*UHBB*
			Beijing	ZBAA	Beijing Huhhot Taiyuan	ZBPE ZBHH ZBYN
			Bratsk	*UIBB*	*Bratsk*	*UIBB*
			Chita	*UIAA*	*Chita*	*UIAA*
			Gia Lam	VGLL	Hanoi Ho-Chi-Minh	VVNB VVTS

VOLCANIC ASH ADVISORY CENTRE	ICAO LOCATION INDICATOR	AREA OF RESPONSIBILITY	MWOs TO WHICH ADVISORY INFORMATION IS TO BE SENT		ACC TO WHICH ADVISORY INFORMATION IS TO BE SENT	
			Name	ICAO LOCATION INDICATOR	Name	ICAO LOCATION INDICATOR
1	2	3	4	5	6	7
			uaGndzhou	ZGGG	Guandzhou Changsha Guilin Nanning Sanya	ZGZU ZGCS ZGKL ZGNN ZJSA
			Hong Kong	VHHH	Hong Kong	VHHH
			Incheon	RKSI		RKRR
			Irkutsk	*UIII*	*Irkutsk*	*UIII*
			Khabarovsk	*UHHH*	*Khabarovsk*	*UHHH*
			Kirensk	*UIKK*	*Kirensk*	*UIKK*
			Kunming	ZPPP	Kunming Chengdu Chongqing	ZPKM ZUDS ZUCK
			Lanzhou	ZLLL	Lanzhou Xi'an	ZLAN ZLSN
			Magadan	*UHMM*	*Magadan*	*UHMM*
			Magdagachi	*UHBI*	*Magdagachi*	*UHBI*
			Manila	RPLL	Manila	RPHI
			Nik.-na-Amure	*UHNN*	*Nik.-na-Amure*	*UHNN*
			Okha	*UHSH*	*Okha*	*UHSH*
			Okhotsk	*UHOO*	*Okhotsk*	*UHOO*
			Pet.-Kamchatsky	*UHPP*	*Pet.-Kamchatsky*	*UHPP*
			Phnom-Penh	VDPP	Phnom-Penh	VDPP
			Pyongyang	ZKPY	Pyongyang	ZKKK
			Shanghai	ZSSS	Shanghai Hefei Jinan Nanchang Nanjing Xiamen Qingdao	ZSHA ZSOF ZSTN ZSCN ZSNJ ZSAM ZSQD
			Shenyang	ZYTX	Shenyang Dalian Harbin	ZYSH ZYTL ZYHB
			Taibei	RCTP	Taibei	RCTP
			Tokyo		Tokyo Naha Fukuoka Osaka	RJTI ROAH RJDG RJOO
			Ulan-Bator	ZMUB	Ulan-Bator	ZMUB
			Urumqi	ZWWW	Urumqi	ZWWW
			Vientiane	VLVT	Vientiane	VLVT
			Vladivostok	*UHWW*	*Vladivostok*	*UHWW*
			Wuhan	ZHHH	Wuhan	ZHWH
			Yuzhnosakhalinsk	*UHSS*	*Yuzhnosakhalinsk*	*UHSS*

VOLCANIC ASH ADVISORY CENTRE	ICAO LOCATION INDICATOR	AREA OF RESPONSIBILITY	MWOs TO WHICH ADVISORY INFORMATION IS TO BE SENT		ACC TO WHICH ADVISORY INFORMATION IS TO BE SENT	
			Name	ICAO LOCATION INDICATOR	Name	ICAO LOCATION INDICATOR
1	2	3	4	5	6	7
Washington (United States)	KNES	Oakland Oceanic FIR	Guam Honolulu Kansas City	PGUM PHFO KMKC	Oakland Honolulu Kansas City	KZOA PHZH KZKC
Wellington (New Zealand)	NZKL	Southward from the Equator and from E160 to W140*	Brisbane Honolulu Honiara Melbourne Nadi Nauru Sydney Tahiti Wellington	YBRF PHFO AGGH YMRF NFFN ANAU YSRF NTAA NZKL	Brisbane Honolulu Honiara Melbourne Nadi Nauru Sydney Tahiti Auckland Christchurch	YBBN PHZH AGGH YMMM NFFF ANAU YSSY NTTT NZZO NZZC

*Note. – Coverage south of 60°S latitude is currently not feasible.

APPENDIX D

LIST OF THE ABBREVIATIONS AND CODE WORDS USED IN SIGMET

ABV	Above
AND*	And
APRX	Approximate or approximately
AT	At *(followed by time)*
BLW	Below
BY*	By
CB	Cumulonimbus
CENTRE*	Centre *(used to indicate tropical cyclone centre)*
CLD	Cloud
CNL	Cancel *or* cancelled
CTA	Control area
DS	Duststorm
E	East *or* eastern longitude
ERUPTION*	Eruption *(used to indicate volcanic eruption)*
EMBD	Embedded in layer *(to indicate CB embedded in layer of other clouds)*
FCST	Forecast
FIR	Flight information region
FL	Flight level
FRQ	Frequent
FZRA	Freezing rain
GR	Hail
HVY	Heavy *(used to indicate intensity of weather phenomena)*
ICE	Icing
INTSF	Intensify *or* intensifying
ISOL	Isolated
KM	Kilometers
KMH	Kilometers per hour
KT	Knots
MOD	Moderate *(used to indicate intensity of weather phenomena)*
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	Observed
OBSC	Obscured
OCNL	Occasional
OF*	Of … *(place)*
OTLK	Outlook *(used in SIGMET messages for volcanic ash and tropical cyclones)*
RA	Rain
S	South *or* southern latitude
SE	South-east
SEV	Severe *(used e.g. to qualify icing and turbulence reports)*
SIGMET	SIGMET *(used to indicate SIGMET information)*

SQL	Squall line
SS	Sandstorm
SST	Supersonic transport *(used to indicate a SIGMET for supersonic levels)*
STNR	Stationary
SW	South-west
TC	Tropical cyclone
TO	To … *(place)*
TOP	Cloud top
TS	Thunderstorm
TURB	Turbulence
UIR	Upper flight information region
VA	Volcanic ash
VALID*	Valid
W	West *or* western longitude
WI	Within
Z	Coordinated Universal Time *(used in meteorological messages)*

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

APPENDIX E

METEOROLOGICAL PHENOMENA TO BE REPORTED BY SIGMET

	Phenomenon	Description	Meaning
Subsonic cruising level	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[8]	Severe turbulence
	ICE	SEV ICE SEV ICE FZRA	Severe icing Severe icing due to freezing rain
	MTW	SEV MTW[9]	Severe mountain wave
	DS	HVY DS	Heavy duststorm
	SS	HVY SS	Heavy sandstorm
	VA	VA (+ volcano name, if known)	Volcanic ash (+ volcano name)
Transonic levels and supersonic cruising levels	TURB	MOD TURB[8] SEV TURB[8]	Moderate turbulence Severe turbulence
	CB	ISOL[6] CB OCNL[7] CB FRQ CB	Isolated cumulonimbus Occasional cumulonimbus Frequent cumulonimbus
	GR	GR	Hail
	VA	VA (+ volcano name, if known)	Volcanic ash (+ volcano name)

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. Isolated (**ISOL**) indicates an area of individual CB and/or thunderstorms with a maximum spatial coverage less than 50% of the area affected, or forecasts to be affected, by the phenomenon (at a fixed time or during the period of validity)*

*7 Occasional (**OCNL**) indicates an area of well-separated CB and/or thunderstorms with a maximum spatial coverage between 50 and 75% of the area affected, or forecasts to be affected, by the phenomenon (at a fixed time or during the period of validity)*

*8 Severe (**SEV**) and moderate (**MOD**) 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 turbulence index is between 15 and 27 (i.e., the peak value of the eddy dissipation rate (EDR) exceeds 0.5); and*
    - *moderate - whenever the turbulence index is between 6 and 14 (i.e., the peak value of the eddy dissipation rate (EDR) exceeds 0.3 while not exceeding 0.5).*

*9 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 ~~shall~~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.) ~~shall~~should be used in order to allow for a straightforward interpretation by the user.

4. 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".

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

1.1 SIGMETs 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 VVVV-
VVTS HOCHIMINH FIR EMBD TS OBS S OF LINE N1420 E10930 - N1000 E10400 TOP
FL280 MOV W 10KMH WKN=


WSUK31 EGGY 121120
EGTT SIGMET 01 VALID 121125/121525 EGRR-
EGTT LONDON FIR EMBD TS GR 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 280600/281200 YMMC-
YBBB BRISBANE FIR SEV TURB FCST 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 AND FCST NE OF THE SOUTH ISLAND BLW FL100
STNR NC=
```

1.3 SIGMET for severe icing

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

WSIY31 LIIB 032152
LIMM SIGMET 07 VALID 032200/040200 LIMM-
```

```
LIMM MILANO FIR SEV ICE FCST 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 AND FCST 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
EGTT SIGMET 03 VALID 150600/151000 EGRR-
EGTT LONDON FIR SEV MTW FCST N OF N5100 FL090/140 STNR WKN=
```

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 LOC 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
OTLK 212300 VA CLD APRX S1600 E07806 – S1642 E08412 – S1824 E08900 – S1906
E08100 220500 VA CLD APRX S1700 E08100 – S1812 E08636 – S2000 E09224 – S2130
E08418
```

Notes:

1. *It is recommended that the OTLK part starts on a new line to make the message easier to read.*
2. *The coordinates used in describing the VA cloud are fictitious.*

2.2 "Short" first SIGMET (no OUTLOOK)

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

WVFJ01 NFFN 090900
NFFF SIGMET 03 VALID 090915/091515 NFFN-
NFFF NADI FIR VA ERUPTION MT LOPEVI LOC 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
OTLK 212300 VA CLD APRX S1600 E07806 – S1642 E08412 – S1824 E08900 – S1906
E08100 220500 VA CLD APRX S1700 E08100 – S1812 E08636 – S2000 E09224 – S2130
E08418=
```

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 before 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 send at 0230Z.

```
WVXY01 YUSO 210230
YUDD SIGMET 2 VALID 210800/211400 YUSO-
YUDD SHANLON FIR/UIR VA CLD FCST 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
OTLK 212000 VA CLD APRX S1600 E07806 – S1642 E08412 – S1824 E08900 – S1906
E08100
```

Notes:

1. *The forecast position at 0800Z and 1400Z is taken from the VA advisory*
2. *The outlook part is limited to the +6 hour forecast because at the moment of issuing the SIGMET there is no information available beyond this period from the VAAC.*

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
OTLK 281700 TC CENTRE S1835 E12218 010400 TC CENTRE S1910 E12240=
```

~~3.2.~~1.1. 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
OTLK 202100 TC CENTRE N1829 E11304 210300 TC CENTRE N1902 E11208=
```

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
OTLK 210000 TC CENTRE N1850 E11210 210600 TC CENTRE N1920 E11130=

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
OTLK 210300 TC CENTRE N1900 E11156 210900 TC CENTRE N1938 E11107=
```

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.

APPENDIX H

WMO HEADINGS FOR SIGMET BULLETINS USED BY ASIA/PAC METEOROLOGICAL WATCH OFFICES

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
AUSTRALIA						*Note: Non-ICAO location indicators are used in the WMO headings*
ADELAIDE/Adelaide	YPRM	WSAU31			YMMM	APRM
BRISBANE/Brisbane	YBRF	WSAU31	WCAU01		YBBB	ABRF
					YMMM	
DARWIN/Darwin	YDRM	WSAU31	WCAU01	WVAU01	YBBB	ADRM
					YMMM	
HOBART/Hobart	YMHF	WSAU31			YMMM	AMHF
MELBOURNE/Melbourne	YMRF	WSAU31			YBBB	AMRF
					YMMM	
PERTH/Perth	YPRF	WSAU31	WCAU01		YBBB	APRF
					YMMM	
SYDNEY/Sydney	YSRF	WSAU31			YBBB	ASRF
					YMMM	
TOWNSVILLE	YBTL	WSAU31			YBBB	ABTL
BANGLADESH						
DHAKA/Zia Intl	VGZR	WSBW20	WCBW20		VGFR	
CAMBODIA						
PHNOM-PENH/Pochentong	VDPP				VDPP	MWO not established
CHINA						
BEIJING/Capital	ZBAA	WSCI33			ZBPE	
CHENGDU/Shuangliu	ZUUU	WSCI36				
GUANGZHOU/Baiyun	ZGGG	WSCI35			ZGZU	
KUNMING/Wujiaba	ZPPP	WSCI36			ZPKM	
LANZHOU/Chongchuan	ZLLL	WSCI37			ZLHW	
SHANGHAI/Hongqiao	ZSSS	WSCI34			ZSHA	
SHENYANG/Taoxian	ZYTX	WSCI38			ZYSH	
TAIBEI/Taibei Intl	RCTP	WSCI31	WCCI31	WVCI31	RCTP	
URUMQI/Diwopu	ZWWW	WSCI39			ZWUQ	
WUHAN/Tianhe	ZHHH	WSCI35			ZHWH	
HONG KONG/Hong Kong Intl	VHHH	WSSS20	WCSS20	WVSS01	VHHK	

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
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA						
PYONGYANG/Sunan	ZKPY				ZKKK	No SIGMET issued
FIJI						
NADI/Nadi Intl	NFFN	WSFJ01,02,…	WCFJ01,02,…	WVFJ01,02,…	NFFF	
FRENCH POLYNESIA						
TAHITI/Faaa	NTAA	WSPF21,22	WCPF21	WVPF21	NTTT	
INDIA						
CALCUTTA/Calcutta	VECC	WSIN31	WCIN31		VECF	
CHENNAI/Chennai	VOMM	WSIN31	WCIN31		VOMF	
DELHI/Indira Ghandi Intl	VIDP	WSIN31	WCIN31		VIDF	
MUMBAI/Jawaharlal Nehru Intl	VABB	WSIN31	WCIN31		VABF	
INDONESIA						
JAKARTA/Soekarno-Hatta Intl	WIII	WSID20	WCID20	WVID20	WIIZ	
UJUNG PANDANG/Hasanuddin	WAAA	WSID21	WCID21	WVID21	WAAZ	
JAPAN						
TOKYO/Narita Intl	RJAA	WSJP31	WCJP31	WVJP31	RORG RJTG	
LAO PEOPLE'S DEMOCRATIC REPUBLIC						
VIENTIANE/Wattay	VLVT	WSLA31		WVLA31	VLVT	Not confirmed
MALAYSIA						
KOTA KINABALU/Kota Kinabalu Intl	WBKK	-	-	-	WBFC	
KUALA LUMPUR/Kuala Lumpur Intl	WMKK	WSMS31	WCMS31	WVMS31	WMFC	
MALDIVES						
MALE/Hulule	VRMM	WSMV31			VRMM	
MONGOLIA						
ULAN BATOR/Ulan Bator	ZMUB	WSMO31			ZMUB	Not confirmed

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
MYANMAR YANGON/Yangon Intl	VYYY	WSBM31	WCBM31		VYYY	Not confirmed
NAURU NAURU I./Nauru	ANAU				ANAU	No Information
NEPAL KATHMANDU/Tribhuvan Intl	VNKT	WSNP31			VNSM	Not confirmed
NEW ZEALAND WELLINGTON/Kelburn Intl[3]	NZKL	WSNZ21 WSPS21	WCNZ21 WCPS21	WVNZ21 WVPS21	NZZO NZZC	
NORTHERN MARIANA ISLANDS (United States) SAIPAN I. (OBYAN)/Saipan I.(Obyan) Intl	PGSN					No Information
PAKISTAN KARACHI/Quaid-E-Azam Intl LAHORE/Lahore	OPKC OPLA	WSPK31 WSPK31	WCPK31		OPKR OPLR	
PAPUA NEW GUINEA PORT MORESBY/Jacksons	AYPY	WSNG20	WCNG20	WVNG20 WVNG01	AYPY	
PHILIPPINES MANILA/Ninoy Aquino Intl	RPLL	WSPH31	WCPH31	WVPH31	RPHI	
REPUBLIC OF KOREA INCHEON/Incheon Intl	RKSI	WSKO31	WCKO31	WVKO31	RKRR	
SINGAPORE SINGAPORE/Singapore Changi	WSSS	WSSR20	WCSR20	WVSR20	WSJC	
SOLOMON ISLANDS HONIARA/Henderson	AGGH				AGGG	No Information
SRI LANKA COLOMBO/Katunayake	VCBI	WSSB31	WCSB31		VCBI	

[3] Operational monitoring coverage south of 60˚S is limited due to the lack of information

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
THAILAND						
BANGKOK/Bangkok Intl	VTBD	WSTH31	WCTH31	WVTH31	VTBB	
UNITED STATES						
ANCHORAGE/Anchorage Intl	PAWU	WSAK01-09 PAWU	WCAK01-09 PAWU	WVAK01-09 PAWU	PAZA	
HONOLULU/Honolulu Intl	PHFO	WSPA01-13 PHFO	WCPA01-13 PHFO	WVPA 01-13 PHFO	KZOA	
(KANSAS CITY/Missouri) (National Aviation Weather Advisory Unit, known as the Aviation Weather Centre)	KKCI	WSNT01-13 KKCI	WCNT01-13 KKCI	WVNT01-13 KKCI	KZNY KZMA KZHU TJZU	
(KANSAS CITY/Missouri) (National Aviation Weather Advisory Unit, known as the Aviation Weather Centre)	KKCI	WSPN01-13 KKCI	WCPN01-13 KKCI	WVPN01-13 KKCI	KZOA	
VIET NAM						
Gialam MWO	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)

Table: WMO HEADINGS FOR FK AND FV BULLETINS USED BY ASIA/PAC TCACs AND VAACs

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)
		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)

TCAC/VAAC (State)	ICAO location indicator	WMO Heading TTAAii CCCC	Remarks
1	2	3	4
Nadi (Fiji)	NFFN	FKPS01 NFFN	
Tokyo (Japan)	RJTD	FKPQ30-35 RJTD	
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	
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 resp.
Wellington (New Zealand)	NZKL	FVPS01 NZKL	

— END —

APPENDIX C

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT TO ANNEX 3

The text of the proposed amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading as shown below:

~~Text to be deleted is shown with a line through it.~~	text to be deleted
New text to be inserted is highlighted with grey shading.	new text to be inserted
~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

PROPOSED AMENDMENT TO

INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES

METEOROLOGICAL SERVICE
FOR INTERNATIONAL AIR NAVIGATION

ANNEX 3
TO THE CONVENTION OF INTERNATIONAL CIVIL AVIATION

FIFTEENTH EDITION — JULY 2004

PART I — Core SARPs

. . .

CHAPTER 5. AIRCRAFT OBSERVATIONS AND REPORTS

. . .

5.3 Routine aircraft observations - designation

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

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PART II — *Appendices and Attachments to Annex 3*

. . .

APPENDIX 4. TECHNICAL SPECIFICATIONS RELATED TO AIRCRAFT OBSERVATIONS AND REPORTS

(See Chapter 5 of this Annex.)

1. CONTENTS OF AIR-REPORTS

1.1 Routine air-reports by air-ground data link

1.1.1 When air-ground data link is used and automatic dependent surveillance (ADS) or Mode S is being applied, the elements contained in routine air-reports shall be:

Message type designator
Aircraft identification

Data block 1
- Latitude
- Longitude
- Level
- Time

Data block 2
- Wind direction
- Wind speed
- Wind quality flag
- Temperature
- Turbulence (if available)
- Humidity (if available)

Note.— When ADS or Mode S is being applied, the requirements of routine air-reports may be met by the combination of the basic ADS/Mode S data block (data block 1) and the meteorological information data block (data block 2), available from ADS or Mode S reports. The ADS message format is specified in the PANS-ATM (Doc 4444), ~~Part II, Section 14.4~~4.11.4 and Chapter 13 and the Mode S message format is specified in Annex 10, Volume III, Part I - Digital Data Communication Systems*, Chapter 5.*

1.1.2 When air-ground data link is used while ADS and Mode S is not being applied, the elements contained in routine reports shall be in accordance with 1.3.

Note.— When air-ground data link is used while ADS and Mode S is not being applied, the requirements of routine air-reports may be met by the controller-pilot data link communication (CPDLC)

application entitled "Position report". The details of this data link application are specified in the Manual of Air Traffic Services Data Link Applications *(Doc 9694) and in Annex 10, Volume III, Part I.*

. . .

2. CRITERIA FOR REPORTING

. . .

2.6 Turbulence

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

2.6.1 Routine air-reports

The turbulence shall be reported during the en-route phase of the flight and shall refer to the 15-minute period immediately preceding the observation. Both the average and peak value of turbulence, together with the time of occurrence of the peak value to the nearest minute, shall be observed. The average and peak values shall be reported in terms of ~~a turbulence index comprising seven intensity levels~~the cube root of EDR ~~as indicated in Table A4-1~~. The time of occurrence of the peak value shall be reported as indicated in Table ~~A42~~A4-1. The turbulence shall be reported the climb-out phase for the first 10 minutes of the flight and shall refer to the 30-second period immediately preceding the observation. The peak value of turbulence shall be observed.

2.6.2 Interpretation of the turbulence ~~index~~report

Turbulence shall be considered:

a) severe when the peak value of the cube root of EDR~~turbulence index is between 15 and 27 (i.e. the peak value of the EDR is exceeding 0.5)~~exceeds 0.7;

b) moderate when the peak value of the cube root of EDR~~turbulence index~~ is above~~between 6~~0.4 and ~~14~~below or equal to 0.7 ~~(i.e. the peak value of the EDR is exceeding 0.3 while not exceeding 0.5)~~;

c) light when the peak value of the cube root of EDR~~turbulence index~~ is ~~between~~ above 0.1 and ~~5~~below or equal to 0.4 ~~(i.e. the peak value of the EDR is between 0.1 and 0.3)~~; and

d) nil when the peak value of the cube root of EDR~~turbulence index~~ is ~~0 (i.e. the peak value of the EDR is less than 0.1)~~less than 0.1.

Note.— The EDR is an aircraft-independent measure of turbulence. However, the relationship between the EDR index and the perception of turbulence is a function of aircraft type, and the mass, altitude,

configuration and airspeed of the aircraft.The EDR values given above describe the severity levels for a medium-sized transport aircraft under typical en-route conditions (i.e. altitude, airspeed and weight).

2.6.3 Special air-reports

Special air-reports on turbulence shall be made during any phase of the flight whenever the peak value exceeds the EDR value of 0.5. The special air-report on turbulence shall be made with reference to the 1minute period immediately preceding the observation. Both the average and peak value of turbulence shall be observed. The average and peak values shall be reported in terms of ~~a turbulence index as indicated in the shaded part of Table A4-1~~the cube root of EDR. Special air-reports shall be issued every minute until such time that the peak values of turbulence fall below the EDR value of 0.~~5~~7.

2.7Humidity

The humidity shall be reported as the relative humidity, rounded to the nearest whole per cent.

. . .

Editorial Note.— *Delete Table A4-1 in toto*

Table A4-~~2~~1. Time of occurrence of the peak value to be reported

Peak value of turbulence occurring during the one-minute period ..... minutes prior to the observation	*Value to be reported*
0 – 1	0
1 – 2	1
2 – 3	2
. . .	. . .
13 – 14	13
14 – 15	14
No timing information available	15

Table A4-~~3~~2. Template for the special air-report (downlink)

Key: M = mandatory, part of every message
C = inclusion conditional; included whenever available

Note.—Message to be prompted by the pilot-in-command. Currently only the condition "SEV TURB" can be automated (see 2.6.3).

Element as specified in Chapter 5	*Detailed content*	*Template(s)*	*Examples*
Message type designator (M)	Type of the air-report (M)	ARS	ARS
Aircraft identification (M)	Aircraft radiotelephony call sign (M)	nnnnnn	VA812
DATA BLOCK 1			
Latitude (M)	Latitude in degrees and minutes (M)	Nnnnn *or* Snnnn	S4506
Longitude (M)	Longitude in degrees and minutes (M)	Wnnnnn *or* Ennnnn	E01056
Level (M)	Flight level (M)	FLnnn	FL330
Time (M)	Time of occurrence in hours and minutes (M)	OBS AT nnnnZ	OBS AT 1216Z
DATA BLOCK 2			
Wind direction (M)	Wind direction in degrees true (M)	nnn/	262/
Wind speed (M)	Wind speed in kilometres per hour (or knots) (M)	nnnKMH (*or* nnnKT)	158KMH (079KT)
Wind quality flag (M)	Wind quality flag (M)	n	1
Temperature (M)	Air temperature in tenths of degrees C (M)	T[M]nnn	T127 TM455
Turbulence (C)	Turbulence ~~index~~ and the time of occurrence of the peak value (C)[1]	EDRnnn/nn	EDR~~16~~0.64/08
Humidity (C)	Relative humidity in per cent (C)	RHnnn	RH054
DATA BLOCK 3			
Condition prompting the issuance of a special air-report (M)		SEV TURB [EDRnnn][2] *or* *SEV ICE or* SEV MTW *or* TS GR[3] *or* *TS*[3] *or* *HVY SS*[4] *or* *VA CLD [FL nnn/nnn] or* VA[5] [MT nnnnnnnnnnnnnnnnnnnn]	SEV TURB EDR~~16~~0.76; VA CLD FL050/100

Notes. .—

1. The~~ index and the~~ time of occurrence to be reported in accordance with Table~~s~~ A4-1 and A4-2~~, respectively~~.
2. The turbulence ~~index~~ to be reported in accordance with 2.6.3~~ and Table A4-1~~.
3. Obscured, embedded or widespread thunderstorms or thunderstorms in squall lines.
4. Duststorm or sandstorm.
5. Pre-eruption volcanic activity or a volcanic eruption.

Table A4-~~4~~3. Ranges and resolutions for the meteorological elements included in air-reports

Element as specified in Chapter 5		Range	Resolution
Wind direction:	°true	000 – 360	1
Wind speed:	KMH KT	00 – 500 00 – 250	21
Wind quality flag:	(index)*	0 – 1	1
Temperature:	°C	–80 – +60	0.1
Turbulence: routine air-report:	~~(index)*~~$m^{2/3}$ s^{-1} (time of occurrence)*	0 – ~~28~~2 0 – 15	~~10.021~~
Turbulence: special air-report:	~~(index)*~~$m^{2/3}$ s^{-1}	~~15~~0 – ~~27~~2	~~10.02~~
Humidity:	%	0 – 100	1

* Non-dimensional

. . .

APPENDIX 5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS

(See Chapter 6 of this Annex.)

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

5.1 Format and content of GAMET area forecasts

When prepared in GAMET format, they shall contain two sections: Section I related to information on en-route weather phenomena hazardous to low-level flights, prepared in support of the issuance of AIRMET information, and Section II related to additional information required by low-level flights. ~~The area forecasts shall contain the following information as necessary and, when prepared in GAMET format, in the order indicated.~~ The content and order of elements in a GAMET area forecast, when prepared should be in accordance with the template shown in Table A5-4. Additional elements in Section II shall be included in accordance with regional air navigation agreement~~:~~.

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Editorial Note.— Delete remainder text of 5.1 and *insert* the following Table A5-4 after Table A5-3.

Table A5-4 Template for GAMET

Key M = inclusion mandatory, part of every message
= = double line indicates that the text following it should be placed on the subsequent line

Element	*Detailed content*	*Template*	*Example*
Location indicator of FIR/CTA (M)	ICAO location indicator of the ATS unit serving the FIR or CTA to which the GAMET refers (M)	nnnn	YUCC[11]
Identification (M)	Message identification (M)	GAMET	GAMET

Element	*Detailed content*	*Template*	*Example*
Validity period (M)	Date-time groups indicating the period of validity in UTC (M)	VALID nnnnnn/nnnnnn	VALID 220600/221200
Location indicator of meteorological office (M)	Location indicator of meteorological office originating the message with a separating hyphen (M)	nnnn-	YUDO-[1]
Name of the FIR/CTA *or* part thereof (M)	Name of the FIR/CTA, *or* part thereof for which the GAMET is issued (M)	nnnnnnnnnn FIR[/n] [BLW FLnnn] *or* nnnnnnnnnn CTA[/n] [BLW FLnnn]	AMSWELL FIR/2 BLW FL120 AMSWELL FIR

		Template			
Element	*Detailed content*	*Identifier and time*	*Element*	*Location*	*Example*
Indicator for the beginning of Section I (M)	Indicator to identify the beginning of Section I (M)		SECN I		SECN I
Surface wind	Widespread surface wind exceeding 60 km/h (30 kt)	SFC WSPD: [nn/nn]	[n]nn KMH *or* [n]nn KT	[N of Nnn *or* Snn] *or* [S of Nnn *or* Snn] *or* [W of Wnnn *or* Ennn] *or* [E of Wnnn *or* Ennn] *or* nnnnnnnnnn[2]	SFC WSPD: 10/12 65 KMH SFC WSPD: 40 KT E OF W110
Surface visibility	Widespread surface visibility below 5 000 m including the weather phenomena causing the reduction in visibility	SFC VIS: [nn/nn]	nnnn M FG *or* BR *or* SA *or* DU *or* HZ *or* FU *or* VA *or* PO *or* DS *or* SS *or* DZ *or* RA *or* SN *or* SG *or* IC		SFC VIS: 06/08 3000 M BR N of N51
Significant weather	Significant weather conditions encompassing thunderstorms and heavy sand- and duststorm	SIGWX: [nn/nn]	ISOL *or* OCNL *or* FRQ *or* OBSC *or* EMBD TS *or* DS *or* SS		SIGWX: 11/12 ISOL TS SIGWX: 12/14 SS S OF N35
Mountain obscuration	Mountain obscuration	MT OBSC: [nn/nn]	nnnnnnnnnn[2]		MT OBSC: MT PASSES S OF N48

		Template			
Element	*Detailed content*	*Identifier and time*	*Element*	*Location*	*Example*
Cloud	Widespread areas of broken or overcast cloud with height of base less than 300 m (1 000 ft) above ground level (AGL) or above mean sea level (AMSL) and/or any occurrence of cumulonimbus (CB) or towering cumulus (TCU) clouds	SIG CLD: [nn/nn]	BKN *or* OVC nnn[n]/nnn[n] M *or* nnn[n]/nnn[n] FT AGL *or* AMSL ISOL *or* OCNL *or* FRQ *or* OBSC *or* EMBD CB[2] *or* TCU[3] nnn[n]/nnn[n] M *or* nnn[n]/nnn[n] FT AGL *or* AMSL		SIG CLD: 06/09 OVC 800/1100 FT AGL N OF N51 10/12 ISOL TCU 1200/8000 FT AGL
Icing	Icing (except for that occurring in convective clouds and for severe icing for which a SIGMET message has already been issued)	ICE: [nn/nn]	MOD FLnnn/nnn *or* MOD ABV FLnnn		ICE: MOD FL050/080
Turbulence	Turbulence (except for that occurring in convective clouds and for severe turbulence for which a SIGMET message has already been issued)	TURB: [nn/nn]	MOD FLnnn/nnn *or* MOD ABV FLnnn		TURB: MOD ABV FL090
Mountain wave	Mountain wave (except for severe mountain wave for which a SIGMET message has already been issued)	MTW: [nn/nn]	MOD FLnnn/nnn *or* MOD ABV FLnnn		MTW: MOD ABV FL080 N OF N63
SIGMET	SIGMET messages applicable to the FIR/CTA concerned or a sub-area thereof, for which the area forecast is valid		SIGMET APPLICABLE: n		SIGMET APPLICABLE: 3,5
or HAZARDOUS WEATHER NIL					
Indicator for the beginning of Section II (M)	Indicator to identify the beginning of Section II (M)		SECN II		SECN II

		Template			
Element	*Detailed content*	*Identifier and time*	*Element*	*Location*	*Example*
Pressure centres and fronts	Pressure centres and fronts and their expected movements and developments	PSYS: nn	L [n]nnn HPA *or* H [n]nnn HPA	Nnnnn *or* Snnnn Wnnnnn *or* Ennnnn[FRONT Nnnnn *or* Snnnn Wnnnnn *or* Ennnnn TO Nnnnn *or* Snnnn Wnnnnn *or* Ennnnn] MOV N *or* NE *or* E *or* SE *or* S *or* SW *or* W *or* NW nn KT WKN *or* NC *or* INT	PSYS: 06 L 1004 HPA N5130 E01000 MOV NE 25KT WKN
Upper winds and temperatures	Upper winds and upper-air temperatures for at least the following altitudes: 600, 1 500 and 3 000 m (2 000, 5 000 and 10 000 ft)	WIND/T: [n]nnn M *or* [n]nnn FT	nnn/[n]nn KMH *or* nnn/[n]nn KT PSnn *or* MSnn		WIND/T: 2000 FT 270/70 KMH PS03 5000 FT 250/80 KMH MS02 10000 FT 240/85 KMH MS11
Cloud	Cloud information not included in section I giving type, height of base and top above ground level (AGL) or mean sea level (AMSL)	CLD:	BKN *or* OVC ST *or* SC *or* CU *or* AS *or* AC *or* NS [n]nnn/[n]nnn M *or* [n]nnn/[n]nnn FT AGL *or* AMSL		CLD: BKN SC 2500/8000 FT
Freezing level	Height indication of 0°C level(s) above ground level (AGL) or mean sea level (AMSL), if lower than the top of the airspace for which the forecast is supplied	FZLVL:	nnnn FT AGL *or* AMSL		FZLVL: 3000 FT AGL
Forecast QNH	Forecast lowest QNH during the period of validity	MNM QNH:	[n]nnn HPA		MNM QNH: 1004 HPA
Sea-surface temperature and state of sea	Sea-surface temperature and state of the sea if required by regional air navigation agreement	SEA:	Tnn HGT [n]n M		SEA: T15 HGT 5 M
Volcanic eruptions	Name of volcano	VA:	nnnnnnnnnn or NIL		VA: ETNA

1. Fictitious location
2. Free text describing well known geographical locations or details of mountain obscuration should be kept to a minimum.

3. The location of the CB and/or TCU should be specified in addition to any widespread areas or broken or overcast cloud as given in the example.

. . .

APPENDIX 6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS

(See Chapter 7 of this Annex.)

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1. SPECIFICATIONS RELATED TO SIGMET INFORMATION

1.1 Format of SIGMET messages

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1.1.2 Messages containing SIGMET information ~~for subsonic aircraft~~ shall be identified as: "SIGMET"~~; those containing SIGMET information for supersonic aircraft during transonic or supersonic flight shall be identified as "SIGMET SST"~~.

1.1.3 The sequence number referred to in the template in Table A6-1 shall correspond with the number of SIGMET messages issued for the flight information region since 0001 UTC on the day concerned. ~~Separate series of sequence numbers shall be used for "SIGMET" and "SIGMET SST" messages.~~ The meteorological watch offices whose area of responsibility encompasses more than one FIR and/or CTA shall issue separate SIGMET messages for each FIR and/or CTA within its area of responsibility.

1.1.4 In accordance with the template in Table A6-1, only one of the following phenomena shall be included in a SIGMET message, using the abbreviations as indicated below:

a) at ~~a subsonic~~ cruising levels (irrespective of altitude):

. . .

volcanic ash		
—	volcanic ash ~~(irrespective of altitude)~~	VA (+ volcano name, If known)

~~b) at transonic levels and supersonic cruising levels:~~

~~turbulence~~		
~~—~~	~~moderate turbulence~~	~~MOD TURB~~
~~—~~	~~severe turbulence~~	~~SEV TURB~~
~~cumulonimbus~~		
~~—~~	~~isolated cumulonimbus~~	~~ISOL CB~~
~~—~~	~~occasional cumulonimbus~~	~~OCNL CB~~
~~—~~	~~frequent cumulonimbus~~	~~FRQ CB~~
~~hail~~		
~~—~~	~~hail~~	~~GR~~
~~volcanic ash~~		
~~—~~	~~volcanic ash (irrespective of altitude)~~	~~VA (+ volcano name, if known)~~

. . .

1.1.6 **Recommendation.**— *Meteorological watch offices in a position to do so should issue SIGMET information ~~for volcanic ash cloud and tropical cyclones~~ in graphical format using the WMO BUFR code form, in addition to the issuance of this SIGMET information in abbreviated plain language in accordance with 1.1.1.*

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

1.1.7 **Recommendation.**—*SIGMET, when issued in graphical format, should be as specified in Appendix 1.*

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

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

. . .

4.2.6 Turbulence shall be considered:

a) severe whenever the peak value of the cube root of EDR~~turbulence index is between 15 and 27 (i.e. the peak value of the eddy dissipation rate (EDR)~~ exceeds 0.5~~7)~~; and

b) moderate whenever the peak value of the cube root of EDR~~turbulence index~~ is ~~between~~ ~~6~~above 0.4 and ~~14 (i.e. the peak value of the eddy dissipation rate (EDR) exceeds 0.3 while not exceeding 0.5)~~below or equal to 0.7.

. . .

5. SPECIFICATIONS RELATED TO AERODROME WARNINGS

5.1 Format and dissemination of aerodrome warnings

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5.1.2 The sequence number referred to in the template in Table A6-2 shall correspond with the number of aerodrome warnings issued for the aerodrome since 0001 UTC on the day concerned.

5.1.~~2~~3 **Recommendation.**— *In accordance with the template in Table A6-2, aerodrome warnings should relate to the occurrence or expected occurrence of one or more of the following phenomena:*

- *tropical cyclone (to be included if the 10-minute mean surface wind speed at the aerodrome is expected to be 63 km/h (34 kt) or more)*
- *thunderstorm*
- *hail*
- *snow (including the expected or observed snow accumulation)*
- *freezing precipitation*
- *hoar frost or rime*
- *sandstorm*
- *duststorm*
- *rising sand or dust*
- *strong surface wind and gusts*
- *squall*
- *frost*
- *volcanic ash*
- *other phenomena as agreed locally.*

5.1.~~3~~4 **Recommendation.**— *The use of text additional to the abbreviations listed in the template in Table A6-2 should be kept to a minimum. The additional text should be prepared in abbreviated plain language using approved ICAO abbreviations and numerical values. If no ICAO approved abbreviations are available, English plain language text should be used.*

. . .

6. SPECIFICATIONS RELATED TO WIND SHEAR WARNINGS

6.2 Format and dissemination of wind shear warnings

. . .

6.2.2 The sequence number referred to in the template in Table A6-3 shall correspond with the number of wind shear warnings issued for the aerodrome since 0001 UTC on the day concerned.

Editorial Note.— Renumber subsequent paragraphs accordingly.

Table A6-1. Template for SIGMET and AIRMET messages and special air-reports (uplink)

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

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

Element as specified in Chapter 5 and Appendix 6	*Detailed content*	*Template(s)*				*Examples*
		SIGMET	~~*SIGMET SST1*~~	*AIRMET*	*SPECIAL AIR-REPORT*[21]	
Location indicator of FIR/CTA (M)[32]	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET/ AIRMET refers (M)	nnnn			—	YUCC[43] YUDD[43]
Identification (M)	Message identification and sequence number[54] (M)	SIGMET [nn]n	~~SIGMET SST [nn]n~~	AIRMET [nn]n	ARS	SIGMET 5 SIGMET A3 ~~SIGMET SST 1~~ AIRMET 2 ARS
Validity period (M)	Date-time groups indicating the period of validity in UTC (M)	VALID nnnnnn/nnnnnn			—[65]	VALID 221215/221600 VALID 101520/101800 VALID 251600/252200
Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen (M)	nnnn—				YUDO—[43] YUSO—[43]
Name of the FIR/ CTA *or* aircraft identification (M)	Location indicator and name of the FIR/CTA[76] for which the SIGMET/ AIRMET is issued *or* aircraft radiotelephony call sign (M)	nnnn nnnnnnnnnn FIR[/UIR] *or* nnnn nnnnnnnnnn CTA		nnnn nnnnnnnnnn FIR[/n]	nnnnnn	YUCC AMSWELL FIR[43] YUDD SHANLON FIR/UIR[43] YUCC AMSWELL FIR/2[43] YUDD SHANLON FIR[43] VA812

IF THE SIGMET IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.						
Phenomenon (M)~~[7]~~	Description of phenomenon causing the issuance of SIGMET/AIRMET (C)	OBSC~~[8]~~ TS [GR~~[9]~~] EMBD~~[12]~~[11] TS [GR] FRQ~~[13]~~[12] TS [GR] SQL~~[14]~~[13] TS [GR] TC nnnnnnnnnn SEV TURB~~[11]~~[10] SEV ICE~~[19]~~[18] SEV ICE (FZRA)~~[20]~~[19] SEV MTW~~[21]~~[20] HVY DS HVY SS VA[ERUPTION] [MT nnnnnnnnnn] [LOC Nnn[nn] *or* Snn[nn] Ennn[nn] *or* Wnnn[nn]] VA CLD	~~MOD TURB11~~ ~~SEV TURB~~ ~~ISOL15 CB16~~ ~~OCNL18 CB~~ ~~FRQ13 CB~~ ~~GR~~ ~~VA[ERUPTION]~~ ~~[MT nnnnnnnnnn]~~ ~~[LOC~~ ~~Nnn[nn] *or* Snn[nn]~~ ~~Ennn[nn] *or*~~ ~~*Wnnn[nn]] VA CLD*~~	*SFC WSPD* *nn[n]KMH* *(or* SFC WSPD nn[n]KT) SFC VIS nnnnM (nn)~~[17]~~[16] ISOL~~[15]~~[14] TS[GR]~~[10]~~[9] OCNL~~[18]~~[17] TS[GR] MT OBSC BKN CLD nnn/[ABV]nnnnM (*or* BKN CLD nnn/[ABV]nnnnFT) OVC CLD nnn/[ABV]nnnnM (*or* OVC CLD nnn/[ABV]nnnnFT) ISOL~~[15]~~[14] CB~~[16]~~[15] OCNL~~[18]~~[17] CB FRQ~~[13]~~[12] CB ISOL~~[15]~~[14] TCU~~[16]~~[15] OCNL~~[18]~~[17] TCU~~[16]~~[15] FRQ~~[13]~~[12] TCU MOD TURB~~[11]~~[10] MOD ICE~~[19]~~[18] MOD MTW~~[21]~~[20]	TS TSGR SEV TURB SEV ICE SEV MTW HVY SS VA CLD [FL nnn/nnn] VA [MT nnnnnnnnnn] MOD TURB~~[11]~~[10] GR~~[10]~~[9] CB~~[16]~~[15]	SEV TURB FRQ TS OBSC TSGR EMBD TSGR TC GLORIA VA ERUPTION MT ASHVAL LOC S15 E073 VA CLD MOD TURB MOD MTW ISOL CB BKN CLD 120/900M (BKN CLD 400/3000FT) OVC CLD 270/ABV3000M (OVC CLD 900/ABV10000FT) SEV ICE
Observed or forecast phenomenon (M)	Indication whether the information is observed and expected to continue, *or* forecast (M)	OBS [AT nnnnZ] FCST OBS [AT nnnnZ] AND FCST			OBS AT nnnnZ	OBS AT 1210Z OBS OBS AND FCST
Location (C)	Location (referring to latitude and longitude (in degrees and minutes) *or* locations or geographic features well known internationally)	Nnn[nn] Wnnn[nn] *or* *Nnn[nn] Ennn[nn] or* Snn[nn] Wnnn[nn] *or* *Snn[nn] Ennn[nn]* *or* N OF Nnn[nn] *or* *S OF Nnn[nn] or* *N OF Snn[nn] or* S OF Snn[nn] *or* [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* *W OF Ennn[nn] or* E OF Ennn[nn] *or* [N OF, NE OF, E OF, SE OF, S OF, SW OF, W OF, NW OF] [LINE] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] — Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] *or*			NnnnnWnnnnn *or* *NnnnnWnnnnn or* *SnnnnWnnnnn or* *SnnnnEnnnnn*	*S OF N54* *N OF N50* *N2020 W07005* *YUSB*~~[3]~~ N2706 W07306 N48 E010 N OF N1515 AND W OF E13530 W OF E1554 N OF LINE S2520 W11510 - S2520 W12010 WI N6030 E02550 - N6055 E02500 - N6050 E02630

		[N OF, NE OF, E OF, SE OF, S OF, SW OF, W OF, NW OF, AT] nnnnnnnnnnnn *or* WI Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – [Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]			
Level (C)	Flight level *and* extent~~22~~21(C)	FLnnn *or* FLnnn/nnn *or* TOP FLnnn *or* [TOP] ABV FLnnn *or* [TOP] BLW FLnnn *or* BLW nnnnM (*or* BLW nnnnFT) *or*~~23~~22 CB TOP [ABV] FLnnn WI nnnKM OF CENTRE (*or* CB TOP [ABV] FLnnn WI nnnNM OF CENTRE) or CB TOP [BLW] FLnnn WI nnnKM OF CENTRE (*or* CB TOP [BLW] FLnnn WI nnnNM OF CENTRE) *or*~~24~~23 FLnnn/nnn [APRX nnnKM BY nnnKM] [Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]]] (*or* FLnnn/nnn [APRX nnnNM BY nnnNM] [Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]]])		FLnnn	FL180 FL050/080 TOP FL390 BLW FL200 TOP ABV FL100 FL310/450 CB TOP FL500 WI 270KM OF CENTRE (CB TOP FL500 WI 150NM OF CENTRE) FL310/350 APRX 220KM BY 35KM FL390
Movement or expected movement (C)	Movement or expected movement (direction and speed) with reference to one of the eight points of compass, or stationary (C)	MOV N [nnKMH] *or* MOV NE [nnKMH] *or* MOV E [nnKMH] *or* *MOV SE [nnKMH]* *or* MOV S [nnKMH] *or* MOV SW [nnKMH] *or* MOV W [nnKMH] *or* MOVNW[nnKMH] (*or* MOV N [nnKT] or MOV NE [nnKT] *or* MOV E [nnKT] *or* MOV SE [nnKT] *or* MOVS[nnKT] *or* MOV SW [nnKT] *or* MOV W [nnKT] *or* MOV NW [nnKT]) *or* *STNR*		–	MOV E 40KMH (MOV E 20KT) MOV SE STNR
Changes in intensity (C)	Expected changes in intensity (C)	INTSF *or* WKN *or* NC		–	WKN
Forecast position (C)~~22~~21	Forecast position of volcanic ash cloud *or* the centre of the TC at the end of the validity period of the SIGMET message (C)	FCST nnnnZ TC CENTRE Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] *or* FCST nnnnZ VA CLD APRX Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]]	–	–	FCST 2200Z TC CENTRE N2740 W07345 FCST 1700Z VA CLD APRX S15 E075 – S15 E081 – S17 E083 – S18 E079 – S15 E075
Outlook~~22~~21 (C)	Outlook providing information beyond the period of validity of the trajectory of the volcanic ash cloud and positions of the	OTLK nnnnnn TC CENTRE Nnnnn *or* SnnnnWnnnnn *or* Ennnnn nnnnnn TC CENTRE Nnnnn *or* SnnnnWnnnnn *or* Ennnnn *or* OTLK nnnnn VA CLD APRX [FLnnn/nnn]~~25~~24 Nnn[nn] *or* *Snn[nn]Wnnn[nn] or* Ennn[nn]	–		OTLK 260400 TC CENTRE N28030 W07430 261000 TC CENTRE N3100 W07600 OTLK 212300 VA CLD APRX

	tropical cyclone centre (C)	– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] nnnnnn VA CLD APRX Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn]Wnnn[nn] *or* Ennn[nn]]			S16 E078 – S17 E084 – S18 E089 – S19 E081 – S16 E078 220300 VA CLD APRX S17 E081 – S18 E086 – S20 E092 – S21 E084 – S17 E081

OR

Cancellation of SIGMET/ AIRMET[2625] (C)	Cancellation of SIGMET/AIRMET referring to its identification	CNL SIGMET [nn]n nnnnnn/nnnnnn *or* CNL SIGMET [nn]n nnnnnn/nnnnnn [VA MOV TO nnnn FIR][2423]	~~CNL SIGMET SST [nn]n nnnnnn/nnnnnn~~	CNL AIRMET [nn]n nnnnnn/nnnnnn	—	CNL SIGMET 2 101200/101600[2625] CNL SIGMET 3 251030/251430 VA MOV TO YUDO FIR[2625] ~~CNL SIGMET SST 1 212330/22013026~~ CNL AIRMET 151520/151800[2625]

Notes.—

~~1. In accordance with 1.1.2.~~
~~2~~1. No wind and temperature to be uplinked to other aircraft in flight in accordance with 3.2.
~~3~~2. See 4.1.
~~4~~3. Fictitious location.
~~5~~4. In accordance with 1.1.3 and 2.1.2.
~~6~~5. See 3.1.
~~7~~6. See 2.1.3.
~~8~~7. In accordance with 1.1.4 and 2.1.4.
~~9~~8. In accordance with 4.2.1 a).
~~10~~9. In accordance with 4.2.4.
~~11~~10. In accordance with 4.2.5 and 4.2.6.
~~12~~11. In accordance with 4.2.1 b).
~~13~~12. In accordance with 4.2.2.
~~14~~13. In accordance with 4.2.3.
~~15~~14. In accordance with 4.2.1 c).
~~16~~15. The use of cumulonimbus, CB, is restricted to AIRMETs and SIGMETs related to SST flight during transonic and supersonic cruise; the use of towering cumulus, TCU, is restricted to AIRMETs in accordance with 1.1.4 and 2.1.4.
~~17~~16. In accordance with 2.1.4.
~~18~~17. In accordance with 4.2.1 d).
~~19~~18. In accordance with 4.2.7.
~~20~~19. In accordance with 4.2.7.
~~21~~20. In accordance with 4.2.8.
~~22~~21. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
~~23~~22. Only for SIGMET messages for tropical cyclones.
~~24~~23. Only for SIGMET messages for volcanic ash.
~~25~~24. Up to four layers (or levels) in accordance with 4.2.9.

2~~6~~5. End of the message (as the SIGMET/AIRMET message is being cancelled).

Note.—In accordance with 1.1.5 and 2.1.5, severe or moderate icing and severe or moderate turbulence (SEV ICE, MOD ICE, SEV TURB, MOD TURB) associated with thunderstorms, cumulonimbus clouds or tropical cyclones should not be included.

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