International Civil Aviation Organization

MID OPMET Bulletin Management Group
First Meeting (MID OPMET BMG/1)

(Cairo, Egypt 18 December 2011)

Agenda Items 2-8

SECRETARIAT PAPER OF MID OPMET BMG/1

(Presented by the Secretariat)

SUMMARY

A status of Annex 3 implementation issues related to the exchange of OPMET data in the MID Region with respect to issues identified in the MID MET SG/2 meeting is provided in this paper.

REFERENCES

- *MID FASID*

1. INTRODUCTION

1.1 The Secretariat welcomes the first meeting of the MID OPMET Bulletin Management Group (MID OPMET BMG/1), recalling that the MIDANPIRG/12 meeting requested this group be activated and proposed a meeting be convened (MIDANPIRG/12 Conclusion 12/69 refers). The improvement in providing OPMET data in the MID Region would be realized by operators in optimizing their flights to reduce time, fuel, carbon emissions and cost. These benefits would be realized in many regions as the MID Region is an important link from Europe/Africa and Asia/Pacific and with use of long haul-flights, the Americas. Therefore, regional improvements to the exchange of OPMET data in the MID Region have global benefits.

1.2 This meeting is expected to review documentation associated with OPMET exchange such as the MID Air Navigation Plan Volume II (FASID) Part VI (MET) and MID SIGMET Guide. Furthermore, the meeting is expected to consider the development of a Regional OPMET Bulletin Exchange (ROBEX) Handbook including procedures and processes for the monitoring, management, quality control and backing-up of MID OPMET bulletins. A status report of Regional OPMET Data Banks and/or Regional OPMET Centres is expected by those States having accepted this responsibility. Inter-regional exchange and transmission of OPMET information to SADIS, including new requirements will also be discussed.

2. DISCUSSIONS

World Area Forecast System

2.1 The meeting is invited to review the Terms of Reference of the MID OPMET Bulletin Management Group (BMG) as provided in **Appendix A** to this working paper to recall the duties of the group. The ToRs will be re-examined at the end of the meeting in case there are any suggested changes to be proposed to the MID MET SG/3 meeting.

OPMET availability, regularity, and timeliness

2.2 The BMG/1 meeting may recall the MET SG/2 initiative to improve the quality, availability, timeliness and regularity of OPMET data in the MID Region is ongoing (Draft Conclusions 2/7 and 2/8 refer; MIDANPIRG Conclusions 12/67 and 12/68 refer) noting that State letters have been issued on 14 December 2010 to improve the quality and availability of OPMET data in the MID Region by

- implementing ICAO Annex 3 provisions relating to OPMET data, including TAF; and
- investigating the reasons for the absence of SIGMET messages and reconsider their procedures for SIGMET generation and transmission; and
- considering the need for establishing local quality control and format verification procedures for OPMET data; and
- undertaking all efforts to reduce the errors in OPMET data significantly, the aim of which should be less than 5% of all issued OPMET data being incorrect.

2.3 The BMG/1 meeting may contribute in reformulating a Draft Conclusion that is based on results of OPMET monitoring (e.g. from EUR Data Management Group (DMG) and/or IATA) for consideration at the MID MET SG/3 meeting. The BMG/1 meeting may consider any progress provided on implementation of 30-hour TAF requirements for 3 aerodromes in Iran (OIFM, OISS, OITT), 1 aerodrome in Jordan (OJAI) (not listed in list of deficiencies), and 1 aerodrome in Syria (OSDI) as well as implementation of 24-hour TAF for 2 aerodromes in Syria (OSAP and OSLK). The meeting may also consider progress related to one TAF valid at any aerodrome at any time (Amendment 74 to Annex 3) for Jordan and Syria (2 TAF were observed to be issued at some aerodromes) and Saudi Arabia (short or long TAF were issued depending on the time of day).

2.4 Furthermore, in order to improve the timeliness and regularity of OPMET data (METAR and TAF) for AOP aerodromes in the MID Region, the ICAO MID Regional Office developed guidance material related to the issuance of OPMET data as attached to State letter (Ref.: AN 10/11-10-426) issued on 14 December 2010. If the BMG/1 meeting determines that further guidance is needed, the BMG/1 meeting may wish to contribute in formulating a Draft Conclusion using an excerpt from the APAC ROBEX Handbook modified further based on recent discussions between the SADIS Gateway and Inter-Regional OPMET Gateway (IROG) Singapore as provided in **Appendix B** to this working paper. Given the above issues relating to OPMET data, the meeting may wish to contribute in formulating a Draft Conclusion for the MID MET SG/3 meeting.

DRAFT CONCLUSION 3/XX — OPMET DATA IMPROVEMENTS

That, the ICAO Regional Director, Middle East, undertake the necessary action to notify States of:

a) AOP aerodromes whose OPMET data are missing, untimely, or contain format errors; and

b) procedures in the issuance of OPMET data as per **Appendix B** to this working paper

Regional Air Navigation Plan

2.5 The BMG/1 meeting may recall the use of the Regional Air Navigation Plan and the importance of a routine review since the requirements are evolving, information in the FASID tables can be used as the basis of 1) cost recovery, 2) measuring implementation of requirements (e.g. OPMET monitoring) that assists in identifying where improvements need to be made, and 3) regional planning by some stakeholders.

2.6 The BMG/1 meeting may recall the MET SG/2 initiative that proposed an amendment to Part VI (MET) of the MID Air Navigation Plan Volume I and Volume II (MID Doc 9708) (MET SG/2 Draft Conclusions 2/9 and 2/10 a) refer) which commenced in April 2010. This amendment aligned regional procedures with the International Airways Volcano Watch (IAVW) and World Area Forecast System (WAFS) with global provisions as well as amended Table MET 1A of Part VI (MET) of the MID ANP Volume II (FASID) to reflect regional requirements for 24- and 30-hour Aerodrome Forecasts (TAF) in the MID Region.

2.7 Furthermore, the BMG/1 meeting may recall the MET SG/2 initiative to review Part VI (MET) of the MID Air Navigation Plan Volume II (FASID) in time for the MET SG/3 meeting noting that FASID Tables MET 2A, 2C, 4A and 4B related to OPMET exchange in coordination with the MID OPMET Bulletin Management Group (MET SG/2 Draft Decision 2/10 & MIDANPIRG Conclusion 12/73 refer). This initiative was expected to be considered at the first meeting of the MID OPMET Bulleting Management Group (MID OPMET BMG/1) to be held on 18 December 2011 (MET SG/2 Draft Conclusion 2/14 & MIDANPIRG Conclusion 12/69 refer). The BMG/1 meeting is invited to consider including proposed changes to FASID Tables MET 2A, 2C, 4A and 4B for consideration at the MID MET SG/3 meeting. The FASID Tables are posted at the following URL for the meetings consideration: http://legacy.icao.int/MID/2011/MET_SG_3/index.html

Deficiencies

2.8 The BMG/1 meeting will recall the MIDANPIRG Air Navigation Deficiency Database which contains a list of deficiencies that includes MET. The MIDANPIRG/12 meeting added deficiencies in the MET field for the reception of OPMET data at Regional OPMET Centre (ROC) Vienna from Iraq noting AFTN was not yet available (however, RODB Singapore would be able to forward OPMET from Iraq to Vienna if the OPMET were sent by email to RODB Singapore); implementation of 30-hour TAF as per the RANP for Iran (OIFM, OISS and OITT) and 24- or 30-hour TAF for Syria (OSAP-24 hour, OSDI-30 hour, and OSLK-24 hour). Any progress with reference to these or other deficiencies in the MET field could be considered by the MET SG/3 meeting in formulating a Draft Conclusion to remove or add deficiencies to the MIDANPIRG Air Navigation Deficiency Database as provided in **Appendix C** to this working paper.

MID SIGMET Guide

2.9 Another ongoing initiative developed by the MET SG/2 meeting pertains to finalizing the MID SIGMET Guide (MET SG/2 Draft Conclusion 2/6 refers). The BMG/1 meeting may recall that the working draft was circulated to States in January 2010 and finalized in December 2010 through MIDANPIRG Conclusion 12/66. Since that time, the WMO Abbreviated Header Line for SIGMET for Saudi Arabia was received and included in the draft MID SIGMET Guide as provided in **Appendix D** to this working paper. The meeting may note that only two entries have been completed and States strongly encouraged to provide this information. Given the above, the BMG/1 meeting may wish to provide the WMO Abbreviated Header Line for SIGMET for their State for presentation at the MID MET SG/3 meeting.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) provide WMO AHL for SIGMET for finalizing the SIGMET Guide;

b) provide a status on OPMET deficiencies and if they still exist, an implementation date;

c) provide input to the FASID tables related to OPMET; and

d) review the ToRs and propose changes to the MID MET SG/3 meeting, if necessary.

APPENDIX A

TERMS OF REFERENCE OF THE MID OPMET BULLETIN MANAGEMENT GROUP (MID OPMET BMG)

1. Terms of Reference

a) Review the OPMET exchange schemes in the MID Region and develop proposals for their optimization taking into account the current trends in the global OPMET exchange;

b) Develop monitoring and management procedures related to the ROBEX exchange and other exchanges of OPMET information;

c) Keep up-to-date the regional guidance material related to OPMET exchange;

d) Liaise with similar groups in the adjacent ICAO Regions in order to ensure harmonized and seamless OPMET exchange; and

e) The group will report to the MET Sub-Group of MIDANPIRG.

2. Work Programme

The work to be addressed by the MID OPMET BMG includes:

a) examine the existing requirements and any new requirements for the OPMET exchange in MID Region and to assess the feasibility of satisfying these requirements, taking into account the availability of the data;

b) review the ROBEX scheme and other OPMET exchange schemes and prepare proposal for updating and optimizing of the schemes;

c) review and update the procedures for interregional exchange and for transmission of the regional OPMET data to SADIS;

d) review and amend the regional guidance materials on the OPMET exchange and include procedures for the exchange of all required OPMET message types: SA, SP, FC, FT, WS, WC, WV, FK, FV, UA;

e) develop procedures for monitoring and management of the OPMET information, based on similar procedures used in the EUR and APAC Regions; and

f) provide regular progress reports to MET SG meetings.

3. Composition

a) The OPMET/BMG is composed by experts from Egypt, Iran, Kuwait and Oman (Rapporteur). Bahrain, Saudi Arabia and UAE are also expected to participate in the activity of the Group; and

b) Experts from the EUR OPMET Data Management Group (DMG), the VAAC Toulouse, APAC OPMET/M Task Force and IATA are invited to participate in the work of the MID OPMET BMG.

4. Working Arrangements

It is expected that most of the work of the group will be conducted via correspondence by fax, e-mail or telephone. The group should establish a network of OPMET focal points at all MID COM/MET centres dealing with OPMET data. When necessary, the Rapporteur, in coordination with the Regional Office, Cairo, will call teleconferences or meetings to discuss important issues.

APPENDIX B

7.5 Summary of OPMET data issuance

7.5.1 In response to APANPIRG/20 Conclusion 20/62, a summary of correct methods of issuing OPMET data are provided in the following two tables (adapted further with input provided by Regional OPMET Data Bank Singapore – highlighted in yellow)

METAR observation, compiling and filing

Function	Responsible Entity	Explanation of Time	Time of task (min)
METAR Observation	Originating stations (AMS, AMO, forecast office, MWO, TCAC, VAAC)	State determines how often and when (emphasis on consistency, i.e. 50 minutes past the hour every hour every day) **Examples : HH+00, HH+30, HH+10, HH+50** Note that the observation time is used in the METAR report	0
Send METAR observation to NOC	Orig station		
Send METAR observations to ROBEX Centre	NOC		
Bulletin compiling and filing	ROBEX Bulletin Compiling Centre	Up to 5 minutes after actual time of observation (ref.: Annex 3, App. 10, 2.1.2) Note that the observation time of the METAR is used in the DTG – YYGGgg of the bulletin header Note that the filing time is used in the AFTN header and should be up to 5 minutes after the observation time given in the bulletin header also referred to as the WMO Abbreviated Heading in the ROBEX HB	<5
Send METAR bulletin to: ROBEX Centres (predefined distribution list) RODBs NOCs Other MET offices	ROBEX Centre *via AFTN*	Up to 5 minutes (10 minutes for distances greater than 900 km) (ref.: Annex 3, App. 10, 1.1)	<5 (<10 for distances > 900 km)
Acceptable time from observation at originating stations to reception by user			<10 (<15 mins for distances > 900 km)

TAF issuance, compiling and filing

Function	Responsible Entity	Explanation of Time	Time of task (min)
TAF Issuance	AMO or NOC	State determines time of 4 scheduled TAFs (emphasis on consistency, i.e. 00, 06, 12, 18Z every day) Note that issuance time of TAF (which is one hour before the start period of validity of the TAF) is used in the date/time group (DTG) (YYGGggZ) of TAF messages TAF is sent to ROBEX Centre before the cutoff time of accepting TAF for filing one hour before the start period of validity time (typically 15 minutes before filing)	(allow enough time to reach ROBEX Centre before cutoff time – typically 15 minutes before the filing time or one-hour and 15 minutes before the start period of validity) Ex: TAF to be valid at 0600 is sent to ROBEX Centre by 0445
Bulletin compiling and filing	ROBEX Centre	Bulletins are compiled during the 15 minutes before filing Note that the TAF issuance time (official filing time) is used in the DTG – YYGGgg of the bulletin header Note that the actual filing time is used in the AFTN header and should be after the time given in the bulletin header also referred to as the WMO Abbreviated Heading in the ROBEX HB TAF should be filed for transmission at least one hour before the commencement of their period of validity, unless otherwise determined by regional air navigation agreement. (ref.: Annex 3, App. 10, 2.1.2)	<15 Ex: TAF bulletin compiled between 0445 and 0500 and filed for transmission
Send TAF bulletin to: ROBEX Centres (predefined distribution list) RODBs NOCs Other MET offices	ROBEX Centre *via AFTN*	Up to 5 minutes (10 minutes for distances greater than 900 km) (ref.: Annex 3, App. 10, 1.1)	<5 (<10 for distances > 900 km)
Acceptable time for ROBEX BCC compiling and filing to reception by user			<20 (<25 for distances > 900 km)

APPENDIX C
MID MET DEFICIENCIES

Total Number of Deficiencies is: 3

Deficiencies in the MET field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completetion	Priority for action
1	Annex 3 Chapter 6 Para 6.2.6. MID ANP Doc 9706 Volume I (Basic ANP) Part VI (MET) Para 9.	Provision of 30-hour aerodrome forecasts (TAF)	No international exchange requirement for 18-hour validity long-TAF in the MID Region. Only 30-hour validity long-TAF should be available internationally for OIFM, OISS and OITT.	Dec 2009	Follow-up of MIDANPIRG METSG/2 report. State Letter ME 3/56.14-10/091 issued 15 March 2010.	F H O	Only 30-hour validity long-TAF should be available internationally for OIFM, OISS and OITT. Availability of 18-hour long-TAF for these aerodromes should cease.	Iran	Dec 2010	A

MID MET DEFICIENCIES

Deficiencies in the MET field IRAQ										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completetion**	**Priority for action**
1	Annex 3, App. 3, 3.1 and App. 5, 1.6	Provision of OPMET data (METAR and TAF) to international OPMET data banks	OPMET data not available at Vienna RODB	Jun 2008	-	FHO	-	Iraq	Dec 2011	A

MID MET DEFICIENCIES

Deficiencies in the MET field SYRIA										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completetion**	**Priority for action**
1	Annex 3 Chapter 6 Para 6.2.6. MID ANP Doc 9706 Volume I (Basic ANP) Part VI (MET) Para 9.	Provision of 24- or 30-hour aerodrome forecasts (TAF)	No international exchange requirement for 9-hour validity short-TAF or 18-hour long-TAF. Only 24- or 30-hour validity long-TAF should be exchanged internationally.	Dec 2009	Follow-up of MIDANPIRG METSG/2 report. State Letter ME 3/56.14-10/093 issued 15 March 2010.	F H O	Only 24- or 30-hour long-TAF should be available internationally for OSAP, OSDI and OSLK. Availability of 9-hour short-TAF or 18-hour long-TAF for these aerodromes should cease.	Syria	Dec 2010	A

-END-

APPENDIX D

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Working Draft of the

MID SIGMET GUIDE

FIRST EDITION
October 2010

PREPARED BY THE MIDDLE EAST OFFICE OF ICAO

First Edition
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RECORD OF AMENDMENTS AND CORRIGENDA

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PART 1. INTRODUCTION

1.1 The main purpose of this document is to provide guidance for standardization and harmonization of the procedures and formats related to the occurrence or expected occurrence of specified hazardous en-route weather conditions which may affect the safety of aircraft and low-level aircraft operations, known as SIGMET information. The guidance is complementary to the Annex 3 standards and recommended practices (SARPS) regarding SIGMET, and to the SIGMET related provisions of the MID ANP/FASID (ICAO Doc 9708).

1.2 In respect of SIGMET messages, this document includes guidance concerning SIGMET messages for significant en-route weather phenomena, volcanic ash and tropical cyclone SIGMET messages.

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

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapter 3, paragraphs 3.4 – 3.7, Chapter 7, paragraphs 7.1 – 7.2, and Part II, Appendix 6.

- MID Basic ANP, Part VI and FASID Table MET 1B , MET 2B, MET 3A and MET 3B.

- Annex 11 - *Air Traffic Services*, Chapter 4, paragraph 4.2.1 and Chapter 7, paragraph 7.1.

- PANS – *Air Traffic Management*, Doc 4444, Chapter 9, paragraph 9.1.3.2.

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

1.4 The SIGMET Guide is intended mainly to assist the meteorological watch offices (MWOs) in the MID Region in preparing and disseminating SIGMET information. It provides detailed information on the format of SIGMET messages as specified by Annex 3. The explanations of the format are accompanied by 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.

1.5 This document is prepared by the ICAO MID Regional Office. It should be reviewed and updated regularly in order to be kept in line with the ICAO SARPs and regional procedures. This first edition of the MID SIGMET Guide takes into account changes to SIGMET provisions resulting from the applicability of Amendment 75 to Annex 3 on 18 November 2010.

PART 2. RESPONSIBILITIES AND COORDINATION

2.1 General

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

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

2.1.3 As seen from the above, the SIGMET service involves MET, ATS and pilots. In order for the SIGMET service to be effective, close coordination between these parties, as well as mutual understanding of the needs and responsibilities, should be maintained.

2.1.4 For the special case of SIGMET for volcanic ash, the MWOs are provided with advisories from the volcanic ash advisory centres (VAAC) designated in the Regional ANP.

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

2.1.6 In the next paragraphs, the main responsibilities and coordination links between MET, ATS and pilots are described.

2.2 Meteorological Watch Office – responsibilities and procedures related to SIGMET

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

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

2.2.3 All designated MWOs in the MID Region are listed in the FASID Table MET 1B of the MID FASID.

2.2.4 If, for some reason, a MWO is not able to meet its obligations, including the provision of SIGMET, arrangements have to be made by the meteorological authority concerned, that another MWO takes over these responsibilities for a certain period of time. Such delegation of responsibilities has to be notified by a NOTAM and a letter to the ICAO Regional Office.

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

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

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

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

a) issue the corresponding SIGMET information; or

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

2.2.9 Appropriate telecommunication means have to be available at the MWO in order to ensure timely dissemination of SIGMETs according to a dissemination scheme, which includes transmission to:

- local ATS users;
- aeronautical MET offices within the AOR;
- other MWOs concerned (it should be ensured that SIGMET is sent to all MWOs whose AORs are, at least partly, within the 925 km (500 NM) range from the reported phenomenon);
- centres designated for transmission of VOLMET or D-VOLMET where SIGMET is required for transmission;
- the responsible Regional OPMET Centres (ROC) and international OPMET data banks (it should be arranged through the EUR RODEX scheme, that SIGMETs are sent to the designated OPMET data banks in other ICAO Regions, to the WAFCs and to the uplink stations of SADIS and ISCS);
- responsible TCAC or VAAC (if applicable) according to FASID Table MET 3A and MET 3B respectively; and

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

2.3 Responsibilities of ATS units

2.3.1 Close coordination should be established between the MWO and the corresponding ATS unit (ACC or FIC), including arrangements 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 neighbouring FIRs /ACCs if these SIGMETs are required according to paragraph 2.3.4 below ; and

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

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

2.3.3 SIGMET information passed to aircraft should cover a portion of the route up to a flying time of two hours ahead of the aircraft.

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 their AOR up to a flying time of two hours ahead of the current position of the aircraft. If this is the case, the controllers should transmit the SIGMET promptly to the aircraft-in-flight likely to be affected.

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

2.4 Responsibilities of pilots

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

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

2.5 Coordination between MWOs and the VAACs and TCACs

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

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

2.5.3 Information regarding the VAACs and TCACs serving the MID Region with their corresponding areas of responsibility and lists of MWOs to which advisories are to be sent is provided in the MET FASID Tables MET 3A and MET 3B.

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

PART 3. 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 A.**

3.1.2 The increasing use of automated systems for handling 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, the structure and format of the SIGMET message, as specified in Annex 3, Part II, Appendix 6, should be followed strictly by the MWOs. Appendix 6 provides detailed information regarding the content and order of elements in the SIGMET message.

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

3.1.4 After issuing a SIGMET, the MWO maintain watch over the evolution of the phenomenon for which the SIGMET has been issued and issue a new updated SIGMET when necessary. VA SIGMETs have to be updated at least every 6 hours.

3.1.5 SIGMETs 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 has to 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 volcanic ash or tropical cyclones (this includes: TS, TURB, ICE, MTW, DS and SS); this SIGMET will be referred as WS SIGMET;
- SIGMET for volcanic ash (VA SIGMET) (to be referred also as WV SIGMET)
- SIGMET for tropical cyclones (TC SIGMET (to be referred also as WC SIGMET)).

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

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;

3.3.2 The first two parts of the SIGMET message are common for all types of SIGMETs. The content and format of the meteorological part is different depending on the type of SIGMET. Therefore, in the following paragraphs, the meteorological part of the WS, WV and WC types of SIGMET is 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

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 **WV** – for SIGMET for volcanic ash **WC** – for SIGMET for tropical cyclone
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 paragraph 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 centre which disseminates the message).

3.4.1.4 It is recommended to assign a unique WMO header for each SIGMET bulletin per FIR, CTA or UIR. The distinction between different SIGMET bulletins issued by the State's MWOs should be through the respective data type designator (T_1T_2) and bulletin number (ii**).**

Examples (fictitious AHL):

WSOM50 OOMS 231100
WVOM50 OOMS 011400
WCOM50 OOMS 161700

Note: A table with WMO SIGMET headers used by the MID Meteorological Watch Offices is included in ***Appendix B***

3.4.2 First line of SIGMET

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

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

CCCC	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers
SIGMET	Message identifier
[nn]n	Daily sequence number (see paragraph 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 paragraph 3.4.2.3)
CCCC-	ICAO location indicator of the MWO originating the message and – (hyphen, without space, to separate the preamble from the text)

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

- 1, 2, …
- 01, 02, …
- A01, A02, …

Examples:

OOMM SIGMET 1 VALID 121100/121500 OOMS-
OEJD SIGMET 01 VALID 231300/231700 OEJD-

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

Note 2: Correct numbering of SIGMET is very important since the number is used for reference in the communication between ATC and pilots and in VOLMET and D-VOLMET.

3.4.2.3 The following has to be considered when determining the validity period:

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

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

Examples:

1. SIGMET for an observed phenomenon:

WSSD20 OEJD 231300
OEJD SIGMET 01 VALID 231300/231700 OEJD-

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

WSSD20 OEJD 231300
OEJD SIGMET 01 VALID 231530/231930 OEJD-

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

3.4.3.1 The meteorological part of a SIGMET consists of eight elements as shown in the table below.

Start of the second line of the message

1	2	3	4	5	6
Location indicator of the FIR/UIR or CTA	Name of the FIR or UIR or FIR/UIR or CTA	Description of the phenomenon	Observed or forecast	Location	Level
<CCCC>	<name> FIR [UIR, FIR/UIR, CTA]	<Phenomenon>	OBS [AT <GGggZ>] or FCST [AT <GGggZ>]	Geographical location of the phenomenon given by coordinates, or geographical objects, or location indicators	FL<nnn/nnn> or [SFC/]FL<nnn> or [SFC/]<nnnn>M or [SFC/]<nnnn>FT or TOP FL<nnn> or [TOP] ABV FL<nnn>

7	8
Movement or expected movement	Changes in intensity
MOV <direction, speed> KMH[KT], or STNR	INTSF or WKN or NC

3.4.3.1.1 Location indicator and name of the FIR, UIR, FIR/UIR or CTA

location indicator <name> FIR
or
location indicator <name> UIR
or
location indictor <name> FIR/UIR
or
location indicator <name> CTA

Example:

OOMM MUSCAT FIR

3.4.3.1.2 Phenomenon

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. SIGMET shall be issued only for the following phenomena (with only one phenomenon in each SIGMET):

at cruising levels (irrespective of altitude):

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

The appropriate abbreviations and combinations thereof, and their meaning are given in **Appendix C**.

3.4.3.1.3 Indication if the phenomenon is observed or forecast

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

The indication whether the information is observed or forecast is given by the abbreviations OBS and FCST. OBS and FCST are optionally followed by a time group in the form AT GGggZ, where GGgg is the time of the observation or forecast in hours and minutes UTC. If the exact time of the observation or forecast is not known the time is not included.

Examples:

OBS AT 0140Z
FCST AT 0200Z

3.4.3.1.4 Location of the phenomenon

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

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

- Indication of a part of the FIR with reference to latitude:
  N OF or S OF <Nnn[nn]> or <Snn[nn]>

- indication of a part of the FIR with reference to a longitude:
  E OF or W OF <Ennn[nn]> or <Wnnn[nn]>

- indication of a part of the FIR with reference to a latitude and longitude:
  any combination of the above two cases;

- with reference to a location with ICAO location indicator CCCC (normally, this should be the case in a SIGMET based on a special air-report in which the reported phenomenon is given with reference to an airport or another object with an ICAO location indicator CCCC), or

- with reference to geographical features well known internationally.

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

3.4.3.1.5 Flight level or altitude and extent

[SFC/]FL<nnn>
or FL<nnn/nnn>
or [SFC/]<nnnn>M
or [SFC/]<nnnn>FT
or TOP FL<nnn>
or [TOP] ABV 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 of a layer – **SFC/FL<nnn>, SFC/<nnnn>M, or SFC/<nnnn>FT**, where the lower level is the surface and the upper level is a flight level, an altitude in metres or an altitude in feet respectively;
- reporting a layer using flight levels – **FL<nnn/nnn>**, where the lower flight level is reported first; this is used particularly in reporting turbulence and icing;
- reporting the top of a phenomenon with reference to one flight level – **TOP FL<nnn>;**
- reporting a phenomenon with reference to one flight level and the abbreviation ABV – **ABV FL<nnn>;**
- reporting the top of a phenomenon with reference to one flight level and the abbreviation ABV – **TOP ABV FL<nnn>;**

Examples:

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

3.4.3.1.6 Movement

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

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

Examples:

MOV NW 30KMH
MOV NNW 30KMH
MOV E 25KT

3.4.3.1.7 Expected changes in intensity

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

INTSF – intensifying
WKN – weakening
NC – no change

3.4.4 Structure of the meteorological part of VA SIGMET

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

Start of the second line of the message

1	2	3		4
Location indicator of the FIR/UIR or CTA	Name of the FIR or UIR or FIR/UIR or CTA	Volcano		Volcanic ash cloud
		Name	Location	
<CCCC>	<name> FIR [UIR, FIR/UIR, CTA]	[VA ERUPTION] [MT <name>]	[PSN <position>]	VA CLD OBS [AT <GGggZ>] or VA CLD FCST [AT GGggZ]

5			6
Extent of the cloud			Expected movement
Location	Vertical	Horizontal	
Location (referring to latitude and longitude (in degrees and minutes) or locations or geographic features well known internationally)	FL<nnn/nnn>	[APRX <nnn>KM BY <nnn>KM] or [APRX <nnn>NM BY <nnn>NM]	MOV <direction> <speed>

7	
Volcanic ash cloud forecast at the end of the period of validity	
FCST time	Position
FCST <GGggZ>	VA CLD APRX <lat,lon> - <lat,lon> - …

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

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

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

- the term **VA 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. the position of the volcano is given by the abbreviation **PSN**, followed by the latitude and longitude in degrees and minutes, e.g. **PSN N3520 E09040**
- this section of the message ends with the abbreviation **VA CLD** – volcanic ash cloud.

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

3.4.4.3 Time of VA CLD observation or forecast

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

The time of observation is taken from the source of the observation – satellite image, special air- report, report from a ground volcano logical 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 be issued, and the abbreviation VA CLD FCST [AT <GGgg>Z] shall be used.

Examples:

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

3.4.4.4 Level and extent of the volcanic ash cloud

<P1(lat,lon) - P2(lat,lon) - … > FL<nnn/nnn> [APRX <nnn>KM BY <nnn>KM] or
<P1(lat,lon) - P2(lat,lon) - … > FL<nnn/nnn> [APRX <nnn>NM BY <nnn>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 be separated by hyphen
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

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

Examples:

N0100 E09530 – N1215 E11045 FL100/180 APRX 10KM BY 50KM

S0530 E09300 – N0100 E09530 – N1215 E11045 FL 150/210

3.4.4.5 Movement or expected movement of the VA cloud

MOV <direction> <speed>

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

Examples:

MOV E 35 KMH
MOV SSW 20 KT
STNR

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

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 APRX <P1(lat,lon) - P2(lat,lon) - … >

3.4.4.6.1 The **GGggZ** group should indicate the end of the 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.

3.4.4.6.2 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 changes with height which causes the VA cloud to spread into different directions at different heights.

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		5
Location indicator of the FIR/UIR or CTA	Name of the FIR or UIR or FIR/UIR or CTA	TC name	Observed or forecast		Extent
			Time	Location of TC centre	
<CCCC>	<name> FIR [UIR, FIR/UIR, CTA]	TC <name> or TC NN	OBS [AT <GGgg>Z] or FCST [AT <GGgg>Z]	<lat,lon>	CB TOP [ABV or BLW] FL<nnn> WI <nnn> KM[NM] OF CENTRE

6	7	8
Expected movement	Intensity change	Forecast of the centre position at the end of the validity period
MOV <direction> <speed> KMH[KT] or STNR	INTSF or WKN or NC	FCST <GGgg>Z TC CENTRE <lat,lon>

3.4.5.2 Name of the tropical cyclone

TC <name>
TC NN

Note: NN used for unnamed tropical cyclones.

The description of the tropical cyclone consists of the abbreviation TC followed by the international name of the tropical cyclone given by the corresponding WMO RSMC. If the TC has not yet been given a name, the abbreviation NN shall be used.

Examples:

TC GLORIA
TC 04B
TC NN

3.4.5.3 Time of observation or indication of forecast

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

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

Examples:
OBS AT 2330Z
FCST AT 1400Z

3.4.5.4 Location of the TC centre

<location>

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

Examples:

N1535 E14230

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

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

Examples:

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

3.4.5.6 Movement or expected movement

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

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

Examples:

MOV NW 30KMH
MOV NNW 30KMH
MOV E 25KT

3.4.5.7 Intensity change

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

INTSF – intensifying
WKN – weakening
NC – no change

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

FCST <GGgg>Z TC CENTRE <location>

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

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

Examples:

FCST 1200Z TC CENTRE N1430 E12800

3.4.6 ***Cancellation of SIGMET***

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

- WMO heading with the same data type designator;
- first line, including the next sequence number followed by a new validity period, and
- second line, which contains the location indicator and name of the FIR or CTA, the combination CNL SIGMET, followed by the sequential number of the original SIGMET and its validity period.

Examples:

1. Cancellation of a WS or WC SIGMET 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 131515/132115 YUSO-
YUDD SHANLON FIR …

Cancellation SIGMET:

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

APPENDIX A

List of the abbreviations and decode used in SIGMET

Abbreviation	Decode
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
EMBD	Embedded in layer *(to indicate CB embedded in layers of other clouds)*
ENE	East-Northeast
ERUPTION*	Eruption *(used to indicate volcanic eruption)*
ESE	East=Southeast
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	Kilometres
KMH	Kilometres per hour
KT	Knots
LINE	Line
MOD	Moderate *(used to indicate intensity of weather phenomena)*
MOV	Move *or* moving *or* movement
MPS	Metres per second
MT	Mountain
MTW	Mountain waves
N	North *or* northern latitude
NC	No change
NE	North-east
NM	Nautical miles
NNE	North-Northeast
NNW	North-Northwest
NW	North-west
OBS	Observe *or* observed *or* observation
OBSC	Obscure *or* obscured *or* obscuring
OCNL	Occasional *or* occasionally
OF*	Of … *(place)*
PSN	Position
RA	Rain
RDOACT*	Radioactive

Abbreviation	Decode
S	South *or* southern latitude
SE	South-east
SEV	Severe *(used e.g. to qualify icing and turbulence reports)*
SIGMET	Information concerning en-route weather phenomena which may affect the safety of aircraft operations
SQL	Squall line
SS	Sandstorm
SSE	South-Southeast
SSW	South-Southwest
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
WID	Width
WNW	West-Northwest
WSW	West-Southwest
Z	Coordinated Universal Time *(used in meteorological messages)*

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

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APPENDIX B

List of MID SIGMET (WS, WV and WC) headers

State	MWO name (Doc 7910)	MWO Loc. Ind.	WS AHL	WV AHL	WC AHL	FIR Name (Doc 7910)	FIR Loc. Ind.	ATSU serving the FIR
BAHRAIN	BAHRAIN INTERNATIONAL	OBBI	WS[AAii] [CCCC]	WV[AAii] [CCCC]	WC[AAii] [CCCC]	BAHRAIN	OBBB	OBBB
EGYPT	CAIRO/INTL	HECA	WS[AAii] [CCCC]	WV[AAii] [CCCC]	N/A	CAIRO	HECC	HECC
IRAN (ISLAMIC REPUBLIC OF)	TEHRAN/MEHRABAD INTL	OIII	WS[AAii] [CCCC]	WV[AAii] [CCCC]	WC[AAii] [CCCC]	TEHRAN	OIIX	OIIX
IRAQ	BAGHDAD INTERNATIONAL AIRPORT	ORBI	WS[AAii] [CCCC]	WV[AAii] [CCCC]	N/A	BAGHDAD	ORBB	ORBS
~~ISRAEL~~	~~TEL AVIV/BEN GURION AIRPORT~~	~~LLBG~~	~~WS[AAii] [CCCC]~~	~~WV[AAii] [CCCC]~~	~~N/A~~	~~TEL AVIV~~	~~LLLL~~	~~LLAD~~
JORDAN	AMMAN/QUEEN ALIA	OJAI	WS[AAii] [CCCC]	WV[AAii] [CCCC]	N/A	AMMAN	OJAC	OJAC
KUWAIT	KUWAIT/INTL AIRPORT	OKBK	WSKW10 OKBK	WVKW10 OKBK	WCKW10 OKBK	KUWAIT	OKAC	OKAC
LEBANON	BEIRUT/BEIRUT INTL	OLBA	WS[AAii] [CCCC]	WV[AAii] [CCCC]	N/A	BEIRUT	OLBB	OLBA
OMAN	MUSCAT/SEEB INTL	OOMS	WS[AAii] [CCCC]	WV[AAii] [CCCC]	WC[AAii] [CCCC]	MUSCAT	OOMM	OOMM
SAUDI ARABIA	JEDDAH/KING ABDULAZIZ INTL	OEJN	WSSD20 OEJD	WVSD20 OEJD	WCSD20 OEJD	JEDDAH	OEJD	OEJD
SYRIAN ARAB REPUBLIC	DAMASCUS/INTL	OSDI	WS[AAii] [CCCC]	WV[AAii] [CCCC]	N/A	DAMASCUS	OSTT	OSDI
UNITED ARAB EMIRATES	ABU DHABI INTERNATIONAL	OMAA	WS[AAii] [CCCC]	WV[AAii] [CCCC]	WC[AAii] [CCCC]	EMIRATES	OMAE	OMAE
YEMEN	SANAA/INTL	OYSN	WS[AAii] [CCCC]	WV[AAii] [CCCC]	WC[AAii] [CCCC]	SANAA	OYSC	OYSN

Note 1: Qatar is not indicated in the above table, since it has no FIR area if responsibility.

Note 2: The AHL for each of the WS, WV and WC SIGMETs (highlighted above) is to be completed based on information provided by the State(s) concerned following consultation.

APPENDIX C

Meteorological phenomena to be reported by SIGMET

Phenomenon	Description	Meaning
Thunderstorm (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
Tropical cyclone (TC)	TC (+ TC name)	Tropical cyclone (+ TC name)
Turbulence (TURB)	SEV TURB[6]	Severe turbulence
Icing (ICE)	SEV ICE SEV ICE (FZRA)	Severe icing Severe icing due to freezing rain
Mountain wave (MTW)	SEV MTW[7]	Severe mountain wave
Duststorm (DS)	HVY DS	Heavy duststorm
Sandstorm (SS)	HVY SS	Heavy sandstorm
Volcanic ash cloud (VA)	VA (+ volcano name, if known)	Volcanic ash (+ volcano name)
Radioactive cloud	RDOACT CLD	Radioactive cloud

Notes:

1. Only one of the weather phenomena listed should be selected and included in each SIGMET

*2. Obscured (**OBSC**) indicates that the thunderstorm is obscured by haze or smoke or cannot be readily seen due to darkness*

*3. Embedded (**EMBD**) – indicates that the thunderstorm is embedded within cloud layers and cannot be readily recognized*

*4. Frequent (**FRQ**) indicates an area of thunderstorms within which there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75% of the area affected, or forecasts to be affected, by the phenomenon (at a fixed time or during the period of validity)*

*5. Squall line (**SQL**) indicates thunderstorms along a line with little or no space between individual clouds*

*6. Severe (**SEV**) turbulence (**TURB**) refers only to:*
- *low-level turbulence associated with strong surface winds;*
- *rotor streaming;*
- *turbulence whether in cloud or not in cloud (CAT) near to jet streams.*
- *Turbulence is considered severe whenever the peak value of the cube root of the eddy dissipation rate (EDR) exceeds 0.7.*

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

APPENDIX D

Guidelines for reporting geographical coordinates in SIGMET

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

1. Each point is represented by 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 latitude, longitude coordinates 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

Note1: It is not necessary to repeat the first point when describing a polygon.

Note 2: In the case of the same phenomenon covering more than one area within the FIR, these elements may be repeated, as necessary.

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