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EUR SIGMET AND AIRMET GUIDE

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PREPARED BY THE EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO

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RECORD OF AMENDMENTS AND CORRIGENDA

Amendments			
No.	Date of issue	Date entered	Entered by
1	5 July 2011	5 July 2011	RO MET
2	24 Nov 2011	24 Nov 2011	RO MET
3	15 Feb 2013	15 Feb 2013	RO MET
4	3 Jan 2014	3 Jan 2014	RO MET (align w/ Am76 to Annex 3)
5	11 Feb 2014	11 Feb 2014	MET – Update App. B entries Norway
6	3 Nov 2014	3 Nov 2014	Update wmo ahl russe and ad-hoc METG changes (align w/ global template)
7	26 Oct 2015	26 Oct 2015	Non-controversial editorials. Identification of METWSG best practice guidance. Removal of 'UIR' on its own. Re-ordering of the methods by which spatial location of hazards should be provided – in accordance with IATA's preferences. Updated guidance regarding amending SIGMET/AIRMET. Updates to Appendix B and Appendix H (which includes examples of SIGMET for complex FIRs) as well as the inclusion of Appendix I that provides examples of special air-reports. Appendix F is now a link to SIGMET focal point contact information which was considered dynamic and could be updated more frequently.
8	27 Jul 2016	27 Jul 2016	Update WMO AHL for Finland, Germany, Italy, Russian Federation, Ukraine
9	31 Jan 2017	31 Jan 2017	Update for compliance with

Corrigenda			
No.	Date of issue	Date entered	Entered by

			Amendment 77 to ICAO Annex 3. Inclusion of 'Best Practice' procedures as agreed at METG/26				
10	21 Dec 2017	21 Dec 2017	Update for compliance with decisions taken at METG27				
11	29 Oct 2018	29 Oct 2018	Update WMO AHL for SIGMET for Russian Federation, Uzbekistan; compliance with Amendment 78 to ICAO Annex3; items from DMG/23 related to IWXXM; best practices provided by the SIGMET ad-hoc group; as well as proposals provided by the Netherlands				

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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 and AIRMET information. The guidance is complementary to the Annex 3 standards and recommended practices (SARPs) regarding SIGMET and AIRMET, and to the SIGMET and AIRMET related provisions of the EUR ANP/FASID (ICAO Doc 7754).

1.2 In respect of SIGMET messages, this document includes guidance for significant en-route weather phenomena and volcanic ash SIGMET messages. Guidance is also included for those EUR States with responsibility for issuing SIGMET messages for EUR/NAT FIRs that may be affected by tropical cyclone.

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.

- EUR eANP, Volume II Part V – Meteorology (MET), Table MET II-1.

- 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.

- EUR Regional Supplementary Procedures, Doc 7030, Part 1, paragraph 2.2.

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 AIRMET information is issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.

1.5 ICAO provisions concerning the issuance and dissemination of AIRMET information are contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapter 3 paragraph 3.4, Chapter 6 paragraph 6.5, Chapter 7 paragraphs 7.2, and Part II, Appendix 6.

- EUR eANP, Volume II, Part V – Meteorology (MET), Table MET II-1

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

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

Additional guidance on the AIRMET 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.

1.6 The SIGMET and AIRMET Guide is intended mainly to assist the MWOs in the EUR Region in preparing and disseminating SIGMET and AIRMET information. It provides detailed information on the

format of SIGMET and AIRMET 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 Air Traffic Service (ATS) units and the pilots, and their respective responsibilities.

1.7 This document is prepared by the ICAO EUR/NAT Regional Office and is published on the website at URL:
http://www.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> 014 – EUR SIGMET and AIRMET Guide). It should be reviewed and updated regularly in order to be kept in line with the ICAO SARPs and regional procedures. This amendment dated 31 January 2017 provides changes related to Amendment 77 to Annex 3 and includes SIGMET examples for tropical cyclone; guidance on cross-FIR coordination; use of speed of movement (use two digits for speed 09 or less); use of SEV TURB (instead of CAT); use of ENTIRE FIR for all SIGMET types; inclusion of guidance on vertical extent of phenomenon using altitudes (M, FT) in combination with FL depending on transition altitude; and expression of mid-night as dd0000. It also incorporates 'Best Practice' procedures as considered relevant to EUR MWOs/FIRs and as agreed at the METG/26 meeting (September 2016). Appendix J – Agreed EUR Best Practice with regard to SIGMET refers.

PART 2. RESPONSIBILITIES AND COORDINATION

2.1 General

2.1.1 SIGMET and AIRMET are of highest priority among other types of OPMET information provided to aviation users. The primary purpose of SIGMET and AIRMET is for in-flight service, which requires timely transmission of the SIGMET and, where available, AIRMET 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 and AIRMET information. Pilots contribute to the effectiveness of the SIGMET and AIRMET service through issuance of (routine and special) air-reports to the ATS units. Such air-reports are among the most valuable sources of information for the Meteorological Watch Offices (MWO) in the preparation of SIGMET and AIRMET. The ATS units receiving special air-reports should forward them to the associated MWOs without delay as well as to WAFCs if received by data-link communications. In addition, special air-reports of pre-eruption volcanic activity, a volcanic eruption, volcanic ash cloud or aircraft encounter with volcanic ash received by MWOs should be transmitted to their associated VAACs at the address specified in Table 4-2 of Doc 9766, to the WAFC London SADIS at the address specified in Appendix B of ICAO Doc 9766, according to the region containing the area affected, and the WAFC Washington at KWBCYMYX (reference ICAO Doc 9766).The ATS units receiving routine air-reports by data link communication should forward them to the associated MWOs and WAFCs without delay. Examples on the format and dissemination of special air-reports are provided at **Appendix I**.

2.1.3 As seen from the above, the SIGMET and AIRMET service involves Meteorology (MET), ATS and pilots. In order for the SIGMET and AIRMET 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 (VAACs) designated in the Regional ANP.

2.1.5 SIGMET and AIRMET information is also used for the flight planning and in-flight monitoring. This requires global dissemination of SIGMET and AIRMET through the EUR Regional OPMET Centres (ROCs) that will forward the information to the international OPMET data banks and World Area Forecast Centres (WAFCs) London and Washington for global distribution (WIFS and SADIS FTP noting WIFS does not distribute AIRMET and special air-reports) and 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 and AIRMET

2.2.1 SIGMET and AIRMET 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 and AIRMET provide information concerning the location, extent, intensity and expected evolution of the specified phenomena.

2.2.2 Information about the provision of SIGMET and AIRMET 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 EUR Region are listed in Table MET II-1 of the EUR eANP Volume II.

2.2.4 If, for some reason, a MWO is not able to meet its obligations, including the provision of SIGMET and AIRMET, 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 and AIRMET information, the MWOs have to strictly follow the format determined in Annex 3 (detailed format description is provided in Appendix 6, Table A6-1A of Annex 3). For more assistance, reference **Appendix H** to this guide - SIGMET Guidance Table: Enhanced SIGMET Guidance Table Developed from Annex 3 Table A6-1A. SIGMET and AIRMET 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 should not issue SIGMET and AIRMET for weather phenomena of lower intensity or of such transient nature or smaller scale, which do not affect significantly the flight safety, and their transmission to users may lead to unnecessary precautionary measures.

2.2.7 The MWOs should be adequately equipped in order to identify, analyse and forecast (to the extent required) those phenomena for which SIGMET and AIRMET 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 Area Control Centre (ACC) or Flight Information Centre (FIC), the MWO should:

a) issue the corresponding SIGMET and AIRMET 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). *Note that a list of special air-report headers for the EUR Region is provided at the following website:* http://www.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> MET Guidance ---> Headers – Special air-reports).

2.2.9 Appropriate telecommunication means have to be available at the MWO in order to ensure timely dissemination of SIGMET and AIRMET (as per Table MET II-1 of the EUR eANP Volume II) according to a dissemination scheme, which includes transmission to:

- local ATS users;
- aerodrome MET offices within the AOR;
- other MWOs concerned (it should be ensured that SIGMET and AIRMET 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 and AIRMET is required for transmission;
- the responsible Regional OPMET Centres (ROCs) and international EUR OPMET data banks (it should be arranged through the EUR RODEX scheme, that SIGMET and

AIRMET are sent to the designated OPMET data banks in other ICAO Regions, to the WAFCs and to the SADIS and WIFS Gateways noting WIFS does not distribute AIRMET and special air-reports); and

- responsible VAAC (if applicable).

*Note that SIGMET, AIRMET and special air-reports priority indicator is **FF** for flight safety messages (Annex 10, Volume II, 4.4.1.1.3 refers)*

2.2.10 In issuing SIGMET for volcanic ash, the MWOs should take into consideration the advisory information received from the responsible VAAC. In addition to the information received from the VAAC, 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 SIGMET and AIRMET issued by the associated MWO;

- receipt and display at the ATS unit of SIGMET and AIRMET issued by MWOs responsible for the neighbouring FIRs/ACCs if these SIGMET and AIRMET 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 and AIRMET 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 and AIRMET 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 and AIRMET 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 with responsibility for neighbouring FIRs

2.5.1 In order to provide consistent information to operators and air traffic control service providers, MWOs are encouraged to develop coordination processes with those MWOs responsible for adjacent FIRs.

2.5.2 Such coordination results in consistent forecasts of hazardous phenomenon and ensures that all stakeholders are basing their decisions on consistent, coherent, meteorological information.

2.5.3 From experience shared by those MWOs who already undertake such coordination, the following advice to the establishment of coordination activities is provided. It may of course be adapted to suit particular circumstances:

1) Managers of the meteorologists who will be engaged with coordination activities establish contact, and agree on the principles of coordination. Consider if Letters of Agreement or Memorandum of Understanding are necessary. A template Letter of Agreement is provided at **Appendix K.**

2) A template 'coordination process' is provided at **Appendix L**, and has been successfully used by a number of States with regard to establishing SIGMET coordination. It is intended that the template be adapted as necessary, but is also intended to help establish a degree of commonality.

3) Meteorologists who will be involved in the process should be involved early in the process of establishing the coordination activity.

4) Agree to the language under which coordination will take place.

5) Share the names of meteorologists who will be involved in the coordination process in advance. This seems to help overcoming any initial reluctance to contact the adjacent MWO. Where feasible within budgetary constraints, liaison through workshops of operational meteorologists should be encouraged.

6) Encourage meteorologists to be receptive to the ideas/opinions of adjacent MWO meteorologists. Whilst the MWO retains the ultimate right to issue the SIGMET as it considers most appropriate, a professional approach includes acknowledgement of the validity of additional opinions from fellow professionals.

7) Monitor the occasions where coordination has taken place to demonstrate the benefits of undertaking the process. Maintenance of logs, particularly where agreement cannot be reached, can provide great benefit in converging practices. **Appendix M** provides an example form for the monitoring of SIGMET coordination between MWOs.

8) Seek feedback from the meteorologists concerned.

9) Arrange an appropriate time for a review of the process between coordinating MWOs.

10) Introduce coordination activities in a gradual process – it may not be practical to implement coordination activities with all adjacent States at the same time, but once coordination activities begin the process is easier to implement with additional States.

2.5.4 The coordination process is also considered to facilitate closer relationships between National Meteorological Services (NMSs) and the meteorologists responsible for SIGMET and AIRMET production.

2.6 Coordination between MWOs and the VAACs

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

2.6.2 Since the identification, analysis and forecasting of volcanic ash require considerable technical and human resources, normally not available at each MWO, a number of Volcanic Ash Advisory Centres (VAACs) have been designated to provided VA advisories to the users and assist MWOs in the preparation of the SIGMET for volcanic ash. Close coordination should be established between the MWO and the responsible VAAC.

2.6.3 Information regarding the VAACs serving the EUR Region with their corresponding areas of responsibility and lists of MWOs to which advisories are to be sent is provided in Part 2 of the Handbook on the International Airways Volcano Watch (IAVW) (ICAO Doc 9766).

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, and numerical values of self-explanatory nature. All abbreviations and words to be used in SIGMET are given in **Appendix A.** In addition to the issuance of SIGMET information in Traditional Alphanumeric Code (TAC) format, MWOs should issue SIGMET information in the ICAO Meteorological Information Exchange Model (IWXXM) format. *Note that for more information; please refer to EUR Doc 018, EUR Doc 020 and WMO documentation.*

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. Annex 3, Appendix 6, Table A6-1A 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 Air Traffic Control (ATC) or by VOLMET or D-VOLMET or the aircraft operators. 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. In addition, incorrect SIGMET (e.g. error in FL) should be cancelled and a new SIGMET issued with the corrected information avoiding the use of COR as it is: a) not in Annex 3; b) is not supported by ICAO Meteorological Information Exchange Model (IWXXM); and c) is not clear to the users what element is corrected. 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.

3.1.6 Some SIGMET are generated using information from special air-reports (received by voice communications or data link (downlink)). The reporting of turbulence and icing used in special air-reports includes both moderate and severe categories (as per Doc 4444, Appendix 1). Some pilots report turbulence as "moderate to severe". A MWO is then faced with determining which category to use in a special air-report (uplink) or in a SIGMET message for severe turbulence. It is recommended to treat such "moderate to severe" observations as 'severe' in the context of using the report to prompt the issuance of a SIGMET message or a special air-report (uplink).

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, SS, and RDOACT CLD); this SIGMET is referred as WS SIGMET;
- SIGMET for volcanic ash is referred as WV SIGMET
- SIGMET for tropical cyclones is referred as WC SIGMET. Four EUR members (Portugal, Russian Federation, Spain, and United Kingdom) have responsibility for

issuing TC SIGMET for EUR/NAT FIRs. As such, guidance is included for TC SIGMET in this guide.

3.2.2 The type of SIGMET can be identified through the data type designator included in the World Meteorological Organization (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 in TAC (Traditional Alphanumeric Code) format 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;

These elements are also part of a SIGMET message in IWXXM format, according to the IWXXM Schema.

3.4 Format of SIGMET

Note 1: In the following text, square brackets - [ ] - are used to indicate a conditional element, and angled brackets - <> - for symbolic representation of a variable element, which in the real SIGMETs accepts explicit numerical values.

Note 2: The rules below apply for SIGMET in TAC format, as well as for SIGMETs in IWXXM format. However, for the exact formatting of the messages in IWXXM, the XML schema and schematron rules can be found at the following URL: http://schemas.wmo.int/iwxxm/.

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	**For SIGMET in TAC format:** **WS** – for SIGMET **WC** – for SIGMET for tropical cyclone (issued by four EUR Members with responsibility for EUR/NAT FIRs that are occasionally affected by Tropical Cyclones)) **WV** – for SIGMET for volcanic ash **For SIGMET in IWXXM format:** **LS** – for SIGMET **LY** – for SIGMET for tropical cyclone **LV** – 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 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 Aeronautical Fixed Telecommunication Network (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, Control Area (CTA) or Upper Information Region (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), as for example in Germany:

"WSDL31 EDZF" and "WVDL31 EDZF" for EDGG LANGEN FIR
"WSDL31 EDZH" and "WVDL31 EDZH" for EDWW BREMEN FIR
"WSDL31 EDZM" and "WVDL31 EDZM" for EDMM MUENCHEN FIR
"WSDL32 EDZF" and "WVDL32 EDZF" for EDUU RHEIN UIR
"WSDL32 EDZH" and "WVDL32 EDZH" for EDVV HANNOVER UIR

Examples:

WSDL32 EDZF 121200
WVJP01 RJTD 010230
WCNG21 AYPY 100600

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

3.4.2 First line of TAC SIGMET

CCCC SIGMET [n][n]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, UIR or CTA to which the SIGMET refers
SIGMET	Message identifier
[n][n]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:

EDWW SIGMET 3 VALID 121100/121500 EDZH-
VHHK SIGMET A04 VALID 202230/210230 VHHH-

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 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 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); and
    - for WV and WC 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:

   WSIE31 EIDB 241120
   EIDB SIGMET 3 VALID 241120/241500 EINN-

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

   WSSG31 WSSC 251130
   WSSA SIGMET 1 VALID 251530/251930 WSSM-

3.4.3 *Format of the meteorological part of SIGMET messages in Traditional Alphanumeric Code format*

3.4.3.1 The meteorological part of a SIGMET consists of nine 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 FIR/UIR or UIR or CTA	Description of the phenomenon	Observed or forecast	Location of the phenomenon*	Flight level or altitude and extent*
<CCCC>	<name> FIR [FIR/UIR, UIR, CTA]	<Phenomenon>	OBS [AT <GGggZ>] or FCST [AT <GGggZ>]	Geographical location of the phenomenon given by coordinates, or by reference to lines	FL<nnn/nnn> or [SFC/]FL<nnn> or

				of latitude and or longitude	[SFC/]<nnnn>M or [SFC/]<[n]nnnn>FT or TOP FL<nnn> or [TOP] ABV FL<nnn> or [TOP] ABV <[n]nnnn>FT

7	8	9	
Movement or expected movement*	Changes in intensity*	Forecast position at the end of the validity period*	
MOV <direction, speed> KMH[KT], or STNR	INTSF or WKN or NC	FCST AT <GGggZ>	location of the phenomenon given by coordinates or by reference to lines of latitude and or longitude

*In the case of the same phenomenon covering more than one area within the FIR, these elements can be repeated, as necessary for volcanic ash and tropical cyclone only. .

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

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

Example:

EDBB BERLIN FIR

3.4.3.1.2 Phenomenon

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. The appropriate abbreviations and combinations thereof, and their meaning are given in **Appendix C**. SIGMET shall be issued only for the following phenomena (with only one phenomenon in each SIGMET):

- 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
- volcanic ash – VA (+volcano name, if known)
- tropical cyclone – TC (+cyclone name)

For volcanic ash SIGMET (WV) only, the following conventions should be used

In the case when the eruption is from a previously unknown or un-named volcano.

VA ERUPTION PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn] VA CLD

In the case when the eruption is from a known and named volcano. The name may be up to 10 alphanumeric characters.

VA ERUPTION MT nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn] VA CLD

In the case when a region of volcanic ash cloud is known to exist, but the precise origin of its source is unknown (the ash cloud may be of large horizontal extent, and obscuring the precise vent from which it emanates, and is otherwise in an area sparse of observation to identify the source).

It is worth noting that formats of volcanic ash SIGMET (WV) issued by the MWOs and Volcanic Ash Advisories (VAA) issued by the VAACs are clearly distinct. Several examples of WV are provided in Appendix G. Template for VAA is described in Appendix 2 of Annex 3 (Table A2-1).

For tropical cyclone SIGMET (WC) only, the following conventions should be used

In the case when the tropical cyclone is known and named. The name may be up to 10 alphanumeric characters.

TC nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB

In the case when the tropical cyclone is not yet named.

TC NN PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB

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 may be 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 is not known the time is not included. When the phenomenon is based on a forecast without a reported observation, the time given for GGggZ represents the time of commencement of the phenomenon.

Examples:

OBS
OBS AT 0140Z
FCST
FCST AT 0200Z

Appendix G, section 11 provides additional examples and advice with regard to using **FCST AT <GGggZ>.**

3.4.3.1.4 Location of the phenomenon

The location of the phenomenon is given with reference to geographical coordinates (latitude and longitude in degrees, or in degrees and minutes). 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 number of points given with their coordinates should be no less than 4 and normally no greater than 7 noting the end point should be a repeat of the start point. The recommended best practice is to list the coordinates in a clockwise order as this is an XML/GML convention.

The following is the most preferred way to describe the location of the phenomenon for ingestion into automated systems used by the airlines for flight planning and in-flight decision making:

1) An area of the FIR or UIR defined by a polygon. The end point should be a repeat of the start point.

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]>] [-
<Nnn[nn]>or<Snn[nn]><Wnnn[nn]>or<Ennn[nn]>] [-
<Nnn[nn]>or<Snn[nn]><Wnnn[nn]>or<Ennn[nn]>]

For example:

WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550

WI N60 E025 – N62 E027 – N58 E030 – N59 E026 – N60 E025

Use of polygons with complex FIR boundaries

Annex 3 (19th Edition, July 2016) specifies that the points of a polygon '… should be kept to a minimum and should not normally exceed seven'. However, some FIR boundaries are complex, and it would be unrealistic to expect that a polygon would be defined that followed such boundaries exactly. As such, some States have determined that the polygon points be chosen in relation to the complex boundary such that the FIR boundary approximates, but is wholly encompassed by, the polygon, and that any additional area beyond the FIR boundary be the minimum that can be reasonably and practically described. Caution should however be exercised in those instances where international aerodromes are located in close proximity to such a complex FIR boundary. **Appendix G** provides examples and advice with regard to describing such areas.

The following are additional ways to describe the location of the phenomenon (however they can only be used for SIGMETs in TAC format):

2a) In a sector of the FIR (or UIR) defined relative to specified line or single series of up to three connected lines, with start and end points on the FIR (or UIR) boundary.

With reference to a LINE, described with latitude/longitude of two to four points. These points should be on the FIR boundary, or so close to the FIR boundary to leave no doubt as to the intent that the points should be considered as being on the FIR boundary.

<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> LINE <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]>]

For example:

NE OF LINE N2500 W08700 – N2000 W08300

SE OF LINE N3730 W01230 – N4000 W1130 – N3830 W01030 - N3800 W00945

W OF LINE N20 E042 – N35 E045

2b) In a sector of the FIR (or UIR) defined as being between two lines of latitude, or between two lines of longitude.

Symbolically this is indicated as:

<N OF> or <S OF> <Nnn[nn]> or <Snn[nn]> AND <N OF> or <S OF> <Nnn[nn]> or <Snn[nn]>

<W OF> or <E OF> <Wnnn[nn]> or <Ennn[nn]> AND <W OF> or <E OF> <Wnnn[nn]> or <Ennn[nn]>

Chosen so that the affected area is BETWEEN lines of latitude or BETWEEN lines of longitude, or area that meets both criteria.

For example:

N OF N1200 AND S OF N2530

W OF W060 AND E OF W082

2c) In a sector of the FIR (or UIR) defined as being between two specified lines, or between two series of up to three connected lines, each with start and endpoints on the FIR (or UIR) boundary.

<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> LINE <Nnn[nn]> or <Snn[nn]><Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]><Wnnn[nn]> or <Ennn[nn]>[- <Nnn[nn]> or <Snn[nn]><Wnnn[nn]> or <Ennn[nn]>][- <Nnn[nn]> or <Snn[nn]><Wnnn[nn]> or <Ennn[nn]>] AND <N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> LINE <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]>]

Chosen so that the affected area is BETWEEN two specified lines, or meets both criteria.

For example:

NE OF LINE N2500 W08700 – N2000 W08300 AND SW OF LINE N2800 W08500 – N2200 W08200

W OF LINE N20 E042 – N35 E045 AND E OF LINE N20 E039 – N35 E043

2d) In a sector of the FIR (or UIR) defined relative to a line of latitude and a line of longitude (effectively a quadrant)

<N OF> or <S OF> <Nnn[nn]> or <Snn[nn]> AND <E OF> or <W OF> <Ennn[nn]> or <Wnnn[nn]>

For example:

N OF N1200 AND E OF W02530

S OF N60 AND W OF E030

2e) In a sector of the FIR (or UIR) defined relative to a line of latitude or longitude (effectively a segment)

- Indication of a part of the FIR with reference to latitude:

  <N OF> or <S OF> <Nnn[nn]> or <Snn[nn]>

  For example:

  N OF S2230

- Indication of a part of the FIR with reference to a longitude:

  <E OF> or <W OF> <Ennn[nn]> or <Wnnn[nn]>

  For example:

  W OF E080

3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by;

APRX nnKM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> [- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]

or

```
APRX nnNM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[
- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][ -
<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]
```

4) At a specific point within the FIR (or UIR)

At a specific point within the FIR, indicated by a single coordinate of latitude and longitude

<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>

For example:

N5530 W02230

S23 E107

5) Within a specified radius of the centre of a tropical cyclone.

Symbolically, this is indicated as:

```
WI <nnnKM> OF TC CENTRE
WI <nnnNM> OF TC CENTRE
```

6) A reference to the whole FIR, FIR/UIR, UIR or CTA.

Symbolically, this is indicated as:

```
ENTIRE FIR[UIR, FIR/UIR]

ENTIRE CTA
```

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

3.4.3.1.5 Flight level or altitude and extent

FLnnn

or

nnnnM

or

[n]nnnnFT

or

SFC/FLnnn

or

SFC/nnnnM

or

SFC/[n]nnnnFT

or

FLnnn/nnn

or

TOP FLnnn

or

ABV FLnnn

or

TOP ABV FLnnn

or

ABV [n]nnnnFT

or

TOP ABV [n]nnnnFT

or

TOP BLW FLnnn (only to be used for tropical cyclone)

or

nnnn/nnnnM

or

[n]nnnn/[n]nnnnFT

or

nnnnM/FLnnn

or

[n]nnnnFT/FLnnn

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>**;

  For example: **FL320**

- reporting at a single geometric level, in metres or feet – **<nnnn>M or <nnnn>FT**

  For example: **4500M or 8250FT or 12000FT**

- 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;

  For example: **SFC/FL320** or **SFC/3000M** or **SFC/9900FT**

- 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;

  For example: **FL250/290**

- reporting the top of a phenomenon with reference to one flight level (base is unknown, but top is known) – **TOP FL<nnn>**

For example: **TOP FL350**

- reporting a phenomenon with reference to one flight level and the abbreviation ABV (top is unknown, but base is known) – **ABV FL<nnn>**

  For example: **ABV FL350**

- reporting the top of a phenomenon with reference to one flight level and the abbreviation ABV – **TOP ABV FL<nnn>**

  For example: **TOP ABV FL350**

- reporting phenomenon expected between a lower and upper geometric level expressed in metres or feet:

  For example: **3500/9000M or 8000/12000FT or 11000/14000FT**

- reporting phenomenon expected between a lower geometric level expressed in metres or feet and a higher flight level:

  For example: **4000M/FL220 or 6000FT/FL140 or 11000FT/FL190**

- reporting the CB upper limit for tropical cyclone SIGMET

  For example: **TOP BLW FL450**

Additional examples:

EMBD TS … TOP ABV FL340
SEV TURB … FL180/210
SEV ICE … SFC/FL150
SEV MTW … FL090/180

3.4.3.1.6 Movement

Note: This option must not be used in combination with the 'Forecast position ' section of SIGMET. Only one or the other of the two options may be used, not both.

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

Direction of movement is given with reference to one of the sixteen points of compass (**N**, **NNE**, **NE**, **ENE**, **E**, **ESE**, **SE**, **SSE**, **S**, **SSW**, **SW**, **WSW**, **W**, **WNW**, **NW**, **NNW**). 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
STNR

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

3.4.3.1.8 Forecast time

This section is used with 'Forecast position' to explicitly provide a forecast of the position of the phenomena at the time specified. The format is fixed, and is of the form

FCST AT GGggZ

for example

FCST AT 1600Z

where the forecast time is the same as the SIGMET validity end time.

Note. — In accordance with Annex 5 – Units of Measurement to be Used in Air and Ground Operations, *when the validity period ends at midnight, YY should be set for the following day and GGgg should be '0000'. i.e. SIGMET validity ending at midnight on the 23rd day of the month should be expressed as '240000'.*

3.4.3.1.9 Forecast position at the end of the SIGMET validity period

Forecast position of the phenomenon at the end of the validity period of the SIGMET message is conditional, included wherever applicable, instead of the movement/expected movement option. The location of the phenomenon is indicated by one of the ways described in 3.4.3.1.4 above. The levels of the phenomenon are considered to remain fixed throughout the SIGMET validity period because there is currently no provision for indicating changes to the levels. As such, and as per footnote 25 to Table A6-1A of Annex 3 (19thEdition, July 2016), it should be assumed that the levels affected remain the same for both initial and forecast positions.

Example:

FCST AT 1630Z WI N4519 E02849 – N4400 E02750 – N4338 E02533 – N4351 E02250 – N4519 E02849

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

3.4.3.1.10 Possible use of FCST AT for the element 7 of ICAO Annex 3 (Table A6-1A)

Observed or forecast phenomenon (M):	Indication whether the information is observed and expected to continue, *or* forecast	OBS [AT GGggZ] *or* FCST [AT GGggZ]	OBS OBS AT 1210Z FCST FCST AT 1815Z

In Annex 3 Table A6-1A Template for SIGMET and AIRMET messages, the 7th element (between 'Phenomenon' and the 'Location') is as reproduced here below:

The mention of ***AT GGggZ***, to emphasize the time when the phenomenon was observed '***OBS AT GGggZ***' or the time when the phenomenon is forecast to start '***FCST AT GGggZ***', is optional. However, in the case of ***OBS AT***, the relevance to indicate the time of the report/observation having triggered or confirmed the phenomenon is quite obvious. This is generally the case when ***OBS AT*** is used to have different times for the observation and the start of validity of the SIGMET. The observation can be the trigger that will make the forecaster issuing a SIGMET and the time of writing and issuing the SIGMET will lead to a SIGMET start validity time later than the observation. Hence, the need to use ***OBS AT*** should seem natural to most of SIGMET producers. This is not true with the use of ***FCST AT*** where two possibilities may be considered:

- using FCST AT with a different time from the one of validity period;
- using FCST AT with the same time as the validity period starting hour.

These two possibilities are exemplified in section G 9).

3.4.5 ***Cancellation of SIGMET***

3.4.5.1 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. This is in support to Annex 3, 7.1.2 which requires "*SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area*".

The cancellation is done by issuing the same type of SIGMET with the following structure in TAC format:

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

Examples:

1. Cancellation of a WS 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 WV 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 131515/132115 VA MOV TO YUDO FIR=

Note. *– For SIGMET for volcanic ash only, the FIR (YUDO in the example) where the volcanic ash has moved into is permitted to be indicated.*

3.4.5.2 If it is known that an existing SIGMET no longer accurately describes the existing or expected future evolution of the phenomena a new SIGMET, correctly describing the hazard should be issued, followed immediately by a cancellation of the original, erroneous SIGMET. The new SIGMET should be issued before the cancellation in order to ensure there is always a SIGMET in force and that the cancellation is not mistakenly understood to mean the hazard has completely dissipated.

In order to prevent unwanted suppression or overwriting of SIGMET messages, the WMO Abbreviated Header Line (AHL) must always be unique. This may mean issuing SIGMET bulletins with at least 1 minute difference in the compilation time.

Originally issued SIGMET, later determined to no longer be accurate (bold text identifies points that will be changed):

WSAU21 ADRM 201855
YBBB SIGMET E01 VALID 202000/202400 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 – **S1900 E13730 – S2000 E13130** – S1600 E13500 – S1530 E13700 SFC/FL120 MOV SE 12KT WKN=

Updated SIGMET (bold text identifies points that have been changed):

WSAU21 ADRM 202155
YBBB SIGMET E02 VALID 202155/202400 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 – **S2000 E13750 – S2045 E13245** – S1600 E13500 – S1530 E13700 SFC/FL120 MOV SE 12KT WKN=

Cancellation SIGMET (this cancels the original SIGMET):

WSAU21 ADRM 202156
YBBB SIGMET E03 VALID 202156/202400 YPDM-
YBBB BRISBANE FIR CNL SIGMET E01 202000/202400=

3.4.5.3 If a SIGMET was issued with an error (e.g. incorrect FL), a new SIGMET with the correct information should be issued, followed immediately by a cancellation of the original, incorrect SIGMET. Avoid the use of COR as it is: 1) not in Annex 3; 2) is not supported by IWXXM; and 3) is not clear to the users what element is corrected. The new SIGMET should be issued before the cancellation in order to ensure there is always a SIGMET in force and that the cancellation is not mistakenly understood to mean the hazard is no longer present.

Furthermore, if a SIGMET is cancelled before its start of validity, the cancellation SIGMET should refer to the whole period of the SIGMET originally issued.

Originally issued SIGMET, subsequently determined to contain an error (bold text identifies the element that is considered to be incorrect):

WSAU21 ADRM 201855
YBBB SIGMET E04 VALID 202000/202300 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 – S2000 E13750 – S2045 E13245 – S1600 E13500 – S1530 E13700 SFC/**FL020** MOV SE 12KT WKN=

Updated SIGMET (bold text identifies what has been changed):

WSAU21 ADRM 201900
YBBB SIGMET E05 VALID 202000/202300 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 – S2000 E13750 – S2045 E13245 – S1600 E13500 – S1530 E13700 SFC/**FL120** MOV SE 12KT WKN=

Cancellation SIGMET (this cancels the original incorrect SIGMET)

WSAU21 ADRM 201905
YBBB SIGMET E06 VALID 202000/202300 YPDM-
YBBB BRISBANE FIR CNL SIGMET E04 202000/202300=

PART 4. RULES FOR PREPARATION OF AIRMET INFORMATION

Note: This guidance is developed as a follow-up of EANPG Conclusion 49/42.

4.1 General

4.1.1 AIRMET should be issued by MWOs in accordance with the regional air navigation agreement. According to the EUR Air Navigation Plan, Volume II, Part V – Meteorology (MET), AIRMET information should be issued by a MWO if agreed on between the users and the meteorological authority concerned. The requirement for the issuance of AIRMET should be reflected in Table MET II-1. The decision of a meteorological authority for issuance of AIRMET should also be based on an assessment of the density of air traffic operating below flight level 100 (or flight level 150 or higher in mountainous areas).

4.1.2 AIRMET is issued for a FIR; where necessary, the FIR should be divided in sub-areas and separate AIRMET issued for each sub-area.

4.1.3 When issuing AIRMET information, MWOs should pay attention on the related products, such as GAMET and SIGMET, in order to avoid duplication. An inventory on regional exchange of GAMET and graphical products to support low-level flights is provided at the following link: http://www2010.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> MET Guidance ---> Headers and exchange – GAMET for LLF Flight).

4.1.4 AIRMET information is prepared in abbreviated plain language using approved ICAO abbreviations, a limited number of non-abbreviated words, and numerical values of self-explanatory nature. All abbreviations and words to be used in AIRMET are given in **Appendix A.** In addition to the issuance of AIRMET information in Traditional Alphanumeric Code (TAC) format, MWOs should issue AIRMET information in the ICAO Meteorological Information Exchange Model (IWXXM) format. *Note that for more information; please refer to EUR Doc 018, EUR Doc 020 and WMO documentation.*

4.1.5 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 AIRMET, are prepared and transmitted in the prescribed standardized formats. Therefore, the structure and format of the AIRMET message, as specified in Annex 3, Part II, Appendix 6, should be followed strictly by the MWOs. Annex 3, Appendix 6, Table A6-1A provides detailed information regarding the content and order of elements in the AIRMET message.

4.1.6 AIRMET messages should be kept short and clear, without additional descriptive text other than that prescribed in Annex 3.

4.1.7 After issuing an AIRMET, the MWO should maintain watch over the evolution of the phenomenon for which the AIRMET has been issued and issue a new updated AIRMET when necessary.

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

4.2 Structure of the AIRMET message

4.2.1 An AIRMET message in TAC format consists of:

- *WMO heading* – all AIRMETs 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 AIRMET is issued.

These elements are also part of an AIRMET message in IWXXM format, according to the IWXXM schema.

4.3 Format of AIRMET

Note 1: 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 AIRMETs accepts concrete numerical values.

Note 2: The rules below apply for AIRMET in TAC format, as well as for AIRMETs in IWXXM format. However, for the exact formatting of the messages in IWXXM, the XML schema and schematron rules can be found at the following URL: http://schemas.wmo.int/iwxxm/.

*4.3.1 **WMO Header***

$T_1T_2A_1A_2$ii CCCC YYGGgg

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

T_1T_2	Data type designator	**WA** (AIRMET in TAC format) **LW** (AIRMET in IWXXM format)
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)

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

4.3.1.3 **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 AIRMET (normally this is the time assigned by the AFTN centre which disseminates the message).

4.3.1.4 A unique WMO header should be assigned for each AIRMET bulletin issued for an FIR, or part of an FIR. The distinction between different AIRMET bulletins issued by the State's MWOs should be through the bulletin number (ii) as, for example:

WABX31 EBBR 061752 *[Example from Belgium]*

WAPL31 EPWA 061534 *[Example from Poland]*

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

*4.3.2 **First line of AIRMET***

CCCC AIRMET [n][n]n VALID YYGGgg/YYGGgg CCCC-

4.3.2.1 The meaning of the groups in the first line of the AIRMET is as follows:

CCCC	ICAO location indicator of the ATS unit serving the FIR to which the AIRMET refers
AIRMET	Message identifier
[nn]n	Daily sequence number (see paragraph 3.4.2.2)
VALID	Period of validity indicator
YYGGgg/YYGGgg	Validity period of the AIRMET 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)

4.3.2.2 The numbering of the AIRMETs 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:

EDWW AIRMET 3 VALID 121100/121500 EDZH-

EPWW AIRMET 5 VALID 061535/061935 EPWA-

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

- the period of validity of AIRMET shall not exceed 4 hours;
- in case of a AIRMET 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 AIRMET validity period;
- when the AIRMET is issued for an expected 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 AIRMET) should be not more than 4 hours before the start of validity period (i.e., expected time of occurrence of the phenomenon); and

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

Examples:

1. AIRMET for an observed phenomenon:

WADL41 EDZF 070015
EDGG AIRMET 01 VALID 070015/070300 EDZF-
EDGG LANGEN FIR ISOL TS OBS N OF N49 TOP FL330 MOV E WKN=

2. AIRMET for a forecast phenomenon:

WASW41 LSSW 061758
LSAS AIRMET 5 VALID 061800/062100 LSZH-
LSAS SWITZERLAND FIR MOD TURB FCST ALPS SFC/FL160 STNR NC=

4.3.3 ***Format of the meteorological part of AIRMET messages***

4.3.3.1 The meteorological part of an AIRMET 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 or CTA	Location indicator and name of the FIR/CTA, or part thereof for which the AIRMET is issued^	Description of the phenomenon	Observed or forecast	Location (referring to latitude and longitude (in degrees and minutes))	Level
<CCCC>	<name> FIR[/n]	<Phenomenon>	OBS [AT <GGggZ>] or FCST [AT <GGggZ>]	Geographical location of the phenomenon given by coordinates	FL<nnn/nnn> or [SFC/]FL<nnn> or [SFC/]<[n]nnnn> M or [SFC/]<nnnn>FT or TOP FL<nnn> or [TOP] ABV FL<nnn> or [TOP] ABV <[n]nnnn>FT or [<nnnn>/]<nnnn> M or [<[n]nnnn>/]<[n] nnnn>FT or [<nnnn>M/]FL<n nn> or [<[n]nnnn>FT/]F L<nnn>

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

^when FIR is divided in sub-areas: separate AIRMET should be issued for each sub-area, as necessary. Issued AIRMET and GAMET should cover the same sub-area.

4.3.3.1.1 Location indicator and name of the FIR

location indicator <name> FIR[/n]

Example:

EBBU BRUSSELS FIR

4.3.3.1.2 Phenomenon

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. The appropriate abbreviations and combinations thereof, and their meaning are given in **Appendix D**. AIRMET shall be issued only for the following phenomena (with only one phenomenon in each AIRMET): at cruising levels below FL100 (FL150 or higher for mountainous areas ("An area of changing terrain profile where the changes of terrain elevation exceed 900m (3000 ft) within a distance of 18.5 km (10.0 NM)" – Chap 1, Vol II, ICAO Doc 8168 - *Aircraft Operations*), where necessary):

- surface wind
- surface visibility
- thunderstorms
- mountain obscuration
- cloud
- icing
- turbulence
- mountain wave

4.3.3.1.3 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 may be 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 is not known, the time is not included. When the phenomenon is based on a forecast without a reported observation, the time given for GGggZ represents the time of commencement of the phenomenon.

Examples:

OBS
OBS AT 0140Z
FCST
FCST AT 0200Z

4.3.3.1.4 Location of the phenomenon

The location of the phenomenon is given with reference to geographical coordinates (latitude and longitude in degrees and minutes). 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 number of coordinates should be no less than 4 and normally no greater than 7 noting the first point is repeated (the end point should be a repeat of the start point). The recommended best practice is to list the coordinates in a clockwise order as this is an XML/GML convention.

The following is the most preferred way to describe the location of the phenomenon for ingestion into automated systems used by the airlines for flight planning and in-flight decision making:

1) An area of the FIR defined by a polygon. The end point should be a repeat of the start point.

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]>] [-
<Nnn[nn]>or<Snn[nn]><Wnnn[nn]>or<Ennn[nn]>] [-
<Nnn[nn]>or<Snn[nn]><Wnnn[nn]>or<Ennn[nn]>]

For example:

WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550

WI N60 E025 – N62 E027 – N58 E030 – N59 E026 – N60 E025

Use of polygons with complex FIR boundaries

Annex 3 (19th Edition, July 2016) specifies that the points of a polygon '… should be kept to a minimum and should not normally exceed seven'. However, some FIR boundaries are complex, and it would be unrealistic to expect that a polygon would be defined that followed such boundaries exactly. As such, some States have determined that the polygon points be chosen in relation to the complex boundary such that the FIR boundary approximates, but is wholly encompassed by, the polygon, and that any additional area beyond the FIR boundary be the minimum that can be reasonably and practically described. Caution should however be exercised in those instances where international aerodromes are located in close proximity to such a complex FIR boundary. **Appendix G** provides examples and advice with regard to describing such areas.

The following are additional ways to describe the location of the phenomenon (however, they can only be used for AIRMETs in Traditional Alphanumeric Code format):

2a) In a sector of the FIR defined relative to specified line or single series of up to three connected lines, with start and end points on the FIR boundary.

With reference to a LINE, described with latitude/longitude of two to four points. These points should be on the FIR boundary, or so close to the FIR boundary to leave no doubt as to the intent that the points should be considered as being on the FIR boundary.

<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> [LINE]<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]>]

For example:

NE OF LINE N2500 W08700 – N2000 W08300

SE OF LINE N3730 W01230 – N4000 W1130 – N3830 W01030 N3800 W00945

W OF LINE N20 E042 – N35 E045

2b) In a sector of the FIR defined as being between two lines of latitude, or between two lines of longitude.

Symbolically this is indicated as:

<N OF> or <S OF><Nnn[nn]>or <Snn[nn]> AND <N OF> or <S OF><Nnn[nn]>or <Snn[nn]>

<W OF> or <E OF><Wnnn[nn]>or <Ennn[nn]> AND <W OF> or <E OF><Wnnn[nn]>or <Ennn[nn]>

Chosen so that the affected area is BETWEEN lines of latitude or BETWEEN lines of longitude, or that meets both criteria.

For example:

N OF N1200 AND S OF N2530

W OF W060 AND E OF W082

2c) In a sector of the FIR defined as being between two specified lines, or between two series of up to three connected lines, each with start and endpoints on the FIR boundary.

<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> LINE <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>] AND <N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W OF> or <NW OF> LINE <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]>]

Chosen so that the affected area is BETWEEN two specified lines, or meets both criteria.

For example:

NE OF LINE N2500 W08700 – N2000 W08300 AND SW OF LINE N2800 W08500 – N2200 W08200

W OF LINE N20 E042 – N35 E045 AND E OF LINE N20 E039 – N35 E043

2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant)

<N OF> or <S OF> <Nnn[nn]> or <Snn[nn]> AND <E OF> or <W OF> <Ennn[nn]> or <Wnnn[nn]>

For example:

N OF N1200 AND E OF W02530

S OF N60 AND W OF E030

2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment)

- Indication of a part of the FIR with reference to latitude:

  <N OF> or <S OF> <Nnn[nn]> or <Snn[nn]>

  For example:

  N OF S2230

- Indication of a part of the FIR with reference to a longitude:

  <E OF> or <W OF> <Ennn[nn]> or <Wnnn[nn]>

  For example:

  W OF E080

3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by;

```
APRX nnKM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[
- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][ -
<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]
```

or

```
APRX nnNM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[
- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][ -
<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]
```

4) At a specific point within the FIR

At a specific point within the FIR, indicated by a single coordinate of latitude and longitude

<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -

For example:

N5530 W02230

S23 E107

5) A reference to the whole FIR.

Symbolically, this is indicated as:

```
ENTIRE FIR [/[n]]
```

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

4.3.3.1.5 Flight level or altitude and extent

FLnnn
or
nnnnM
or
[n]nnnnFT
or
SFC/FLnnn
or
SFC/nnnnM
or
SFC/[n]nnnnFT
or
FLnnn/nnn
or
TOP FLnnn
or
ABV FLnnn
or
TOP ABV FLnnn
or
ABV [n]nnnnFT
or
TOP ABV [n]nnnnFT
or
nnnn/nnnnM
or
[n]nnnn/[n]nnnnFT
or
nnnnM/FLnnn
or
[n]nnnnFT/FLnnn

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>**;

  For example: **FL090**

- reporting at a single geometric level, in metres or feet– **<nnnn>M or <[n]nnnn>FT**

  For example: **4500M or 8200FT or 12000FT**

- reporting of a layer – **SFC/FL<nnn>, SFC/<nnnn>M, or SFC/<[n]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;

  For example: **SFC/FL100** or **SFC/3000M** or **SFC/11000FT**

- 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;

  For example: **FL070/090**

- reporting the top of a phenomenon with reference to one flight level (base is unknown but top is known) – **TOP FL<nnn>**

  For example: **TOP FL080**

- reporting a phenomenon with reference to one flight level and the abbreviation ABV (top is unknown, but base is known) –**ABV FL<nnn>**

  For example: **ABV FL060**

- reporting the top of a phenomenon exceeding the vertical limit of AIRMET message and the abbreviation ABV – **TOP ABV FL<nnn>**

  For example: **TOP ABV FL060**

- reporting phenomenon expected between a lower and upper geometric level expressed in metres or feet - <nnnn>/<nnnn>M - <[n]nnnn>/<[n]nnnn>FT;

  For example: **3500/9000M or 8000/12000FT or 11000/14000FT**

- reporting phenomenon expected between a lower geometric level expressed in metres or feet and a higher flight level - <nnnn>M/FL<nnn> - <[n]nnnn>FT/FL<nnn>;

  For example: **4000M/FL220 or 6000FT/FL140 or 11000FT/FL190**

Additional Examples:

ISOL CB … TOP ABV FL100
MOD TURB … FL050/080
MOD ICE … SFC/FL090
MOD MTW … FL060/180

Note that the flight levels reported should be up to FL100 (FL150 or higher for mountainous areas, where necessary).

4.3.3.1.6 Movement

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

Direction of movement is given with reference to one of the sixteen points of compass (**N**, **NNE**, **NE**, **ENE**, **E**, **ESE**, **SE**, **SSE**, **S**, **SSW**, **SW**, **WSW**, **W**, **WNW**, **NW** and **NNW)**. Speed is given in **KMH** or **KT**. The abbreviation **STNR** is used if no significant movement is expected.

Examples:

MOV NW
MOV NNW 30KMH
MOV E 25KT
STNR

Note. – Annex 3 (19th Edition, July 2016) does not enable AIRMET to contain explicit forecast position as per SIGMET message.

4.3.3.1.7 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

4.3.4 ***Cancellation of AIRMET***

4.3.4.1 If, during the validity period of an AIRMET, the phenomenon for which the AIRMET had been issued is no longer occurring or no longer expected, this AIRMET should be cancelled by the issuing MWO. This is in support to Annex 3, 7.2.2 which requires "*AIRMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area*".

Note – If it is expected (or confirmed from observation) that the phenomenon for which AIRMET had been issued will change (or has changed) significantly from the original message content, the current AIRMET message should be cancelled and a new AIRMET message should be issued as appropriate (see 4.3.4.2).

The cancellation is done by issuing the same type of AIRMET with the following structure in TAC format:

- WMO heading with the same data type designator;

- first line, including the next sequence number followed by a new validity period that represents the remaining time of the original period of validity, and

- second line, which contains the location indicator and name of the FIR, the combination CNL AIRMET, followed by the sequential number of the original AIRMET and its original validity period.

Examples:

Cancellation of AIRMET with the following first line:

WAXY31 YUSO 151520
YUDD AIRMET 1 VALID 151520/151800 YUSO-
YUDD SHANLON FIR …

Cancellation AIRMET:

WAXY31 YUSO 151650
YUDD AIRMET 2 VALID 151650/151800 YUSO-
YUDD SHANLON FIR CNL AIRMET 1 151520/151800=

4.3.4.2 If it is known that an existing AIRMET no longer accurately describes the existing or expected future evolution of the phenomena a new AIRMET, correctly describing the hazard should be issued, followed immediately by a cancellation of the original, erroneous AIRMET. The new AIRMET should be issued before the cancellation in order to ensure there is always an AIRMET in force and that the cancellation is not mistakenly understood to mean the hazard has completely dissipated.

In order to prevent unwanted suppression or overwriting of AIRMET messages, the WMO AHL must always be unique. This may mean issuing AIRMET bulletins with at least 1 minute difference in the compilation time.

Originally issued AIRMET, later determined to no longer be accurate (bold text identifies points that will be changed):

WSAU21 ADRM 201855
YBBB AIRMET E01 VALID 202000/202400 YPDM-
YBBB BRISBANE FIR MOD TURB FCST WI **S1900 E13730 – S2000 E13130** -
S1600 E13500 – S1530 E13700 SFC/FL120 MOV SE 12KT WKN=

Update AIRMET (bold text identifies points that have been changed):

WSAU21 ADRM 202155
YBBB AIRMET E02 VALID 202155/202400 YPDM-
YBBB BRISBANE FIR MOD TURB FCST WI S1530 E13700 – **S2000 E13750 – S2045 E13245** – S1600 E13500 – S1530 E13700 SFC/FL120 MOV SE 12KT WKN=

Cancellation AIRMET (this cancels the original AIRMET):

WSAU21 ADRM 202156
YBBB AIRMET E03 VALID 202155/202400 YPDM-
YBBB BRISBANE FIR CNL AIRMET E01 202000/202400=

APPENDIX A

List of the abbreviations and decode used in SIGMET and AIRMET in Traditional Alphanumeric Code

Abbreviation	Decode
ABV	Above
AIRMET	AIRMET Information
AND*	And
APRX	Approximate or approximately
AT	At *(followed by time)*
BKN	Broken
BLW	Below
BR	Mist
BTN	Between
BY*	By
CB	Cumulonimbus
CENTRE*	Centre *(used to indicate tropical cyclone centre)*
CLD	Cloud
CNL	Cancel *or* cancelled
CTA	Control area
DS	Duststorm
DU	Dust
DZ	Drizzle
E	East *or* eastern longitude
EMBD	Embedded in layer *(to indicate CB embedded in layers of other clouds)*
ENE	East-Northeast
ENTIRE*	Entire
ERUPTION*	Eruption *(used to indicate volcanic eruption)*
ESE	East-Southeast
EXP	Expected
FCST	Forecast
FG	Fog
FIR	Flight information region (link to global FIR map: http://gis.icao.int/flexviewer/)
FL	Flight level
FRQ	Frequent
FU	Smoke
FZRA	Freezing rain
GR	Hail
GS	Small hail and/or snow pellets
HVY	Heavy *(used to indicate intensity of weather phenomena)*
HZ	Haze
ICE	Icing
INTSF	Intensify *or* intensifying
ISOL	Isolated
KM	Kilometres
KMH	Kilometres per hour
KT	Knots
LINE	Line
MPS	Metres per second
MOD	Moderate *(used to indicate intensity of weather phenomena)*
MOV	Move *or* moving *or* movement
MT	Mountain
MTW	Mountain waves

Abbreviation	Decode
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)*
OVC	Overcast
PL	Ice pellets
PO	Dust/sand whirls
PSN	Position
RA	Rain
RDOACT*	Radioactive
S	South *or* southern latitude
SA	Sand
SE	South-east
SEV	Severe *(used e.g. to qualify icing and turbulence reports)*
SFC	Surface
SG	Snow grains
SIGMET	Information concerning en-route weather phenomena which may affect the safety of aircraft operations
SN	Snow
SQ	Squalls
SQL	Squall line
SS	Sandstorm
SSE	South-Southeast
SSW	South-Southwest
STNR	Stationary
SW	South-west
TC	Tropical cyclone *(not required in the EUR Region)*
TCU	Towering Cumulus
TO	To … *(place)*
TOP	Cloud top
TS	Thunderstorm
TSGR	Thunderstorm with hail
TURB	Turbulence
UIR	Upper flight information region
VA	Volcanic ash
VALID*	Valid
VIS	Visibility
W	West *or* western longitude
WI	Within
WID	Width
WKN	Weaken *or* weakening
WNW	West-Northwest
WSW	West-Southwest
Z	Coordinated Universal Time *(used in meteorological messages)*

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

---APPENDIX B---

List of EUR SIGMET (WS/LS, WV/LV) and AIRMET (WA/LW) headers

Note that updates to Appendix B is provided at the following website: http://www.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> MET Guidance ---> Headers – EUR SIGMET and AIRMET). Note the **FIR indicator** must be in ICAO Doc 7910 (if not listed, the State will be reflected in non-implementation of SIGMET format).

APPENDIX C

Meteorological phenomena to be reported by SIGMET

Phenomenon	Description in TAC format	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[7] SEV ICE (FZRA)	Severe icing Severe icing due to freezing rain
Mountain wave (MTW)	SEV MTW[8]	Severe mountain wave
Duststorm (DS)	HVY DS[9]	Heavy duststorm
Sandstorm (SS)	HVY SS[9]	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*

*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);*
- *turbulence is considered severe whenever the peak value of the cube root of the eddy dissipation rate (EDR) exceeds 0.7.*

Guidance for SEV TURB can be found in WMO Aviation Hazards (AeM SERIES No. 3 (https://library.wmo.int/opac/doc_num.php?explnum_id=4555)).

A SIGMET for SEV TURB should be issued when observations and/or NWP outputs or other forecasts methods suggest a high probability of its occurrence. In addition, in the absence of other information, it is reminded that WAFC SIGWX charts can provide material to issue SIGMET for SEV TURB.

When SEV TURB is reported by pilots of heavy or medium aircraft (if type known) and the forecaster considers that the phenomenon is not of transient nature and therefore expected to persist, SIGMET for SEV TURB should be issued. *Note that reference about aircraft types can be found in ICAO Doc 4444 PANS-ATM 16th Edition (2016) Part 4.9.1.1.*

The issuance of SIGMET for SEV TURB is recommended when light-sized aircraft measure EDR of 0.70 or greater as per Annex 3, Appendix 4, 2.6.2 (anticipated to be 0.45 for medium aircraft in 2020 subject to approval), noting that light aircraft can experience severe turbulence with EDR lower than this value.

7. Guidance for SEV ICE can be found in WMO Aviation Hazards (AeM SERIES No. 3 (https://library.wmo.int/opac/doc_num.php?explnum_id=4555)).

*8. 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.*

9. Sandstorm/duststorm should be considered heavy whenever the visibility is below 200 m and the sky is obscured.

APPENDIX D

Meteorological phenomena to be reported by AIRMET

Phenomenon[1]	**Description in TAC format**	**Meaning**
Surface wind	SFC WIND (+wind direction, speed and units)	Widespread[2] mean surface wind direction with mean speed above 15 m/s (30 kt)
Surface visibility	SFC VIS (+visibility) (+ one of the weather phenomena causing the reduction of visibility)	Widespread[2] areas affected by reduction of visibility to less than 5 000 m, including the weather phenomenon causing the reduction of visibility
Thunderstorm	ISOL[3]TS OCNL[4]TS ISOL[3] TSGR OCNL[4] TSGR	Isolated thunderstorm(s) Occasional thunderstorm(s) Isolated thunderstorm(s) with hail Occasional thunderstorm(s) with hail
Mountain obscuration	MT OBSC[5]	Mountains obscured
Cloud	BKN CLD (+height) OVC CLD (+height) ISOL[3] CB OCNL[4] CB FRQ[6] CB ISOL[3] TCU OCNL[4] TCU FRQ[6] TCU	Widespread[2] areas of broken cloud Widespread[2] areas of overcast cloud Isolated CB Occasional CB Frequent CB Isolated TCU Occasional TCU Frequent TCU
Icing	MOD[7] ICE	Moderate icing
Turbulence	MOD[8] TURB	Moderate turbulence
Mountain wave	MOD[9] MTW	Moderate mountain wave

Notes:

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

2. The term "widespread" is used to indicate a spatial coverage of more than 75 percent of the area concerned. (reference: EUR eANP, VOLUME II, PART V – METEOROLOGY,EXAMPLE FOR SPECIFIC REGIONAL REQUIREMENTS)

*3. Isolated (**ISOL**) indicates that an area of thunderstorms, or cumulonimbus cloud, or towering cumulus cloud, consists of individual features which affect, or are forecast to affect, an area with a maximum spatial coverage less than 50 per cent of the area concerned (at a fixed time or during the period of validity)*

*4. Occasional (**OCNL**) indicates that an area of thunderstorms, or cumulonimbus cloud, or towering cumulus cloud, consists of well-separated features which affect, or are forecast to affect, an area with a maximum spatial coverage between 50 and 75 per cent of the area concerned (at a fixed time or during the period of validity)*

*5. Mountain obscured (**MT OBSC**) should be used to indicate widespread mountain obscuration. (reference: EUR eANP, VOLUME II, PART V – METEOROLOGY,EXAMPLE FOR SPECIFIC REGIONAL REQUIREMENTS)*

*6. Frequent (**FRQ**) indicates an area of cumulonimbus cloud or towering cumulus cloud, within which there is little or no separation between adjacent CB or TCU clouds, 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)*

*7. Moderate (**MOD**) icing (**ICE**) should refer to icing in other than convective clouds.*

*8. 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);*
- *Turbulence is considered moderate whenever the peak value of the cube root of the eddy dissipation rate (EDR) is above 0.4 and below or equal to 0.7.*

*9. A mountain wave (**MTW**) is considered moderate (**MOD**) whenever an accompanying downdraft of 1.75–3.0 m/s (350–600 ft/min) and/or moderate turbulence is observed or forecast*

10. Mountainous area is an area of changing terrain profile where the changes of terrain elevation exceed 900 m (3 000 ft) within a distance of 18.5 km (10.0 NM)

APPENDIX E

Guidelines for reporting geographical coordinates in SIGMET and AIRMET in TAC format

When reporting geographical coordinates of points in SIGMET or AIRMET 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 – S0530 E09300

S05 E093 – N01 E095 – N12 E110 – S08 E103 – S05 E093

Note 1: The points of a polygon should be provided in a clockwise order, and the end point should be a repeat of the start point.

Note 2: In the case of volcanic ash cloud or tropical cyclone 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.

———————

Appendix F, EUR/NAT SIGMET test focal points can be accessed at http://www.icao.int/EURNAT/Pages/welcome.aspx - EUR/NAT Documents; EUR Documents; MET Guidance; EUR/NAT SIGMET test focal points

APPENDIX G

SIGMET EXAMPLES

*Note. —The figures used in this appendix are intended simply to clarify the intent of the SIGMET message in abbreviated plain language (TAC), and therefore how each SIGMET should be **constructed** by MWOs and also **interpreted** by users. The figures used are not intended to give guidance on how a SIGMET in graphical format should be produced.*

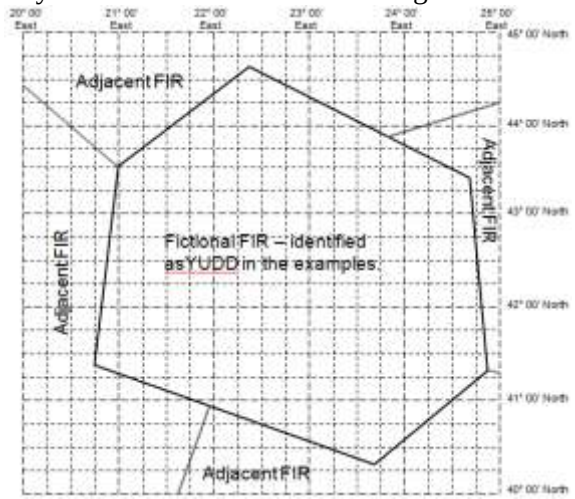
Examples of '**WS**' SIGMET. See the sections for SIGMET for volcanic ash only (WV) and SIGMET for tropical cyclone only (WC) for examples specific to those phenomena.

Contents

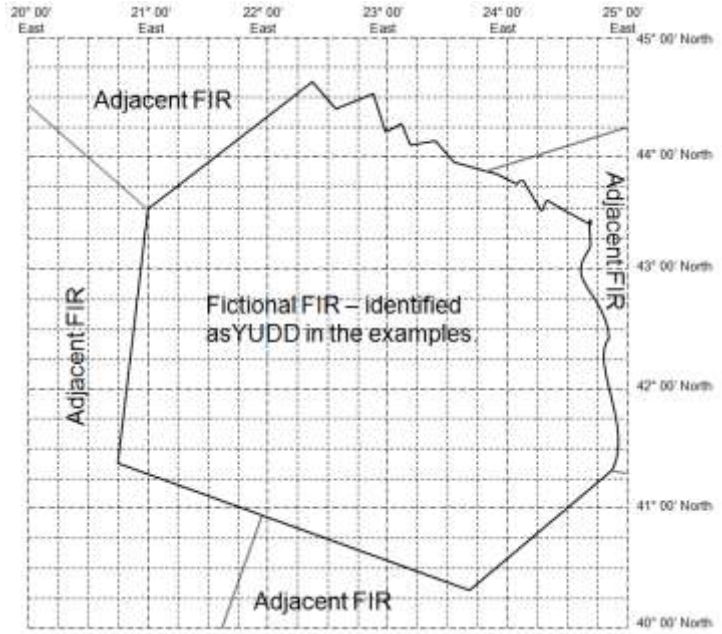
General

In the following paragraphs, some examples of SIGMET are provided in TAC format.
Explanation of fictional FIR.

In each of the examples below, a fictional FIR area is indicated, with portions of adjacent fictional FIRs also indicated. The FIR areas are overlaid on a coordinate grid, in order that the example plain language SIGMETs can be explicitly related to the intended meaning.



For some cases, examples are given where the FIR has boundaries that are complex (country borders for example, especially when defined by rivers)



Fictional FIR ‘Shanlon = YUDD’ is used for the examples.

Repetition of start point as last coordinate.

In accordance with practices and procedures laid down for other aeronautical bulletins (i.e. NOTAM), it is recommended that the last point of a polygon is a repeat of the first point of the polygon. This will ensure that the polygon has been closed, and that no points have been accidentally omitted.

'Direction' of encoding of the points of a polygon

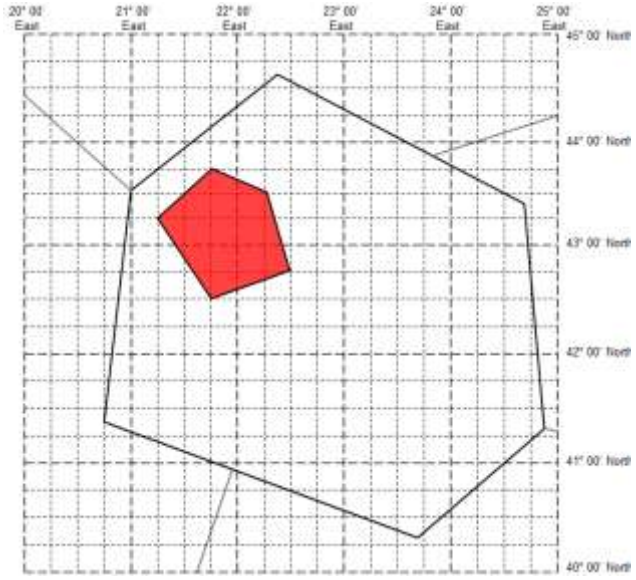
In accordance with practices and procedures laid down for other aeronautical bulletins and international practice (e.g. BUFR encoding of WAFS significant weather (SIGWX) forecasts), it is recommended that the points of a polygon are provided in a 'clockwise' sense. This assists automated systems in determining the 'inside' of polygons.

Use of ‘Expected Movement’ and ‘Forecast Position’/’Forecast Time’.

With applicability of Amendment 77, the ‘Expected Movement’ element of SIGMET should not be used if the ‘Forecast Position’/’Forecast Time’ element is being used, and vice versa. This is to prevent duplication at best and inconsistencies at worst.

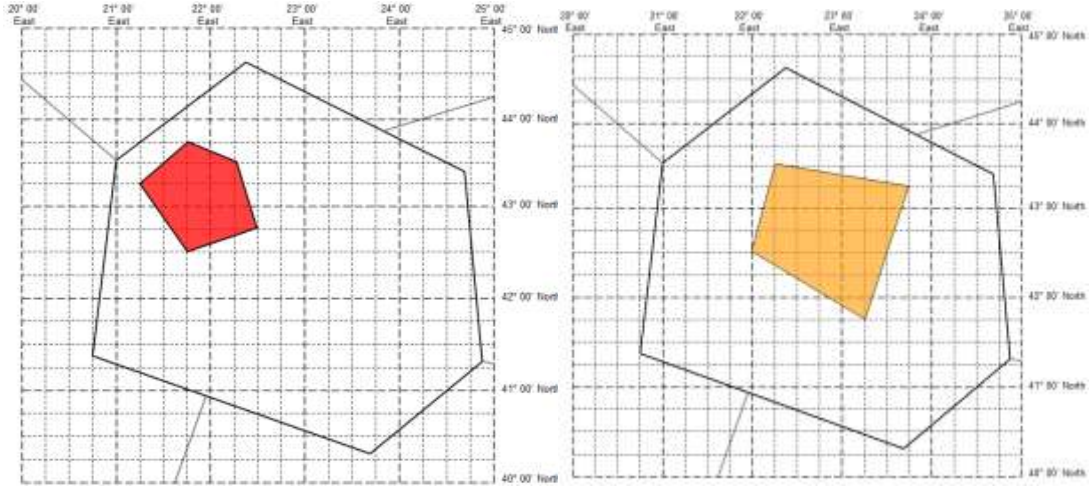
1) An area of the FIR defined by a polygon. The end point should be a repeat of the start point. Points of a polygon are provided in a 'clockwise' sense.

When the SIGMET does not include a 'forecast position' section.



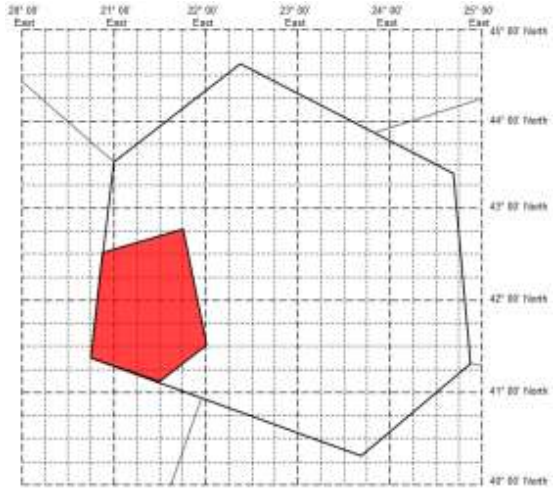

```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02145 - N4315 E02115 - N4345 E02145 - N4330 E02215 - N4245 E02230 -
N4230 E02145 FL250/370 MOV ESE 20KT INTSF=
```

With an explicit forecast position:



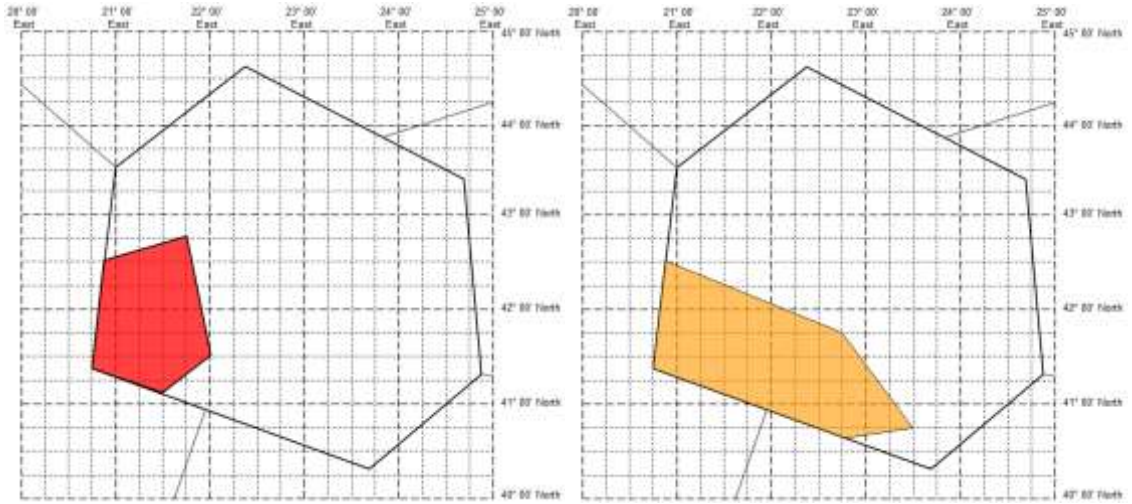
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02145 – N4315 E02115 – N4345 E02145 – N4330 E02215 – N4245 E02230 - N4230 E02145 FL250/370 INTSF FCST AT 1600Z WI N4145 E02315 – N4230 E02200 – N4330 E02215 – N4315 E02345 - N4145 E02315=

When the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02052 – N4245 E02145 – N4130 E02200 – N4107 E02130 – N4123 E02045 – N4230 E02052 FL250/370 MOV SE 30KT WKN=

With an explicit forecast position:



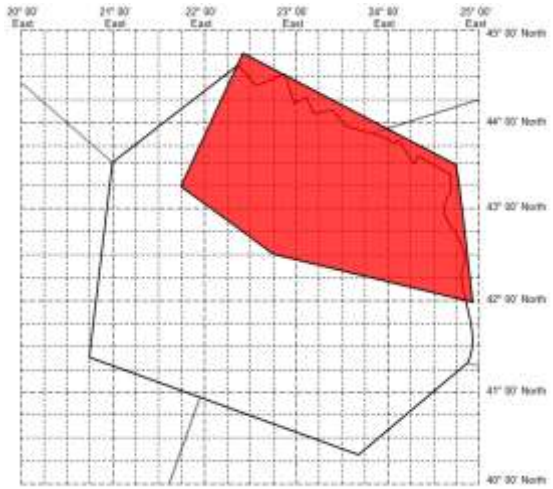
```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02052 - N4245 E02145 - N4130 E02200 - N4107 E02130 - N4123 E02045-
N4230 E02052 FL250/370 WKN FCST AT 1600Z WI N4230 E02052 - N4145 E02245 - N4045 E02330 - N4040 E02248 - N4123
E02045- N4230 E02052=
```

Use of polygons with complex FIR boundaries.

Annex 3 (19th Edition, July 2016) specifies that the points of a polygon '... should be kept to a minimum and should not normally exceed seven'. However, some FIR boundaries are complex, and it would be unrealistic to expect that a polygon would be defined that followed such boundaries precisely. As such, some States have determined that the polygon points be chosen in relation to the complex boundary such that the FIR boundary approximates, but is wholly encompassed by, the polygon, and that any additional area beyond the FIR boundary be the minimum that can be reasonably and practically described. Caution should however be exercised in those instances where international aerodromes are located in close proximity to such a complex FIR boundary.

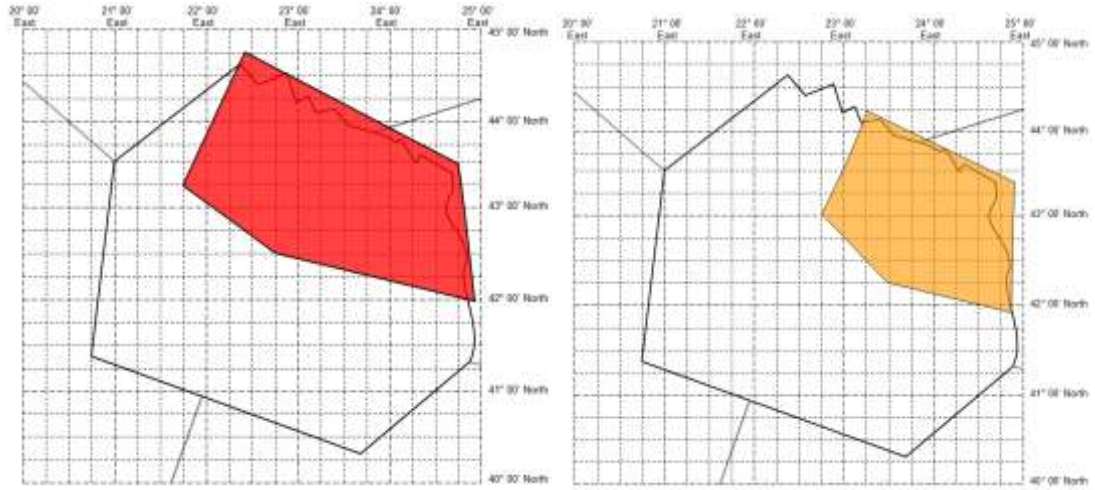
In the examples below, it would not be practical to follow the northeastern boundary of the FIR exactly. The point close to N4330 E02245 is obviously a 'major' turning point along the FIR boundary, but the other, numerous and complex turning points can only be approximated when constrained to seven points.

When the SIGMET does not include a ‘forecast position’ section.



```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4315 E02145 - N4445 E02245 - N4330 E02445 - N4200 E02455 - N4230 E02245-
N4315 E02145 FL250/370 MOV SE 20KT WKN=
```

With an explicit forecast position:

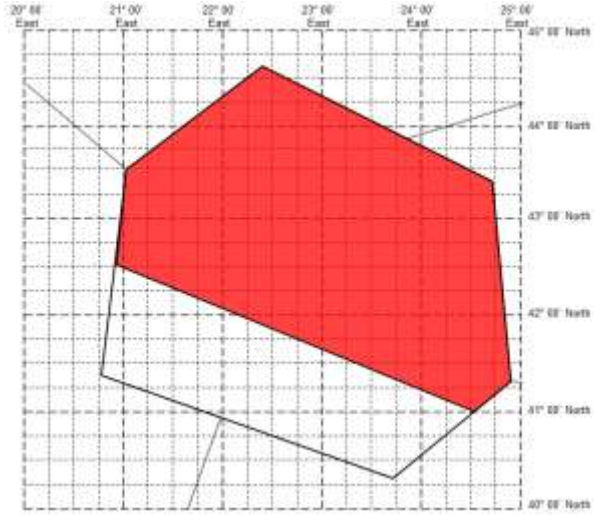


YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4315 E02145 – N4445 E02245 – N4330 E02445 – N4200 E02455 – N4230 E02245-
N4315 E02145 FL250/370 WKN FCST AT 1600Z WI N4300 E02245 – N4415 E02315 – N4322 E02452 – N4155 E02445 – N4215
E02330- N4300 E02245=

2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and end points on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point).

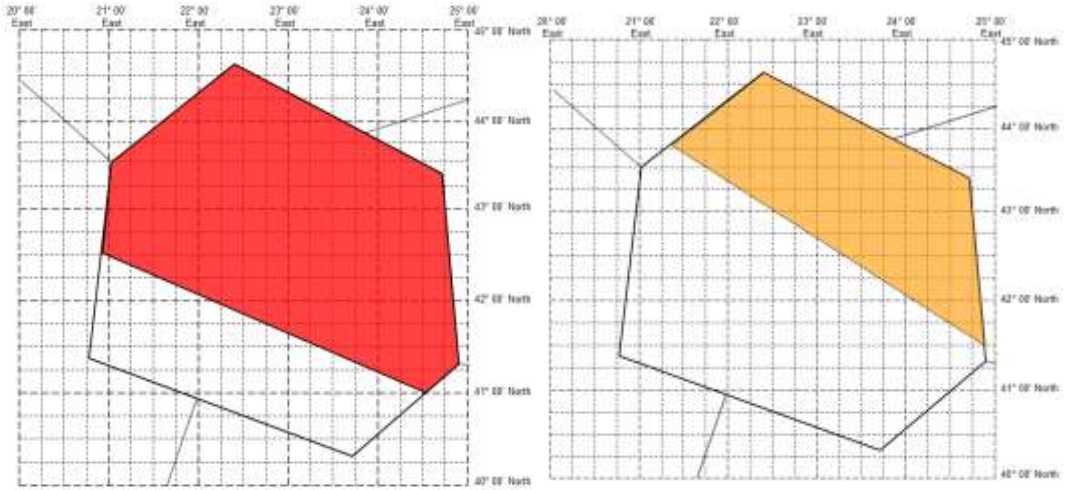
The specified points shall be on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point)

When the SIGMET does not include a ‘forecast position’ section.



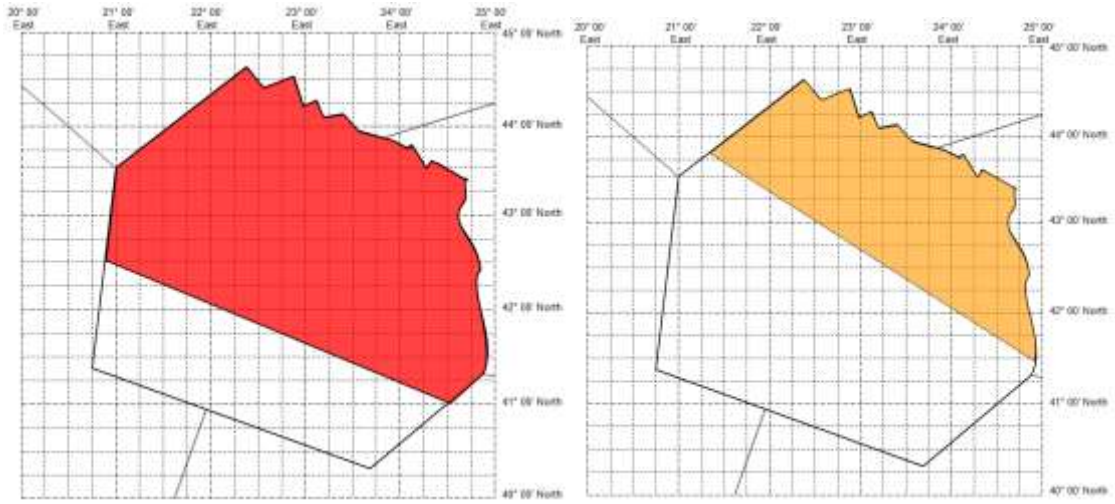
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 - N4100 E02430 FL250/370 MOV NE 15KT WKN=

With an explicit forecast position:



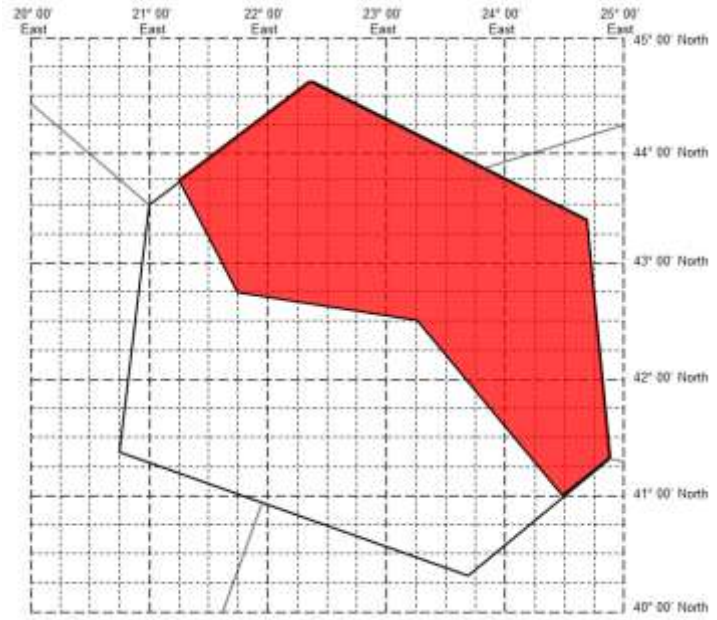
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 – N4100 E02430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4346 E02122 – N4130 E02452=

A separate example is provided below illustrating a case where the north eastern boundary is complex.



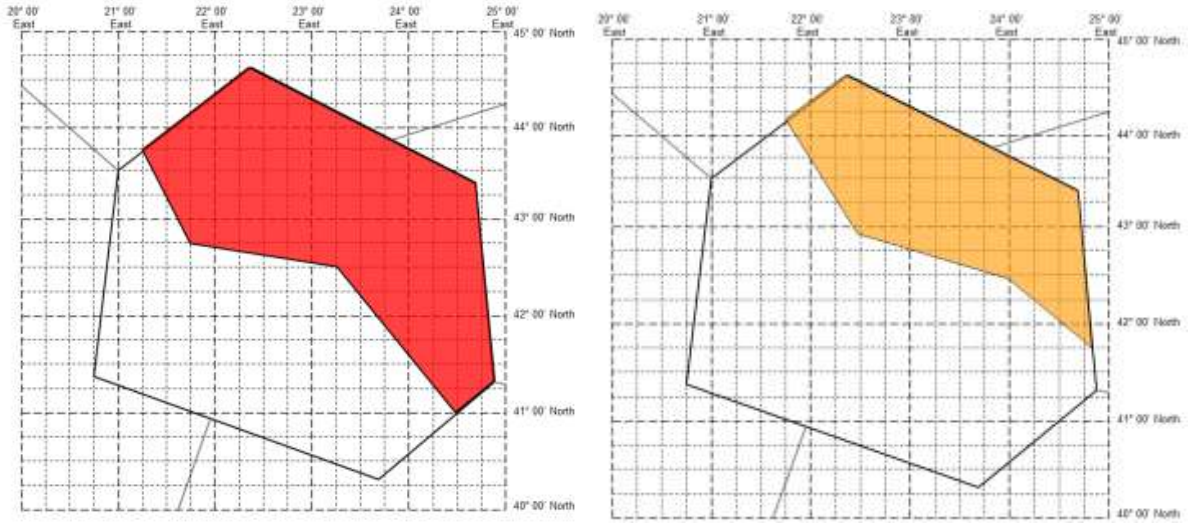
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 - N4100 E02430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4346 E02122 - N4130 E02457=

For a series of connected lines when the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4345 E02115 – N4245 E02145 - N4230 E2315 – N4100 E2430 FL250/370 MOV NE 20KTWKN=

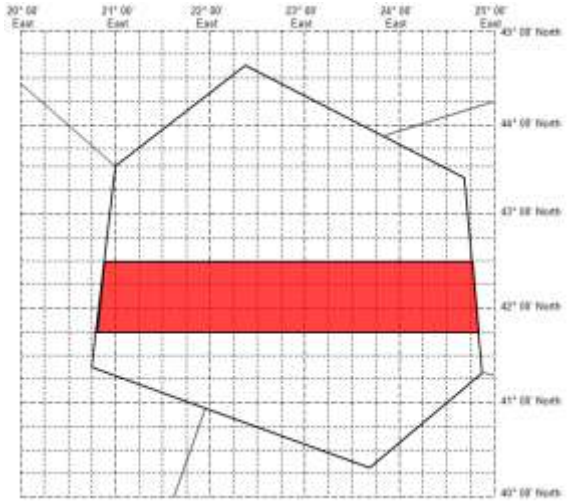
With an explicit forecast position:




```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4345 E02115 - N4245 E02145 - N4230 E2315 - N4100 E2430 FL250/370 WKN
FCST AT 1600Z NE OF LINE N4411 E02145 - N4255 E02228 - N4228 E2400 - N4130 E2450=
```

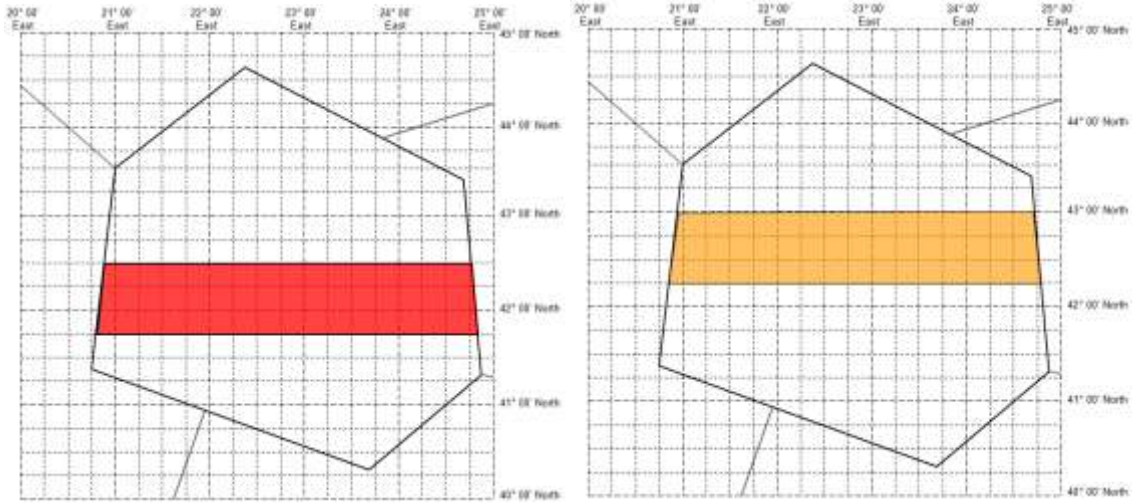
2b) In a sector of the FIR defined as being *between* two lines of latitude, or between two lines of longitude.

When the SIGMET does not include a ‘forecast position’ section.



```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST N OF N4145AND S OF N4230 FL250/370 MOV N 30KT WKN=
```

With an explicit forecast position:



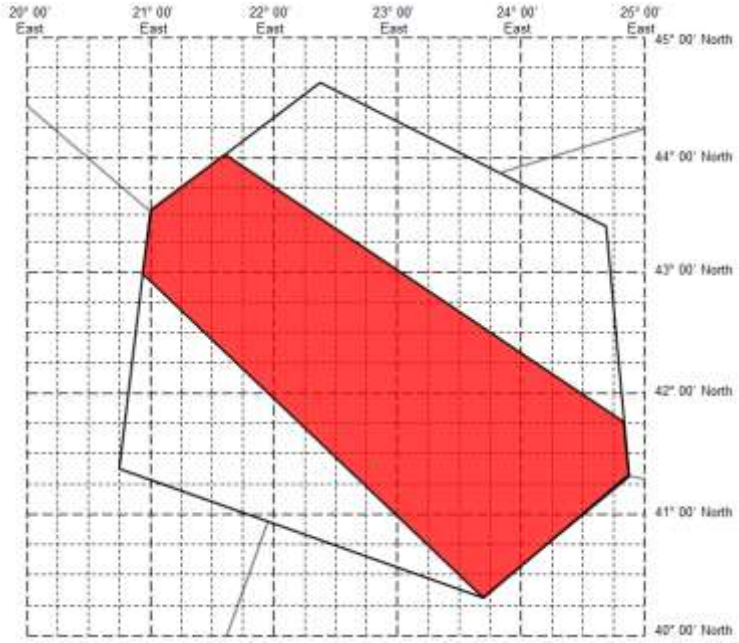
```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST N OF N4145AND S OF N4230 FL250/370 WKN FCST AT 1600Z N OF N4215AND S OF N4300=
```

(similar constructions can be used for specifying areas between lines of longitude)

2c) In a sector of the FIR defined as being *between* two specified lines, or *between* two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points).

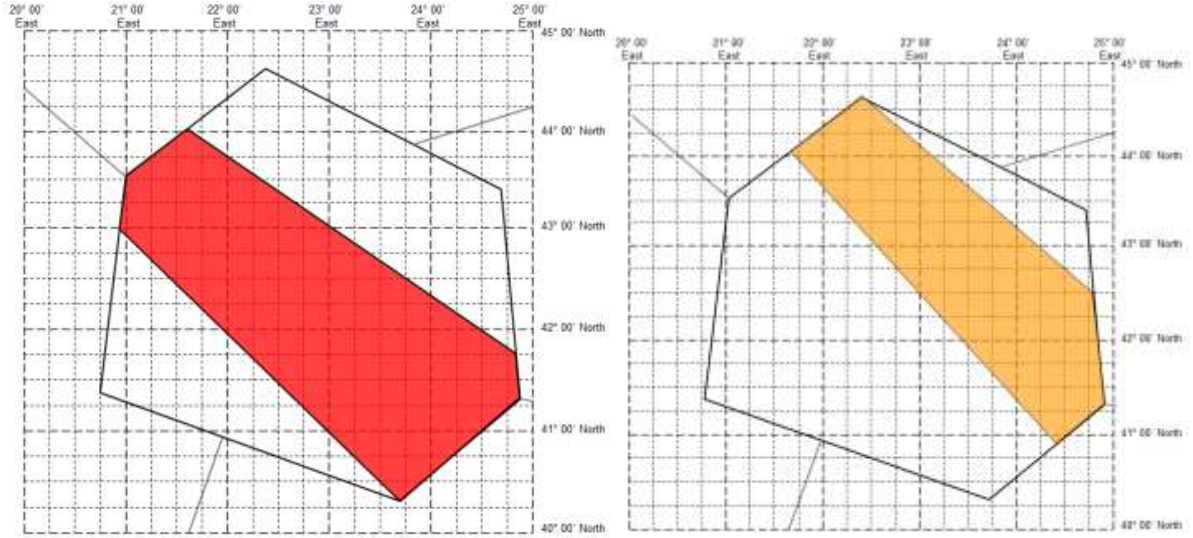
The specified points shall be on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point)

When the SIGMET does not include a ‘forecast position’ section.



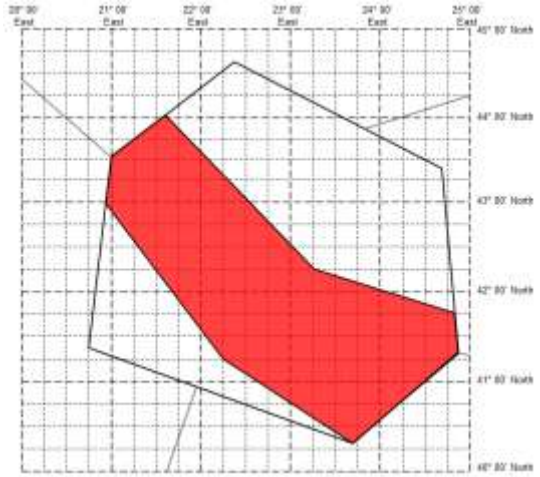
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 - N4020 E02340 AND SW OF LINE N4402 E02142 - N4145 E02450FL250/370 MOV NE 20KTWKN=

With an explicit forecast position:



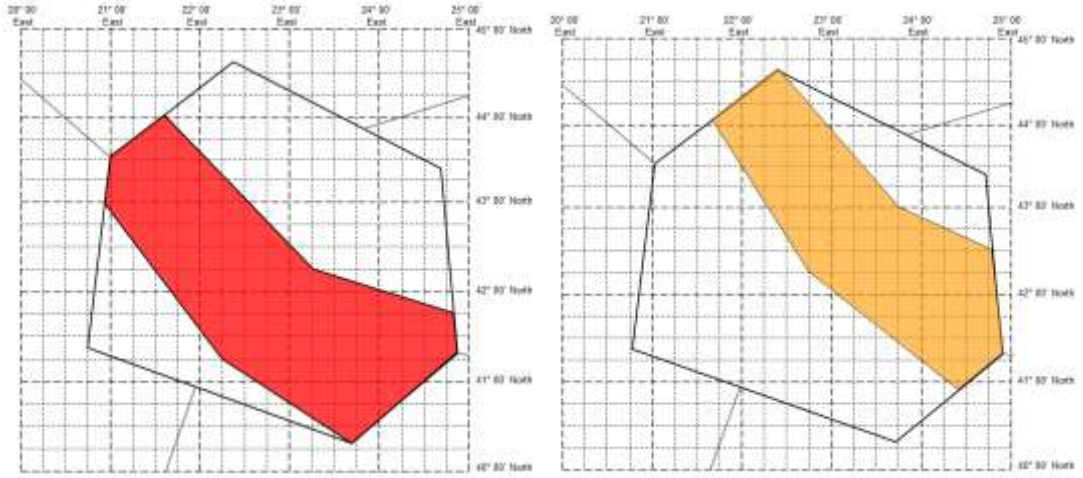
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 - N4020 E02340 AND SW OF LINE N4402 E02142 - N4145 E02450
FL250/370 WKN FCST AT 1600Z NE OF LINE N4403 E02140 - N4055 E02422AND SW OF LINE N4437 E02222 - N4230 E02447=

For a series of connected lines when the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057– N4115 E02215 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4215 E02315 - N4145 E02450 FL250/370 MOV NE 20KT WKN=

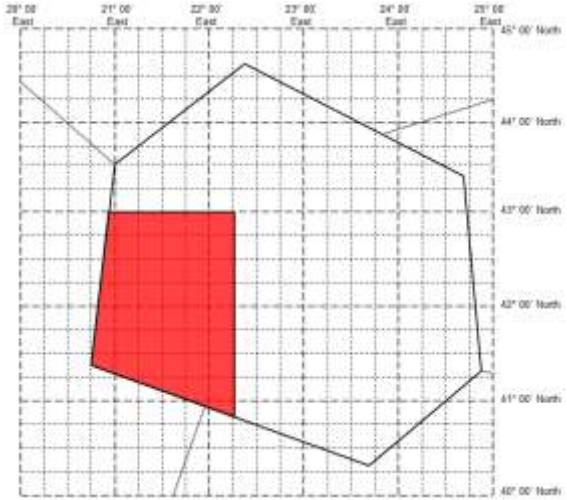
With an explicit forecast position:



YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 - N4115 E02215 - N4020 E02340 AND SW OF LINE N4402 E02142 - N4215 E02315 - N4145 E02450 FL250/370 WKN FCST AT 1600Z NE OF LINE N4403 E02140 - N4215 E02245 - N4055 E02422 AND SW OF LINE N4437 E02222 - N4300 E02345 - N4230 E02447=

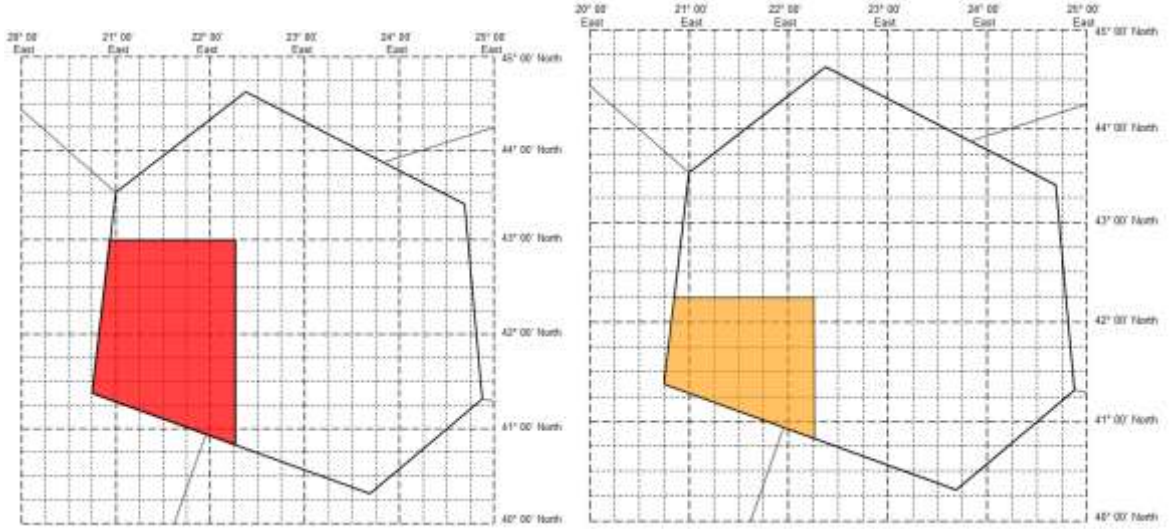
2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant)

When the SIGMET does not include a ‘forecast position’ section.



```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST S OF N4300 AND W OF E02215 FL250/370 MOV S 12KT WKN=
```

When the SIGMET does include a ‘forecast position'.

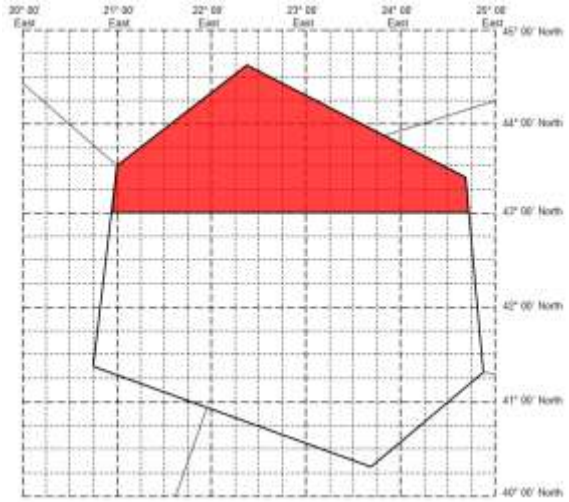


With an explicit forecast position:

```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST S OF N4300 AND W OF E02215 FL250/370 WKN FCST AT 1600Z S OF N4215 AND W OF
E02215=
```

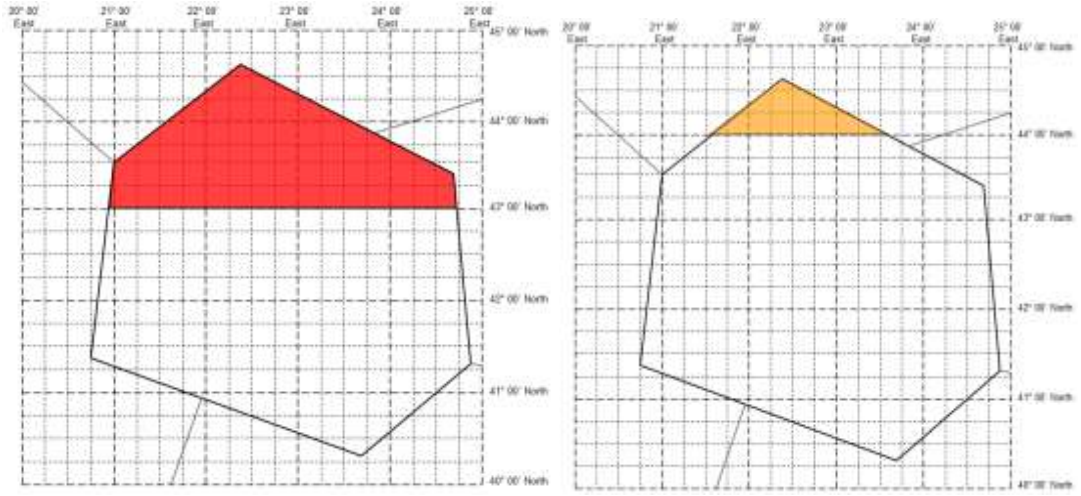
2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment).

When the SIGMET does not include a ‘forecast position’ section.



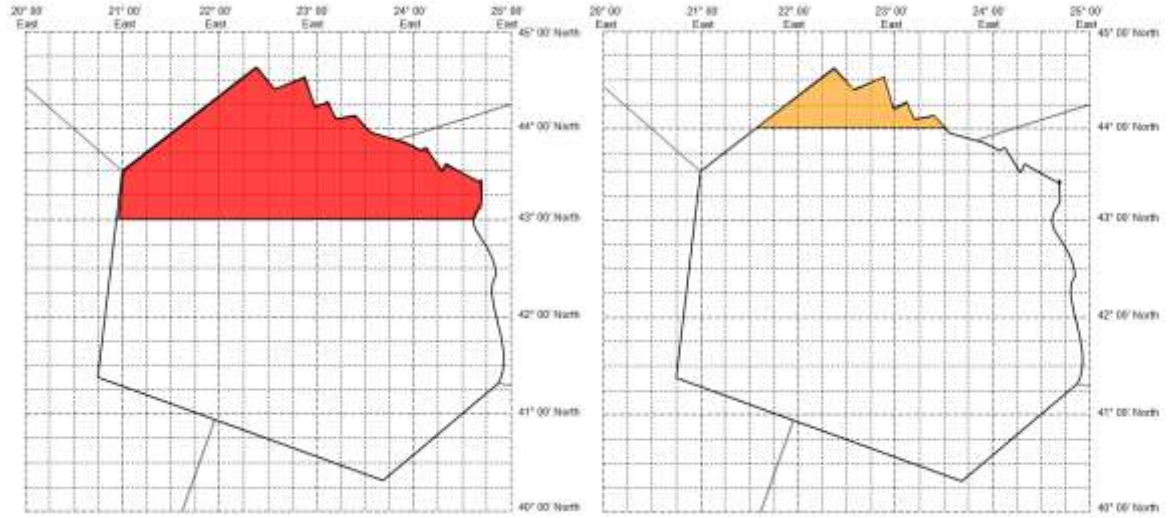
```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43 FL250/370 MOV N 15KT WKN=
```

When the SIGMET does include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43[1] FL250/370 WKN FCST AT 1600Z N OF N44=

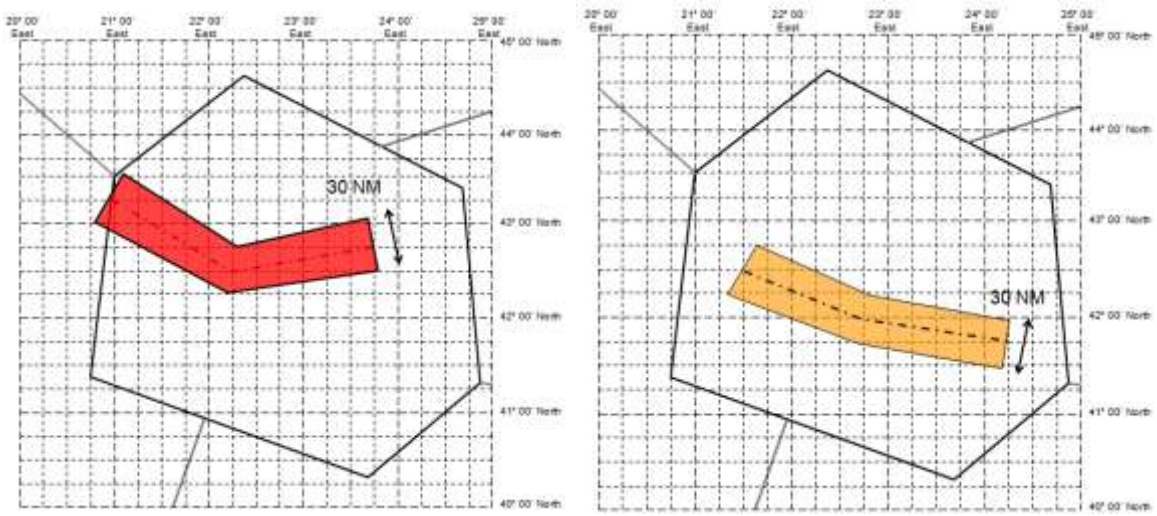
[1] It would be equally valid to use 'N4300'.



```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43[2] FL250/370 WKN FCST AT 1600Z N OF N44=
```

[2] It would be equally valid to use 'N4300'.

3) Defined by a 'corridor' of specified width, centred upon the line described.

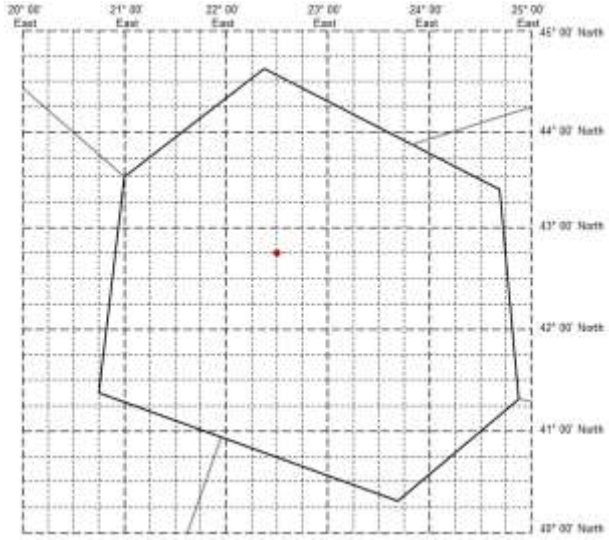


YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST APRX 30NM WID LINE BTN N4315 E02100 - N4230 E02215 - N4245 E02345 FL250/370 WKN FCST AT 1600Z APRX 30NM WID LINE BTN N4230 E02130 - N4200 E02245 - N4145 E02415=

Note: The nature of this option means that, as at N4315 E02100, it is inferred that there is some encroachment into the neighbouring FIR.

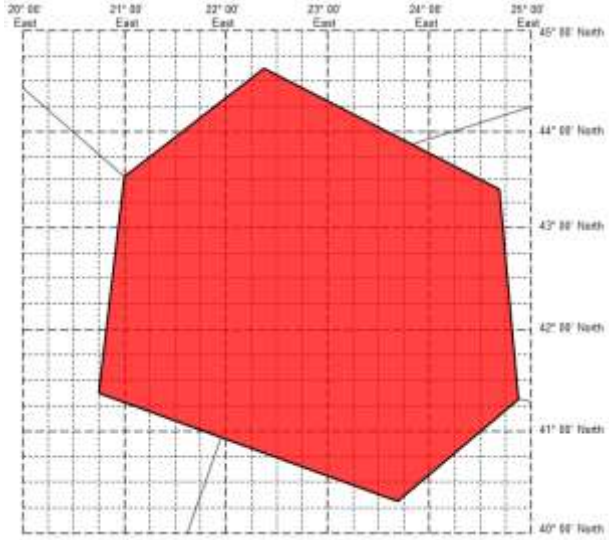
4) At a specific point within the FIR;

When the SIGMET does not include a ‘forecast position’ section.




```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB OBS N4245 E02230 FL250/370 STNR WKN=
```

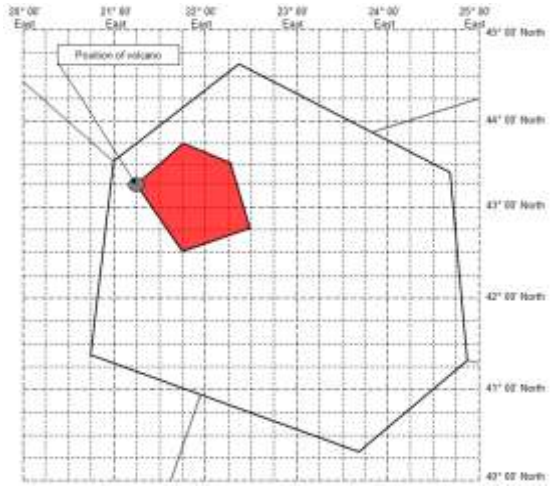
5) Covering entire FIR.




```
YUDD SIGMET 2 VALID 101200/101600 YUSO -
YUDD SHANLON FIR/UIR VA CLD FCST AT 1200Z ENTIRE FIR FL250/370 STNR WKN=
```

6) Additional examples using volcanic ash references applicable to volcanic ash SIGMET only.

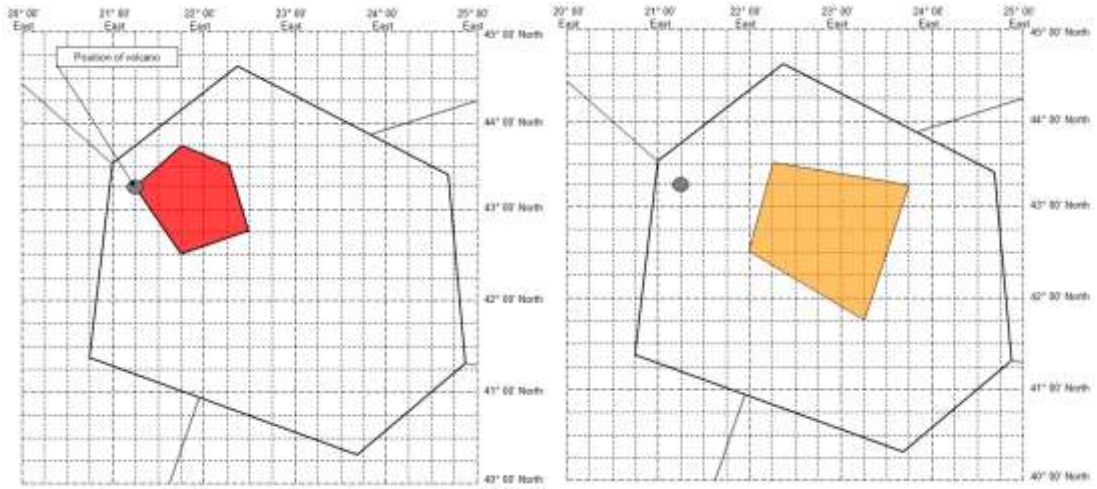
When the VA SIGMET does not include a 'forecast position' section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 - N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 MOV ESE 20KT NC=

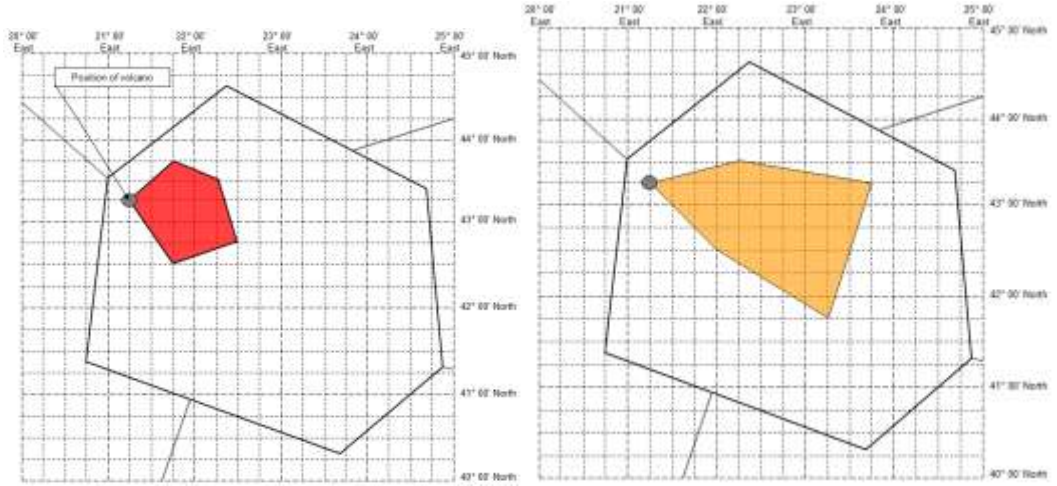
When the SIGMET does include a ‘forecast position’ section (no rate of movement).

For VA (eruption ceased, ash cloud persists downwind):



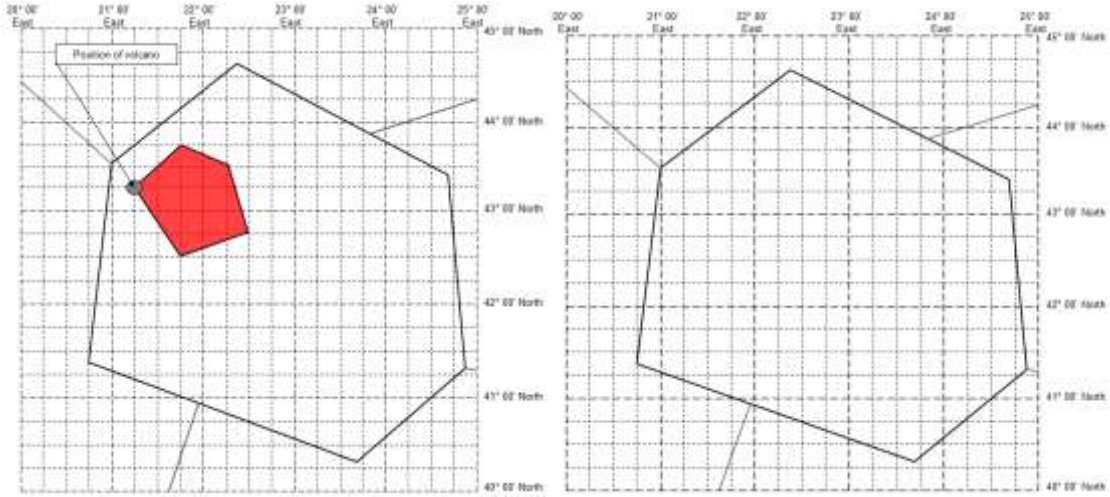
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 NC FCST AT 1800Z WI N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 - N4330 E02215=

For VA (eruption on-going):



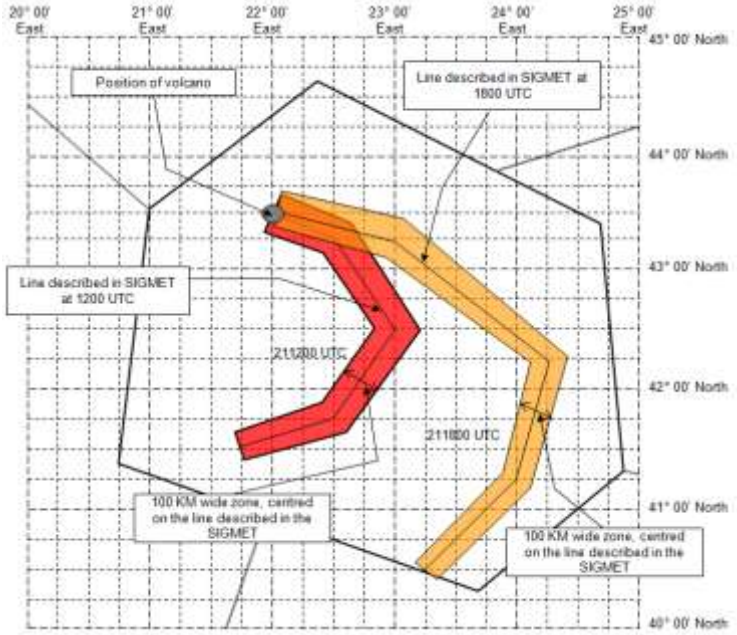
YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 - N4345 E02145 – N4330 E02215 – N4245 E02230 – N4230 E02145 – N4315 E2115 FL250/370 NC FCST AT 1800Z WI N4315 E02115 - N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 – N4315 E02115=

For VA (eruption ceasing, ash dispersing):




```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 - N4345 E02145 - N4330
E02215 - N4245 E02230 - N4230 E02145 - N4315 E02115 FL250/370 WKN FCST AT 1800Z NO VA EXP=
```

For VA (eruption on-going), defining the area affected as a corridor of specified width;

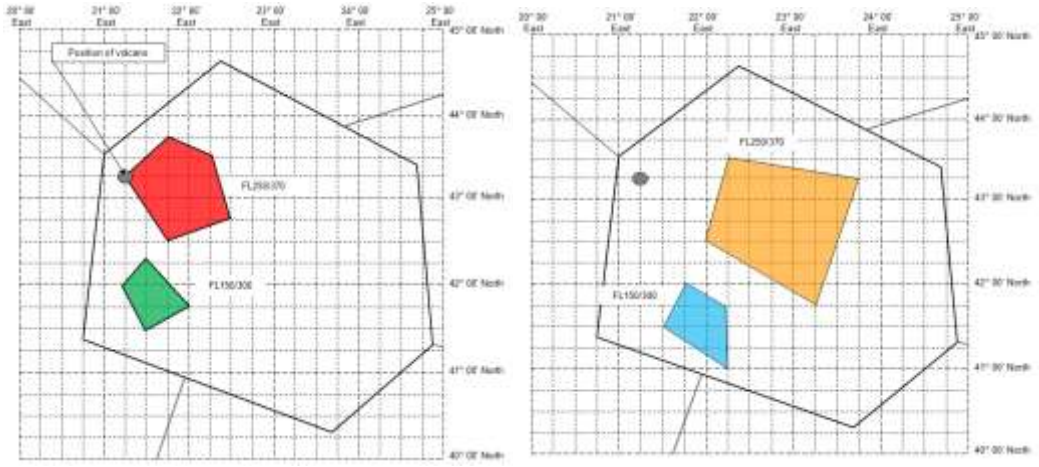


YUDD SIGMET 2 VALID 211200/211800 YUSO –
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4330 E02200 VA CLD FCST AT 1200Z APRX 100KM WID LINE BTN N4330 E02200 – N4315 E02230 – N4230 E02300 – N4145 E02230 – N4130 E02145 FL310/450 NC FCST AT 1800Z APRX 100KM WID LINE BTN N4330 E02200 – N4315 E02300 – N4215 E02415 – N4115 E02400 – N4030 E02315=

7) Additional examples using volcanic ash references applicable to multiple areas in SIGMET for volcanic ash.

The only way to include a second instance of a volcanic ash cloud in a SIGMET message is to use the 'AND' option after the 'Forecast position' section.

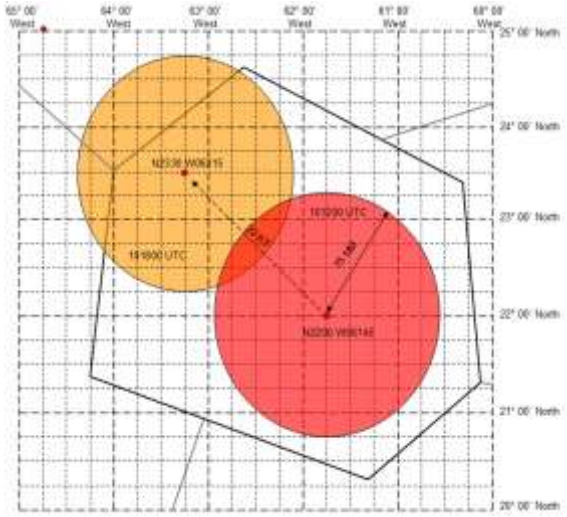
In the example below, two areas of volcanic ash cloud (at different levels) are forecast to move as described. The normal courier font refers to the northernmost areas of ash, and the italicised font refers to the southernmost areas of ash during the period. 'AND' is highlighted in **bold** to identify the separation of the two features.



YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 - N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 NC FCST AT 1800Z WI N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 - N4330 E02215 **AND WI** *N4200 E02115 – N4217 E02130 – N4145 E02200 – N4130 E02130 – N4200 E02115 FL150/300 NC FCST AT 1800Z WI N4200 E02145 – N4145 E02215 – N4100 E02215 – N4130 E02130 – N4200 E02145=*

The above only works if there are two instances of ash at the start and end of the period. If the number of ash areas is different at the start and end, it is recommended that separate SIGMETs be issued as necessary.
It is worth noting that formats of volcanic ash SIGMET (WV) issued by the MWOs and volcanic ash advisories (VAA) issued by the VAACs are clearly distinct. Template for VAA can be found in Appendix 2 of Annex 3 (Table A2-1).

8) Additional example illustrating use of "WI nnnKM (or nnnNM) OF TC CENTRE " in Tropical Cyclone SIGMET only



```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 75NM OF TC CENTRE TOP BLW FL500 MOV NW 20KT WKN=
```

```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 75NM OF TC CENTRE TOP BLW FL500 WKN FCST AT 1800Z
TC CENTRE PSN N2330 W06315=
```

It is acceptable to use the other 'Location' options to describe the area affected by the CB of a Tropical Cyclone:

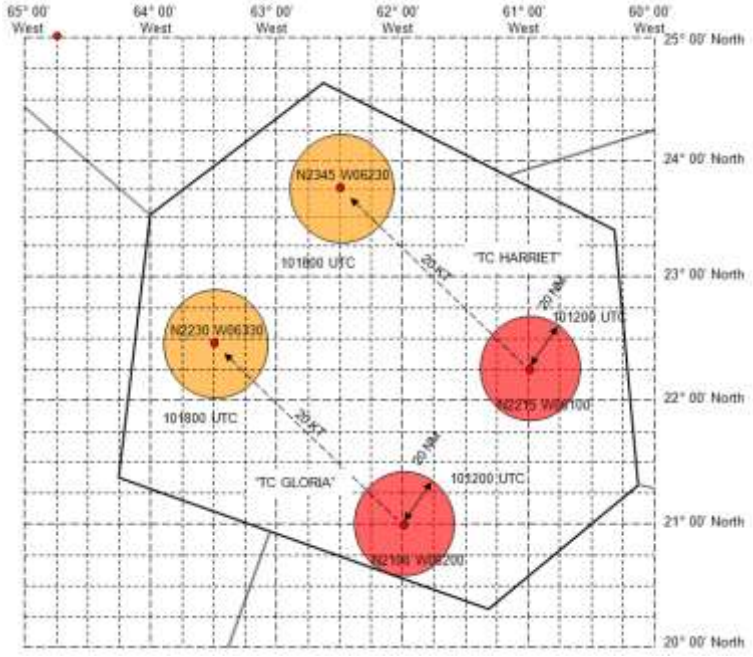

```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI N2200 W06200 - N2230 W06215 - N2300 W06200 - N2245
W06245 - N2215 W06245 - N2145 W06230 - N2200 W06200 TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE PSN N2330 W06315=
```

However, the current template only permits this for the initial location. The 'forecast position' for TC can only be specified as the location of the TC centre.

9) Additional example using tropical cyclones references applicable to multiple areas in SIGMET for tropical cyclone.

The only way to include a second instance of a tropical cyclone in a SIGMET is to use the 'AND' option following the 'Forecast position' section.

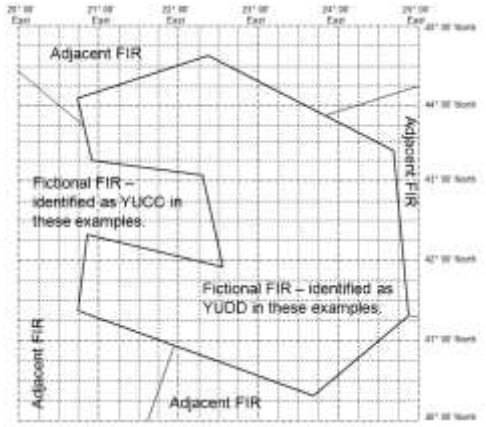
The example below demonstrates how two separate TCs, and the CB within a specified radius of those TCs, can be described. The normal courier font refers to TC Gloria, and the italicised font refers to TC Harriet. 'AND' is highlighted in **bold** to identify the separation between information for the two features.



YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2100 W06200 CB OBS AT 1200Z WI 20NM OF TC CENTRE TOP FL500 MOV NW 20KT WKN FCST AT 1800Z TC CENTRE N2230 W06330 **AND** *TC HARRIET FCST AT 1200Z N2215 W06100 CB TOP FL400 WI 20NM OF CENTRE WKN FCST AT 1800Z TC CENTRE N2345 W06230*=

10) Additional examples of SIGMETs relating to ‘concave’ or ‘horseshoe’ shaped FIRs.

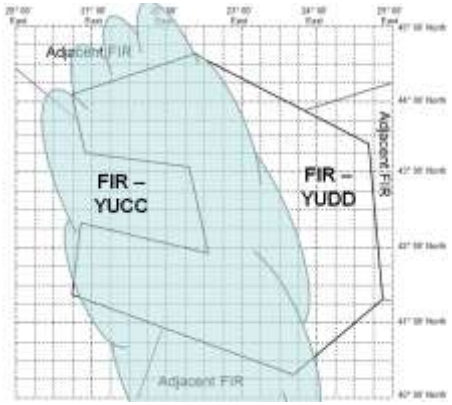
There are examples of FIRs that partially surround adjacent FIRs and are what might be described as concave or 'horseshoe' shaped. An example is given below.



1. Figure 1: Fictional example of a complex 'concave' FIR – YUDD, partially surrounding FIR - YUCC[3]

The question arises as to how to encode a SIGMET under circumstances where the hazard affects the outer FIR (YUDD in this case) and the FIR that is partially enclosed (YUCC in this case).

[3] YUDD and YUCC used in this paper are fictional FIRs



2. Figure 2: Fictional example of a complex 'concave' FIR – YUDD partially surrounding FIR – YUCC when both are affected by a meteorological hazard

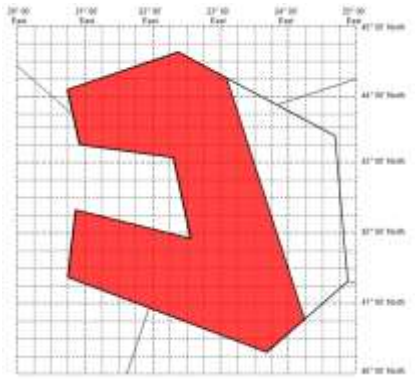
With due regard to removing any possible ambiguity, and also with regard to consistency with protocols for IWXXM versions of SIGMET, the following best practice for the EUR region is provided.

In these examples, it is taken as accepted that MWOs are coordinating their SIGMETs. The clarification sought is how the SIGMET (or AIRMET) should be compiled for an FIR that partially surrounds another FIR.

In the examples below, the area indicated in red is taken as representing the meteorological hazard.

Example 1)

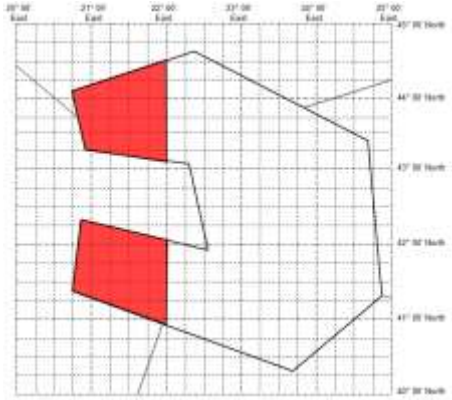
In this example, it is considered that the situation below could be encoded as a single, simple SIGMET. Users would be expected to interpret the SIGMET as indicating the area identified in red was affected by the hazard within the YUDD FIR.



YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST SW OF LINE N4415 E02305 - N4045 E02415 FL250/370 MOV SW 15KT WKN=

Example 2)

In this example, in order to prevent any possible ambiguity and to prevent complications and inconsistencies with equivalent IWXXM versions of SIGMET then two separate SIGMETs should be issued.



In this case, the following is recommended:

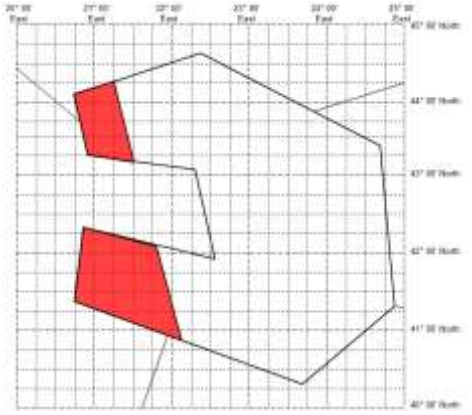
One SIGMET (northern extension of the 'horseshoe' shape)

```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST W OF LINE N4430 E02200 - N4307 E02200 FL250/370 MOV W 15KT WKN=
```

AND a second SIGMET (southern extension of the 'horseshoe' shape)

```
YUDD SIGMET 3 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST W OF LINE N4203 E02200 - N4058 E02200 FL250/370 MOV W 15KT WKN=
```

Where the line delineating the hazard is not a line of latitude or longitude, a similar process should be followed



One SIGMET (northern extension of the 'horseshoe' shape)

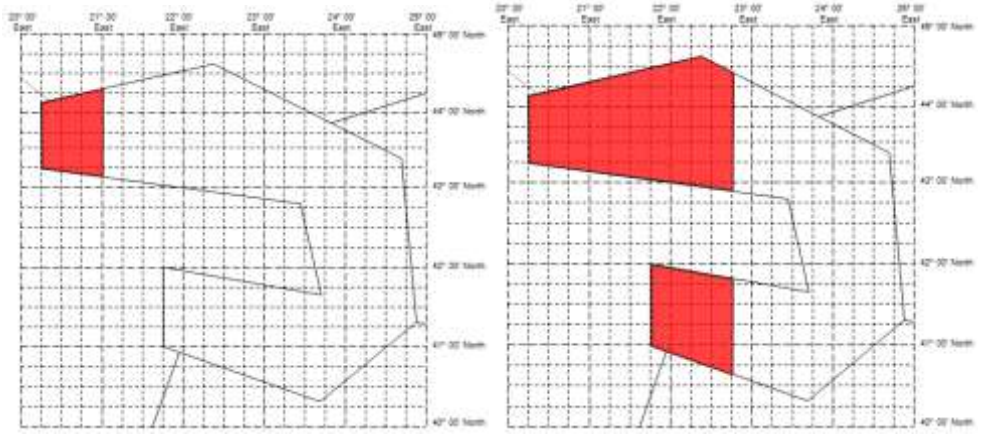
```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST SW OF LINE N4415 E02115 - N4312 E02130 FL250/370 MOV W 15KT WKN=
```

AND a second SIGMET (southern extension of the 'horseshoe' shape)

```
YUDD SIGMET 3 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST SW OF LINE N4205 E02147 - N4052 E02206 FL250/370 MOV W 15KT WKN=
```

Considering a concave, 'horseshoe' shaped FIR partially surrounding another FIR with 'legs' of very different size.

If the southern 'leg' is expected to be affected during the forecasted validity period, as the example below then 2 SIGMETs should be issued.



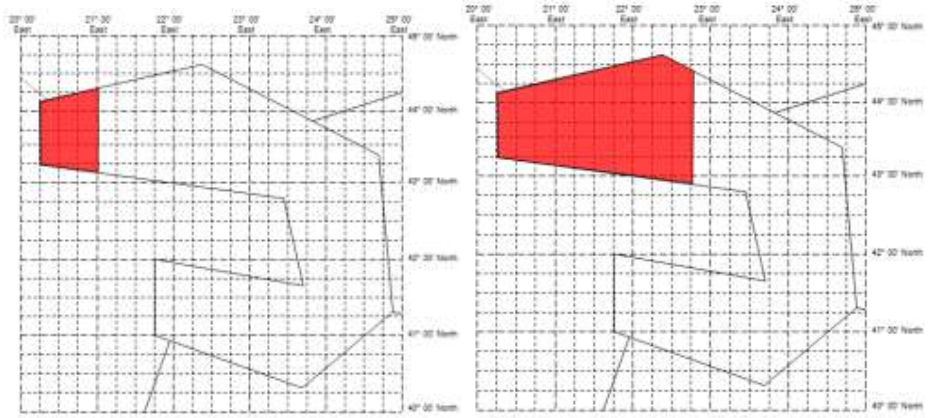
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z W OF LINE N4416 E02100 - N4307 E02100 FL250/370 WKN FCST 1600Z W OF LINE N4427 E02245 - N4252 E02245=

And

```
YUDD SIGMET 3 VALID 101330/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST AT 1330Z W OF LINE N4200 E02145 - N4100 E02145 FL250/370 WKN FCST 1600Z W OF
LINE N4147 E02245 - N4038 E02245=
```

Note, the validity time (highlighted) of the second SIGMET commences sometime after that of the first since the southern exte nsion of the horseshoe shape is not as far west.

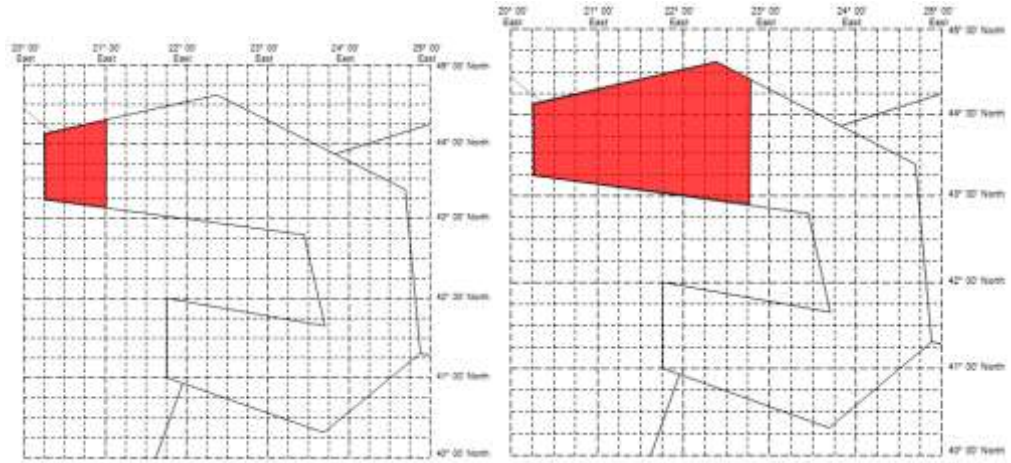
If the southern leg of the FIR is not expected to be affected, as in the example below,



Then a single SIGMET could be issued.

```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z W OF LINE N4415 E02100 - N4307 E02100 FL250/370 MOV E 25KT WKN=
```

However, to remove any possible doubt it is better to include an explicit forecast position,



```
YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z W OF LINE N4415 E02100 - N4307 E02100 FL250/370 MOV E 25KT WKN FCST
1600Z W OF LINE N4427 E02245 - N4252 E02245=
```

It should also be noted that in all of these examples relating to concave, horseshoe shaped FIRs, polygons could also be used to explicitly define the areas affected. The above examples are intended to show that the principle under such circumstances is that two SIGMETs should be issued. This, as noted, will prevent ambiguity and will permit straightforward translation of alphanumeric SIGMET into IWXXM versions of SIGMET.

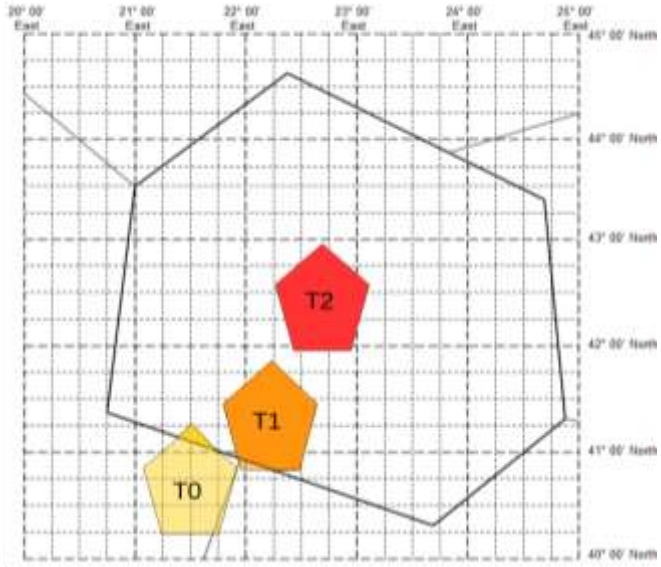
11) Additional examples for using FCST AT

Case 1) Using FCST AT with a different time from the one of validity period

In this example, a SIGMET is issued for a phenomenon born outside the FIR boundaries then moving and reaching the border of the FIR at time T0 (H0H0M0M0). Logically, the validity period of the SIGMET in that case would begin at the exact time (T0) when the phenomenon reaches the border of the FIR because the FIR is impacted from this moment (see Figure hereinafter).

The impact area at this starting time T0 can be not relevant to describe in the ***location*** of the phenomenon as only a small part of the FIR is impacted by the danger, in the worst case, only a single point. A possibility is then given by the mention FCST AT to describe the area covered by the phenomenon at a later time T1 (H1H1M1M1) when a significant part is already within the FIR and to use the element FCST AT to clarify the time when the location of phenomenon is described in the SIGMET.

This frequently occurs, generally with VA SIGMET as Volcanic Ash clouds move towards the FIR from the volcano area. Furthermore, describing the polygon of VA at given times (synoptic hours) allows to use directly the Volcanic Ash Advisory (VAA) information without having to perform extrapolations or interpolations.



YUDD SIGMET 1 VALID 101200/101800 YUSO-
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD
FCST AT 1400Z WI "POLYGON1" FL250/370 NC **FCST AT 1800Z WI**
"POLYGON2" =

Note : The time delay between T0 (start of validity period) and T1 (time of description of the phenomenon within the FIR) should be kept short, 1/2h or 1h maximum.

As a matter of fact, too long delays between these two times would lead to warn the users of a danger without giving precisions about it, which would be confusing.

Thus two possibilities are offered to the forecaster to describe the VA cloud movement:

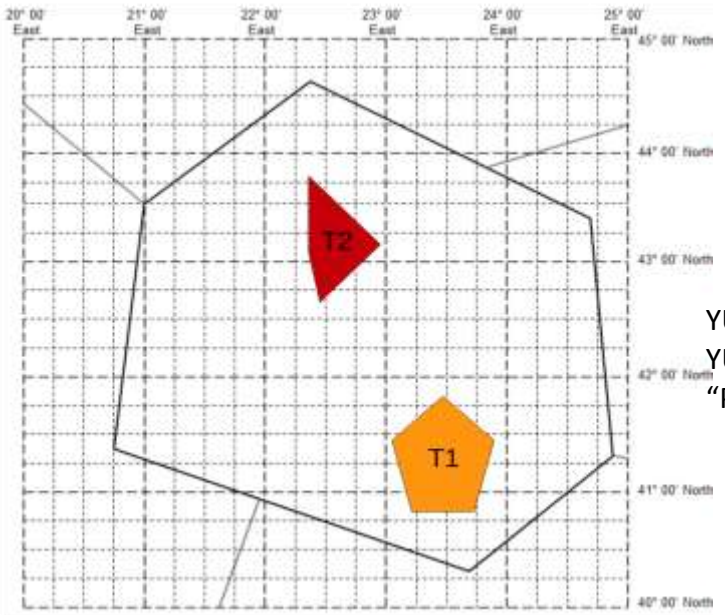
```
a) YUDD SIGMET 1 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD FCST AT 1400Z WI [POLYGON1] FL250/370 NC FCST AT
1800Z WI [POLYGON2]=

b) YUDD SIGMET 1 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD FCST AT 1400Z WI [POLYGON1] FL250/370 MOV NE 10KT
NC=
```

Case a) is more informative than case b).

Case 2) Using FCST AT with the same time as the validity period starting hour

For any SIGMET, the aim is to make explicit the time of validity T1 of the polygon even if it is redundant with the information given in the validity group. Especially when the location at the end of validity is described by a polygon (and not by MOV) the symmetry between the description of the polygons at time T1 and T2 is better.

According to Annex 3 provisions, FCST AT (in *Forecast position (C))* is mandatory for the polygon 2 at T2 (if described) whereas both FCST or FCST AT can be used in *Observed or forecast phenomenon (M*)) for the polygon 1 at T1.



YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD **FCST AT 1200Z** WI "POLYGON1" FL250/370 NC **FCST AT 1800Z WI "**POLYGON2" =

Thus two possibilities are offered to the forecaster to describe the VA cloud movement:

```
a) YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD FCST AT 1200Z WI [POLYGON 1] FL250/370 WKN FCST AT
1800Z WI [POLYGON2]=
b) YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD FCST AT 1200Z WI [POLYGON 1] FL250/370 MOV NW 10KT
WKN=
```

Case a) is more informative than case b).

APPENDIX H

ENHANCED SIGMET GUIDANCE TABLE DEVELOPED FROM ANNEX 3 TABLE A6-1A

Note. —The table below seeks to provide more detailed guidance than that given in Table A6-1A of Annex 3 (19th Edition, July 2016). It does this by removing all references to the AIRMET message. Table A6-1A.The table below simplifies the available options and provides more specific expansion of the symbolic structure of SIGMET messages, with guidance sub-titles where appropriate. It should be noted that Annex 3, Appendix 6, Table A6-1A remains the authoritative reference.

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
1.1	Location indicator of FIR/CTA (M)[1]	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers	nnnn	YUCC[2] YUDD[2]
1.2	Identification (M)	Message identification and sequence number[3]	SIGMET n SIGMET nn SIGMET nnn 1.1.1	SIGMET 1 SIGMET 01 SIGMET A01
1.3	Validity period (M)	Day-time groups indicating the period of validity in UTC	VALID nnnnnn/nnnnnn	VALID 010000/010400 VALID 221215/221600 VALID 101520/101800 VALID 251600/252200 VALID 152000/160000 VALID 192300/200300 VALID 122200/130400 (6 hour validity applicable to TC or VA only)
1.4	Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen	nnnn-	YUDO-[2] YUSO-[2]
1.5	Name of the FIR/UIR/CTA	Location indicator and name of the	nnnn nnnnnnnnnn FIR nnnn nnnnnnnnnn FIR/UIR	YUCC AMSWELL FIR[2]

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
		FIR/UIR/CTA[4] for which the SIGMET is issued	nnnn nnnnnnnnnn UIR nnnn nnnnnnnnnn CTA	YUDD SHANLON FIR/UIR[2] YUDD SHANLON FIR[2] YUDD SHANLON UIR[2] YUCC AMSWELL CTA[2]
2.1	Phenomenon (M)[5]	Description of phenomenon causing the issuance of SIGMET	OBSC[6] TS OBSC[6] TSGR[7] EMBD[8] TS EMBD[8] TSGR[7] FRQ[9] TS FRQ[9] TSGR[7] SQL[10] TS SQL[10] TSGR[7] TC nnnnnnnnnn PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB TC NN[11] PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB SEV TURB[12] SEV ICE[13] SEV ICE (FZRA)[13] SEV MTW[14] HVY DS HVY SS VA ERUPTION PSN Nnn[nn] *or* Snn[nn] Ennn[nn] *or* Wnnn[nn] VA CLD 1.1.2 1.1.3 VA ERUPTION MT nnnnnnnnnn PSN Nnn[nn] *or* Snn[nn] Ennn[nn] *or* Wnnn[nn] VA CLD 1.1.4 1.1.5 VA CLD	OBSC TS OBSC TSGR EMBD TS EMBD TSGR FRQ TS FRQ TSGR SQL TS SQL TSGR TC GLORIA PSN N2215 W07500 CB TC NN PSN S26 E150 CB SEV TURB SEV ICE SEV ICE (FZRA) SEV MTW HVY DS HVY SS VA ERUPTION PSN N27 W017 VA CLD VA ERUPTION PSN S1200 E01730 VA CLD VA ERUPTION MT ASHVAL[2] PSN S15 E073 VA CLD VA ERUPTION MT VALASH[2] PSN N2030 E02015 VA CLD VA CLD RDOACT CLD

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
			RDOACT CLD	
2.2	Observed or forecast phenomenon (M)	Indication whether the information is observed and expected to continue, *or* forecast	OBS OBS AT nnnnZ FCST FCST AT nnnnZ	OBS OBS AT 1210Z FCST FCST AT 1815Z

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
2.3	Location (C)[19]	Location (referring to latitude and longitude (in degrees and minutes))	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI[20, 21] 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]][– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]][– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20]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* 2b) In a sector of the FIR defined as being **between**two lines of latitude, or **between** two lines of longitude. N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550 WI N30 W067 – N32 W070 – N35 W068 – N30 W067 *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). NE OF LINE N2515W08700– N2000 W08330 S OF LINE S14E150– S14 E155 *or* 2b) In a sector of the FIR defined as being **between** two lines of latitude, or **between** two lines of longitude.

			Snn[nn] *or* W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn] or E OF Ennn[nn] or 2c) In a sector of the FIR defined as being **between** two specified lines, or **between** two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20]Nnn[nn]*or* Snn[nn] Wnnn[nn]*or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] AND [N][NE][E][SE][S][SW][W][NW] OF LINENnn[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]] 2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); N OF Nnn[nn] AND W OF Wnnn[nn]*or* N OF Nnn[nn] AND E OF Wnnn[nn]*or* S OF Nnn[nn] AND W OF Wnnn[nn]*or* S OF Nnn[nn] AND E OF Wnnn[nn]*or* N OF Snn[nn] AND W OF Ennn[nn]*or* N OF Snn[nn] AND E OF Ennn[nn]*or* S OF Snn[nn] AND W OF Ennn[nn]*or* S OF Snn[nn] AND E OF Ennn[nn]*or* *or* 2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF Nnn[nn]*or* S OF Nnn[nn]*or* N OF Snn[nn]*or* S OF Snn[nn]*or*	N OF N45 AND S OF N50 W OF E04530 AND E OF E04000 or 2c) In a sector of the FIR defined as being **between** two specified lines, or **between** two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); S OF N3200 AND E OF E02000 S OF S3215 AND W OF E10130 S OF N12 AND W OF E040 N OF N35 AND E OF E078 *or* 2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF S2230 S OF S43 E OF E01700 E OF W005

			W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* 3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX nnKM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] APRX nnNM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 4) At a specific point within the FIR; Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* 5) tropical cyclone; WI nnnKM (or nnnNM) OF TC CENTRE[22] *or* 6) A reference to the whole FIR, FIR/UIR, UIR or CTA ENTIRE FIR ENTIRE FIR/UIR	*or* 3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010 – N60 E015 APRX 50NM WID LINE BTN S1530 W09500 – S1815 W10130 – S2000 W10300 *or* 4) At a specific point within the FIR; N5530 W02230 S12 E177 *or* 5) tropical cyclone; WI 400KM OF TC CENTRE WI 250NM OF TC CENTRE *or* 6) A reference to the whole FIR, FIR/UIR, or CTA ENTIRE FIR[18] ENTIRE FIR/UIR

			ENTIRE UIR ENTIRE CTA	ENTIRE UIR ENTIRE CTA[18]
2.4	Level (C)[19]	Flight level or altitude[23]	1) Generic height/range descriptors to be used when 'Location' descriptors above are used. FLnnn nnnnFT nnnnnFT nnnnM SFC/FLnnn SFC/nnnnM SFC/nnnnFT SFC/nnnnnFT FLnnn/nnn TOP FLnnn ABV FLnnn TOP ABV FLnnn ABV [n]nnnnFT TOP ABV [n]nnnnFT nnnn/nnnnM [n]nnnn/[n]nnnnFT nnnnM/FLnnn [n]nnnnFT/FLnnn *or*[22] TOP BLW FLnnn *or*[22] TOP ABV FLnnn	1) Generic height/range descriptors to be used when 'Location' descriptors above are used. FL180 7000FT 10000FT 600M 1200M SFC/FL070 SFC/9000FT SFC/10000FT SFC/2500M FL050/080 FL310/450 TOP FL390 ABV FL280 TOP ABV FL100 ABV 12000FT TOP ABV 9000FT 3000M 2000/3000M 8000FT 6000/12000FT 11000/14000FT 2000M/FL150 8000FT/FL190 10000FT/FL250 *or*[22] TOP BLW FL450 *or*[22] TOP ABV FL360
2.5	Movement *or* expected movement (C)[19, 24]	Movement *or* expected movement (direction and speed) with reference to one of the sixteen points of compass, *or* stationary	MOV[N][NNE][NE][ENE][E][ESE][SE][SSE][S][SSW][SW][WSW][W][WNW][NW][NNW] nnKMH *or* MOV[N][NNE][NE][ENE][E][ESE][SE][SSE][S][SSW][SW][WSW][W][WNW][NW][NNW] nnKT *or*	MOV E 40KMH MOV E 20KT MOV SE STNR

			STNR	
2.6	Changes in intensity [19]	Expected changes in intensity (C)	INTSF *or* WKN *or* NC	WKN INTSF NC
2.7	Forecast time (C)[24]	Indication of the forecast time of the phenomena	FCST AT nnnnZ	FCST AT 2200Z FCST AT 0000Z
2.7	Forecast position (C)[19, 24, 25]	Forecast position of volcanic ash cloud *or* the centre of the TC *or* other hazardous phenomena[25] at the end of the validity period of the SIGMET message (C)	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI[20, 21] 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]][– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]][– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] 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* 2b) In a sector of the FIR defined as being **between** two lines of latitude, or **between** two lines of longitude. N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF Snn[nn] *or*	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550 WI N30 W067 – N32 W070 – N35 W068 – N30 W067 *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). NE OF LINE N2515W08700– N2000 W08330 S OF LINE S14E150– S14 E155 *or* 2b) In a sector of the FIR defined as being **between** two lines of latitude, or **between** two lines of longitude. N OF N45 AND S OF N50

			W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn] or E OF Ennn[nn] or 2c) In a sector of the FIR defined as being **between** two specified lines, or **between** two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] AND [N][NE][E][SE][S][SW][W][NW] OF LINE 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]] 2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); N OF Nnn[nn] AND W OF Wnnn[nn] *or* N OF Nnn[nn] AND E OF Wnnn[nn] *or* S OF Nnn[nn] AND W OF Wnnn[nn] *or* S OF Nnn[nn] AND E OF Wnnn[nn] *or* N OF Snn[nn] AND W OF Ennn[nn] *or* N OF Snn[nn] AND E OF Ennn[nn] *or* S OF Snn[nn] AND W OF Ennn[nn] *or* S OF Snn[nn] AND E OF Ennn[nn] *or* *or* 2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or*	W OF E04530 AND E OF E04000 or 2c) In a sector of the FIR defined as being **between** two specified lines, or **between** two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 2d) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); S OF N3200 AND E OF E02000 S OF S3215 AND W OF E10130 S OF N12 AND W OF E040 N OF N35 AND E OF E078 *or* 2e) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF S2230 S OF S43 E OF E01700 E OF W005

			E OF Wnnn[nn]*or* W OF Ennn[nn]*or* E OF Ennn[nn] *or* 3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX nnKM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] APRX nnNM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 4) At a specific point within the FIR; Nnn[nn] Wnnn[nn]*or* Nnn[nn] Ennn[nn]*or* Snn[nn] Wnnn[nn]*or* Snn[nn] Ennn[nn] *or* 5) tropical cyclone; TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] OF TC CENTRE *or* 6) A reference to the whole FIR, FIR/UIR, UIR, or CTA ENTIRE FIR ENTIRE FIR/UIR ENTIRE UIR	*or* 3) Defined by a 'corridor' of specified width, centred upon the line described; APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010 – N60 E015 APRX 50NM WID LINE BTN S1530 W09500 – S1815 W10130 – S2000 W10300 *or* 4) At a specific point within the FIR; N5530 W02230 S12 E177 *or* 5) tropical cyclone; TC CENTRE PSN N1230 W04530 *or* 6) A reference to the whole FIR, FIR/UIR, UIR or CTA ENTIRE FIR ENTIRE FIR/UIR ENTIRE UIR ENTIRE CTA[18]

			ENTIRE CTA *or* 7) No volcanic ash expected[26] NO VA EXP	7) No volcanic ash expected NO VA EXP
	Repetition of elements (C)[27]	Repetition of elements included in a SIGMET message for volcanic ash cloud or tropical cyclone	[AND] [27]	AND
	Cancellation of SIGMET (C)[28]	Cancellation of SIGMET referring to its identification	CNL SIGMET n nnnnnn/nnnnnn CNL SIGMET nn nnnnnn/nnnnnn CNL SIGMET nnn nnnnnn/nnnnnn *or* CNL SIGMET n nnnnnn/nnnnnn VA MOV TO nnnn FIR CNL SIGMET nn nnnnnn/nnnnnn VA MOV TO nnnn FIR CNL SIGMET nnn 251030/251430 VA MOV TO YUDO FIR	CNL SIGMET 2 102000/110000 CNL SIGMET 12 101200/101600 CNL SIGMET A12 031600/032000 CNL SIGMET 3 251030/251630 VA MOV TO YUDO FIR CNL SIGMET 06 191200/191800 VA MOV TO YUDO FIR CNL SIGMET B10 030600/031200 VA MOV TO YUDO FIR

Table A-1: Expanded SIGMET template

Footnotes to table: (note, in order to ensure consistency between this document and ICAO Annex 3, Table 6-1A, any footnote in Table 6-1A that refers to AIRMET only is identified as such below.

1. See 4.1. "**Recommendation.—** *In cases where the airspace is divided into a flight information region (FIR) and an upper flight information region (UIR), the SIGMET should be identified by the location indicator of the air traffic services unit serving the FIR. Note.— The SIGMET message applies to the whole airspace within the lateral limits of the FIR, i.e. to the FIR and to the UIR. The particular areas and/or flight levels affected by the meteorological phenomena causing the issuance of the SIGMET are given in the text of the message.*"
2. Fictitious location.
3. In accordance with 1.1.3 "The sequence number referred to in the template in Table A6-1A shall correspond with the number of SIGMET messages issued for the flight information region since 0001 UTC on the day concerned. The meteorological watch offices whose area of responsibility encompasses more than one FIR and/or control area (CTA) shall issue separate SIGMET messages for each FIR and/or CTA within their area of responsibility."
4. AIRMET only – not SIGMET
5. As per 1.1.4 "In accordance with the template in Table A6-1A, only one of the following phenomena shall be included in a SIGMET message, using the abbreviations as indicated below [list of SIGMET phenomena follows in section 1.1.4 – see section]"
6. *Obscured (OBSC) if it is obscured by haze or smoke* in accordance with ICAO Annex 3, 4.2.1 a) and agreed EUR best practices not using "due to darkness".
7. In accordance with 4.2.4 "*Hail (GR) should be used as a further description of the thunderstorm, as necessary*"
8. accordance with 4.2.1 b) "*embedded (EMBD) if it is embedded within cloud layers and cannot be readily recognized*"
9. In accordance with 4.2.2 "**Recommendation.—** An area of thunderstorms should be considered frequent (FRQ) if within that area there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75 per cent of the area affected, or forecast to be affected, by the phenomenon (at a fixed time or during the period of validity)"
10. In accordance with 4.2.3 "**Recommendation.—**Squall line (SQL) should indicate a thunderstorm along a line with little or no space between individual clouds."
11. Used for unnamed tropical cyclones.
12. In accordance with 4.2.5 and 4.2.6 "**Recommendation.—**Severe turbulence (TURB) should refer only to: low-level turbulence associated with strong surface winds; rotor streaming; or turbulence whether in cloud or not in cloud (CAT). Turbulence should not be used in connection with convective clouds." and "Turbulence shall be considered: a) severe whenever the peak value of the cube root of EDR exceeds 0.7"
13. In accordance with 4.2.7 "**Recommendation.—**Severe icing (ICE) should refer to icing in other than convective clouds. Freezing rain (FZRA) should refer to severe icing conditions caused by freezing rain".
14. In accordance with 4.2.8 "**Recommendation.—** A mountain wave (MTW) should be considered: a) severe whenever an accompanying downdraft of 3.0 m/s (600 ft/min) or more and/or severe turbulence is observed or forecast; and *b) moderate whenever an accompanying downdraft of 1.75–3.0 m/s (350–600 ft/min) and/or moderate turbulence is observed or forecast.*"
15. AIRMET only – not SIGMET

16. AIRMET only – not SIGMET
17. AIRMET only – not SIGMET
18. AIRMET only – not SIGMET
19. In the case of volcanic ash cloud or tropical cyclone covering more than one area within the FIR, these elements can be repeated, as necessary.
20. A straight line is to be used between two points drawn on a map in the Mercator projection or between two points which crosses lines of longitude at a constant angle.
21. The number of coordinates should be kept to a minimum and should not normally exceed seven.
22. Only for SIGMET messages for tropical cyclones.
23. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
24. The elements “forecast time” and “forecast position” are not to be used in conjunction with the element “movement or expected movement”.
25. The levels of the phenomena remain fixed throughout the forecast period.
26. Only for SIGMET messages for volcanic ash.
27. To be used for two volcanic ash clouds or two centres of tropical cyclones simultaneously affecting the FIR concerned.
28. End of the message (as the SIGMET message is being cancelled).

Additional notes (not specifically identified in footnotes to Table A6-1A):

In accordance with 4.2.9 “Sandstorm/duststorm should be considered: a) heavy whenever the visibility is below 200 m and the sky is obscured; and b) moderate whenever the visibility is: 1) below 200 m and the sky is not obscured; or 2) between 200 m and 600 m.” (no footnote in Annex 3, but this is applicable reference)

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Appendix I - Guidance on Special air-reports

Example - Special air-report on volcanic ash

- **pilot to ACC Petropovlovsk-Kamchatsky**

  - A pilot provides a special air-report on volcanic ash via voice communications to ACC. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example is provided.

    ‘**AIREP SPECIAL UNITED AIRLINES TREE TOO TOO POSITION FIFE FIFE ZERO TREE NORTH WUN SEVen ZERO TOO ZERO EAST FLIGHT LEVEL TREE ZERO ZERO CLIMBING TO FLIGHT LEVEL TREE FIFE ZERO VOLCANIC ASH CLOUD EXERCISE VOLKAM15 EXERCISE EXERCISE EXERCISE**‘

- **ACC Petropovlovsk-Kamchatsky (PKK) to MWO Yelizovo**

  There are different arrangements between ACC and MWO (e.g. information provided by fax or phone vs. AFTN). The following is an example of providing a special air-report from the ACC to the MWO via AFTN.

  - The format used for forwarding of meteorological information received by voice communications to the associated meteorological watch office (MWO) is provided in subtitle 3 of Appendix 1 of PANS-ATM. An example is provided based on the information given by the pilot or dispatch.

  - **ARS UAL322 5503N17020E 0105 F300 ASC F350 VA CLD=**

- **MWO Yelizovo to VAAC Tokyo, Regional OPMET Centre-ROC Vienna, SADIS, WIFS**

  - The format used for forwarding of a special air-report from the MWO to VAAC, ROC, SADIS and WIFS is in accordance to Annex 3, Appendix 6, Table A6-1B (**uplink**). An example is provided based on the informaton given by the ACC.

    ARS UA322 VA CLD OBS AT 0105Z N5503E17020 FL300/350=

  - The MWO should send this information using the World Meteorological Organization Abbreviated Header Line (WMO AHL) of **UARA71 RUPK** to:

    - Appropriate ROC – in this case, ROC Vienna at AFTN address **LOWMMMXX** which will then route to SADIS (EGZZWPXX) and WIFS (KWBCYMYX) Appropriate VAAC – in this case, VAAC Tokyo (fax: +81 (3) 3212 6446; email vaac@eqvol2.kishou.go.jp; AFTN address **RJTDYMYX**), according to the regional OPMET exchange schema

When absence of visible ash is observed by pilots, follow procedures in section 4.7 of the Handbook on the International Airways Volcano Watch (IAVW) that is reproduced here within.

In the event of an eruption, operators should request their pilots to report, when appropriate, any observation related to a volcanic ash cloud including the absence of visible ash and all other relevant information such as observational conditions. The operator should then forward this information to the associated VAAC in a timely manner.

Note. – Visible ash is defined in the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691).

Example - Special air-report for severe turbulence

- **pilot to ACC Paris**

  - A pilot provides a special air-report on severe turbulence via voice communications to ACC. Referencing PANS-ATM Appendix 1, Part 1 – Reporting instructions sections 1-4 and 9, the following example is provided.

    ‘**AIREP SPECIAL AIR NEW ZEALAND WUN ZERO WUN POSITION FIFE ZERO ZERO FIFE NORTH ZERO ZERO TOO ZERO WUN WEST WUN FIFE TREE SIX FLIGHT LEVEL TREE WUN ZERO CLIMBING TO FLIGHT LEVEL TREE FIFE ZERO SEVERE TURBULENCE**‘

- **ACC Pairs (LFFF) to MWO Toulouse (Centre Meteo)**

  There are different arrangements between ACC and MWO (e.g. information provided by fax or phone vs. AFTN). The following is an example of providing a special air-report from the ACC to the MWO via AFTN.

  - The format used for forwarding of meteorological information received by voice communications to the associated meteorological watch office (MWO) is provided in subtitle 3 of Appendix 1 of PANS-ATM. An example is provided based on the information given by the pilot or dispatch.

  - **ARS ANL101 5005N00201W 1536 F310 ASC F350 SEV TURB=**

- **MWO Toulouse to Regional OPMET Centre-ROC Toulouse, SADIS, WIFS**

  - The format used for forwarding of a special air-report from the MWO to ROC, SADIS and WIFS is in accordance to Annex 3, Appendix 6, Table A6-1B (**uplink**). An example is provided based on the informaton given by the ACC.

    ARS NL101 SEV TURB OBS AT 1536Z N5005W00201 FL310=

  - The MWO should send this information using the World Meteorological Organization Abbreviated Header Line (WMO AHL) of **UAFR61 LFPW** to:

    - Appropriate ROC – in this case, ROC Toulouse at AFTN address **LFPWYMEU** which will then route to SADIS (EGZZWPXX) and WIFS (KWBCYMYX) according to the regional OPMET exchange schema

Appendix J – Agreed EUR Best Practice with regard to SIGMET

The guidance below refers to agreed best practice with regard to SIGMET within the EUR Region. The guidance is not intended to conflict with regulations or guidance in ICAO documentation, such as ICAO Annex 3, and is provided to complement such regulations.

OBSC: Within EUR, it is considered that the following guidance be followed. "*when interpreting the definition of OBSC in ICAO Annex 3, it is considered that obscuration through two thirds or more of expected vertical depth is an appropriate threshold on which to base a decision to include in SIGMET.*"

EMBD: Within EUR, it is considered that the following guidance be followed. "*when interpreting the definition of EMBD in ICAO Annex 3, it is considered that phenomenon embedded through two thirds or more of expected vertical depth and when associated with frontal structure or organised mesoscale convective systems is an appropriate threshold on which to base a decision to include in SIGMET*".

FRQ: Within EUR, it is considered that the following guidance be followed. "*when interpreting the definition of FRQ in ICAO Annex 3, it is considered that a distribution assessed over a domain of approximately 100 KM by 100 KM is an appropriate threshold on which to base a decision to include in SIGMET. In addition, the assessment should be considered ACROSS FIR boundaries, and SIGMETs coordinated accordingly between MWOs*". It is also noted that that the abbreviation 'FRQ' (for 'frequent') is a temporal descriptor, yet the ICAO definition is spatial. It is proposed that for simplification the spatial definition is retained when assessing need to include reference to FRQ in SIGMET.

It is recommended to use FRQ versus EMBD when issuing TS SIGMET when both conditions occur.

SQL: Within EUR, it is considered that the following guidance be followed. "*when interpreting the definition of SQL in ICAO Annex 3the thunderstorms along a line without gaps of at least 100 KM in length is an appropriate threshold on which to base a decision to include in SIGMET. In addition, the assessment should be considered ACROSS FIR boundaries, and SIGMETs coordinated accordingly between MWOs"*

TS: Within EUR, it is considered that the following guidance be followed. *"when thunderstorms are observed in one part of a FIR occupying a large territory and forecast in another part of the same FIR, separate SIGMET should be issued within the FIR".*

FZRA: In presence of very low inversions, very shallow freezing precipitation layers may develop at or very near the surface. Even if the 'intensity of the precipitation' is slight', the 'intensity of the airframe icing under such circumstances' is often considered to be severe. Furthermore, pilots have reported that freezing precipitation may have strong impacts on take off/landing performances.

As a consequence, within EUR, it is considered that the following guidance be followed:

"Given the impact of freezing precipitation on take off/landing performances:

- *on receipt of observation of freezing rain at the surface or aloft, SIGMET for severe icing due to freezing rain - SEV ICE (FZRA) - should always be issued, regardless of the depth of the freezing precipitation layer or the surface proximity.*
- *on receipt of observation of freezing drizzle, SIGMET for severe icing could be issued, regardless of the depth of the freezing precipitation layer or the surface proximity. The mention (FZRA) could be added, depending on the estimated impact of the phenomenon."*

Here, it must be reminded that, due to the risk of false alarm, automated observations of FZRA from ground stations must be cautiously considered.

In this context it is also worth mentioning that the observation of FZRA by ground stations must not be mixed up with the observation of SEV ICE (FZRA) by a pilot, with the former referring to ground observations of rain during temperatures below zero while the latter describes significant airframe ice accretion observed by a pilot. Thus if evidence of a pilot observation is not given it is recommended to formulate the SIGMET as SEV ICE (FZRA) FCST. However, if a pilot report confirms the occurrence of severe icing due to freezing rain, a SIGMET about SEV ICE (FZRA) OBS is more appropriate.

Therefore, it is considered that the following guidance be followed:

-SEV ICE (FZRA) FCST when FZRA (rain with negative temperatures) is observed by ground stations;
-SEV ICE (FZRA) OBS when a pilot report confirms the occurrence of severe icing (significant airframe accretion) due to freezing rain.

Dealing with reports of observed phenomena when SIGMET is already valid. On receipt of a Special air-report a MWO is expected to consider if the report warrants re-issue as a Special air-report UPLINK (if transient) or a SIGMET (if persistent). This does not appear to capture the scenario if a SIGMET is already valid. In such instances it is proposed that there is no need to re-issue as a Special air-report UPLINK nor to re-issue the SIGMET, since a SIGMET already exists.

Change in intensity: It is only permitted to make a single reference to change in intensity, and of course the change in intensity may be different within different areas of the phenomena. It is proposed that to err on the side of safety, INTSF (intensifying) would take priority if any sub-area of the region intensifies; NC (no change) would take priority if applicable to a sub-area of the region and if INTSF does not apply; and WKN (weakening) would only be used if applicable to the entire area.

Appendix K – Template for Letter of Agreement

Directives for the cross-FIR SIGMET coordination between MWOs of adjacent States

General Guidelines

The present Template for Letter of Agreement (hereinafter referred to as **the LoA template**) may be used by the MET Service Providers (METSPs) in drafting their operational Letters of Agreement (LoA) and facilitate the implementation of SIGMET coordination procedure between MWOs of adjacent States. However, it is unable to provide for all aspects of a given situation between two MWOs. The structure and the content of the LoA template should be considered as guidelines and as such, may have to be adapted as required. The detailed cross-FIR SIGMET co-ordination procedure is recommended to be addressed in Annex to a LoA. Normally, a LoA should be signed by the representatives of the METSPs.

Structure and content of the LoA template	Comments/Notes
1. GENERAL	
1.1 Objective	
The objective of this Letter of Agreement between [METSP[1]] and [METSP[2]] is to establish the directives for the necessary coordination between [MWO[1]] and [MWO[2]] to provide the aviation community with consistent SIGMET information when cross-border weather phenomenon is observed or forecast.	
1.2 Operational Status	** This is especially important to be included in LoA if a relocation of MWO or assignment, to third MWO, of the responsibility for providing meteorological watch is planned to be implemented as contingency measures.*
Both METSPs as early as practicable should keep each other informed of any changes in the MWOs' operational contact details which may affect the procedures specified in this Letter of Agreement.*	
Also, the following may be considered for inclusion in the LoA:	
Both MWOs should keep each other informed of any change in the operational status of the resources, including technical facilities, which may affect the procedures specified in this Letter of Agreement.	
2. AREAS of RESPONSIBILITY	*Reference should be made to the appropriate State AIPs.*
The lateral and vertical limits of the Areas of Responsibility (FIR/UIR) of the [MWO[1]] and [MWO[2]] are provided in Appendix.	
3. PROCEDURES	
3.1 The procedures to be applied by [MWO[1]] and [MWO[2]]are detailed in the Annexes to this Letter of Agreement:	
Annex 1: SIGMET Coordination Procedure	
Annex 2: Definitions and Abbreviations	
3.2 These procedures shall be promulgated to the operational staff of the MWOs concerned.	
4. REVISIONS and DEVIATIONS	
4.1 Revision of the Letter of Agreement	
The revision of this Letter of Agreement, excluding Annexes and Appendix, requires the mutual written consent of the signatories.	
4.2 Revision of the Annexes to the Letter of Agreement	
The revision of Annexes to this Letter of Agreement requires the mutual written consent of the representatives of the respective MWOs designated by the respective signatories, normally the chiefs of the MWOs.	
4.3 Temporary Deviations	** - figure to be agreed upon locally*
When necessary, the respective chiefs of the MWOs may introduce by mutual agreement and for a specified time period temporary	

modifications to the procedures laid down in the Annexes to this Letter of Agreement. These temporary changes are not intended to last more than.....*days.

4.4 Incidental Deviations

Instances may arise where incidental deviations from the procedures specified in the Annexes to this Letter of Agreement may become necessary. Under these circumstances the operational meteorologists are expected to exercise their best judgement to ensure the safety of air traffic.

5. CANCELLATION

5.1 Cancellation of this Letter of Agreement by mutual agreement of the respective approving authorities of the METSPs may take place at any time.

5.2 Cancellation of this Letter of Agreement by either approving authority of the METSP is possible at any time, provided that the cancelling party declares its intention to cancel the Letter of Agreement with a notice period of …*days before the date the cancellation is to take effect.

** - time period to be agreed upon locally*

6. COORDINATION MEETINGS

Regular and/or ad-hoc coordination meetings (e-mail/phone communication or teleconferences as alternative) between the chiefs of the MWOs and MWO representatives to discuss implementation of SIGMET coordination process or any planned changes will be convened as appropriate and at least every .....* months.

** - time period to be agreed upon locally*

7. VALIDITY

This Letter of Agreement becomes effective [*date*]. **or**

This Letter of Agreement becomes effective [*date*], and supersedes the Letter of Agreement between [METSP[1]] and [METSP[2]] dated [*date*].

8. APPENDIX. AREAS of RESPONSIBILITY

Appendix with map of the appropriate FIRs/[UIRs]

9. ANNEX 1. SIGMET COORDINATION PROCEDURE

9.1 Purpose of the procedure.

9.2 Initiation of the process (criteria for coordination activity, including issuance of special air report (uplink) as the equivalent of SIGMET[1, 2,3]).

9.3 Means to be used for operational communication, including, if necessary, for exchanging/supplying information (for example, forwarding of special air-reports additionally to their dissemination via ROC).

9.4 Contact details (phone, fax etc.).

9.5 Language.

9.6 Responsibilities[4].

9.7 Maintaining of logs when agreement is not reached.

9.8 Special arrangements for contingency situation (notification about change of MWO operational status and new contact details[5]), as well as any other arrangements as reasonably

1. *When at least one MWO applies the procedure for issuing a special air report (uplink) as the equivalent of SIGMET in case of the phenomenon reported is "of a transient nature".*

2.*For cases when the phenomenon reported is expected to persist but moves away from the FIR in which it is observed to the territory of adjacent FIR (the phenomenon reported is "of a transient nature" with regard to own FIR only).*

3.*At least information about applicability/non-applicability of the procedure by each MWO involved should be clearly indicated and promulgated to the meteorologists.*

4.*Each MWO retains the right*

required.		*to issue SIGMET at its final discretion within its FIR when the MWOs involved cannot agree on the content of SIGMET information.* ***5.*** *See comments above for paragraph 1.2"Operational Status".*

Appendix L – SIGMET coordination process template

SIGMET Coordination between State_X (Name_of_State_X MWO) and State_Y (Name_of_State_Y MWO).

Explanatory note:
It is intended that each State would have what is effectively a reciprocal version of the template below. Of course, if necessary where one or other or both States have multiple mutually adjacent FIRs, then additional FIRs, and perhaps even MWO contact details will need to be included. The template is a framework. It is intended to be adapted as necessary to meet the aims of each State, yet also providing a common approach to establishing SIGMET coordination. It is also intended that this Explanatory note be deleted from the final version agreed between States.

Language in which SIGMET Coordination will be undertaken: Xxxx

Customer location / forecast area:

Any SIGMET which affects the State_X_FIR_Name FIR [CCCC_of_FIR] which may also affect the State_Y_FIR_Name FIR [CCCC_of_FIR] and vice versa.

See enclosed detailed FIR maps.

Purpose of Service:
To allow for consistency of SIGMETs between the State_X_Met_Provider and State_Y_Met_Provider. This is in terms of the content, horizontal position, vertical extent, severity, timing and movements of SIGMET phenomena between the State_X and State_Y FIR regions with mutual boundaries.

Description of requirement:

1. Telephone/email consultation between the State_X_Met_Provider meteorologist responsible for State_X Meteorological Watch Office (MWO) and State_Y_Met_Provider meteorologist responsible for the State_Y MWO to agree on proposed content, horizontal location, vertical depth, boundaries and speeds of movement of any SIGMETs affecting, or expected to affect, both States' FIR regions of responsibility.
2. The caller should clearly identify who is calling, what function and from what office. It should also be clearly stated that the purpose of the call is SIGMET coordination.

Production methodology:

- Whenever practicable, approximately 15 minutes before the issue of a SIGMET for the State_X FIR, the State_X MWO meteorologist is to consider if the phenomena may

also affect the State_Y FIR. If so, the State_X MWO meteorologist is to contact the State Y meteorologist (Tel +yyyyyyyyy) to discuss the content of the SIGMET and the proposed location on the boundary with State_Y FIR(s).

- State Y meteorologist will follow the same procedure and will contact State_X MWO (Tel +xxxxxxxxx) to discuss any SIGMETs they are proposing to issue for State_Y FIR(s) which they believe may also affect the State_X FIR.
- Refer to the SIGMET FIR maps to discuss boundaries of proposed SIGMETs, in order to agree consistent forecasts in terms of where the SIGMET crosses the FIR boundaries.
- Current issued SIGMETs can be visualised graphically by the State_X_Met_Provider on System to aid discussion. Current issued SIGMETs can be visualised graphically by the State_Y_Met_Provider on System to aid discussion.
- In the event of any disagreement, each MWO will retain the right to the the final details relating to the phenomenon over their own area(s) of responsibility.
- To facilitate understanding of reasons for differences, and to permit further coordination, under circumstances of differences of opinion a brief summary should be provided to the meteorologists' manager.
- This procedure to be made effective dd/mm/yy

Amendment criteria:

SIGMETS are not amended. If they are incorrect they are cancelled and the correct version transmitted as a new SIGMET. If the phenomenon changes intensity, location etc, enough to make the existing SIGMET misleading, it should be cancelled and a new one issued. The cancelled SIGMET should be numbered according to the normal sequential daily numbering system.

The State_Y meteorologist should be consulted as per the process above in relation to any cancellation and re-issuance of SIGMET that may affect State_Y's area of responsibility.

Map of State_X and State_Y FIR(s):

Include appropriate map.

Larger Scale Map Map of State_X and State_Y FIR(s):

Include appropriate map.

Appendix M – Example proforma for logging of SIGMET coordination – bilateral phone call statistics

The proforma below may be used by MWOs to log the statistics relating to SIGMET coordination. It may, of course, be adapted as necessary.

MWO:			Date/Time (UTC)	
SIGMET Phenomenon :				
Exchange with MWO(s) (Name, FIR):			Call made before the issuance of the SIGMET?:☐YES☐NO	
Who called whom?				
Result of the Discussion:	Agreement on SIGMET issuance	Agreement on duration	Agreement on horizontal extent	Agreement on vertical extent
	☐ yes☐ no	☐ yes☐ no	☐ yes☐ no	☐ yes☐ no
Additional remarks:				
Signature: (Forecaster on duty)				

MWO:			Date/Time (UTC)	
SIGMET Phenomenon :				
Exchange with MWO(s) (Name, FIR):			Call made before the issuance of the SIGMET?: ☐YES☐NO	
Who called whom?				
Result of the Discussion:	Agreement on SIGMET issuance	Agreement on duration	Agreement on horizontal extent	Agreement on vertical extent
	☐ yes☐ no	☐ yes☐ no	☐ yes☐ no	☐ yes☐ no
Additional remarks:				
Signature: (Forecaster on duty)				