ICAO EUR DOC 014

INTERNATIONAL CIVIL AVIATION ORGANIZATION

EUR SIGMET AND AIRMET GUIDE

THIRD EDITION

2020

PREPARED BY THE EUROPEAN AND NORTH ATLANTIC OFFICE OF ICAO

RECORD OF AMENDMENTS AND CORRIGENDA

Amendments			
No.	Date of issue	Date entered	Entered by
1	~~24~~ ~~September~~ ~~2021~~24/9/21	24/9/21~~24~~ ~~September~~ ~~2021~~ [BK1] [ME2]	EASPG METG/31 ~~ad hoc group~~

Corrigenda			
No.	Date of issue	Date entered	Entered by

TABLE OF CONTENTS

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 that 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 eANP (ICAO Doc 7754).

~~1.1.~~1.2. Within this document, the terms SIGMET and AIRMET stand for the message and the SIGMET and AIRMET information[ME3]~~including the contained information~~.

~~1.2.~~1.3. ~~In respect of~~ SIGMET ~~messages~~[BK4][WC5][OF(6)][ME7]~~, t~~This document includes guidance for SIGMET concerning significant en-route weather and other phenomena~~ and volcanic ash. SIGMET messages~~. ~~Provisional guidance for those EUR States with FIRs that may be affected by tropical cyclones is also included, pending official requirements within the eANP~~. Space Weather is not within the scope of this document, as there is no requirement for issuing related SIGMETs.

~~1.3.~~1.4. ICAO provisions concerning the issuance and dissemination of SIGMET ~~information~~ are primarily contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapter 3, paragraph 3.4, Chapter 7, paragraph 7.1, 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, Chapter 6, 6.13.2.
- 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.

[ME8]

~~1.4.~~1.5. 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~~ were not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.

~~1.5.~~1.6. ICAO provisions concerning the issuance and dissemination of AIRMET ~~information~~ are primarily contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapter 3, paragraph 3.4, Chapter 6, paragraph 6.5, Chapter 7, paragraph 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.~~1.7. 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, the pilots and their respective responsibilities.

~~1.7.~~1.8. This document is prepared by the ICAO EUR/NAT Regional Office, with the assistance of the EASPG Meteorology Group (METG), 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~~ is ~~be~~ reviewed and regularly updated ~~regularly~~ in order to be kept in line with the ICAO SARPs and regional procedures.

~~1.8.~~1.9. This document is furthermore aimed to be in alignment with the most recent Amendment to ICAO Annex 3 and is designed as guideline. [BK9][MSD10][OF(11]Additional requirements resulting from national and European legislation remain unaffected by this document.

PART 2. RESPONSIBILITIES AND COORDINATION

2.

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, D-VOLMET and other suitable means of data transmission.[BK12][ME13]

~~2.1.1.~~ *Note: SIGMET, AIRMET and special air-reports priority indicator is FF for flight safety messages (Annex 10, Volume II, 4.4.1.1.3)*

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, volcanic eruption, volcanic ash cloud or aircraft encounter with volcanic ash received by MWOs should be transmitted to their associated VAAC and WAFCs using the address specified in ICAO Doc 9766.

2.1.3. 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 D**. The importance of these reports was described at METG/29 (paragraph 3.3.67) as follows: *Special air-reports have value for the following reasons: airlines use these reports in their Safety Risk Assessment approach as well as for choosing efficient routes; appropriate special air-reports relevant to the whole route are required to be provided to operators and flight crew; confirmation of other similar reports and/or SIGMET; and post-analysis of hazardous weather products.* For these reasons many MWOs in the EUR Region disseminate special air-reports, even ~~though it is not an explicit requirement in Annex 3 to do so~~ even if the reported phenomenon has triggered the issuance of a SIGMET.[BK14][MSD15][ME16][OF(17][AP18]

2.1.4. 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.

2.1.5. 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.

2.1.6. SIGMET and AIRMET ~~information is~~ are also used for 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 (via SADIS ~~-~~and WIFS FTP, noting WIFS does not distribute AIRMET and special air-reports).

2.2. Meteorological Watch Office – responsibilities and procedures related to SIGMET and AIRMET

2.2.1. SIGMET and AIRMET ~~information is~~ are 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 ~~A~~area ~~O~~of r~~R~~esponsibility [BK19][ME20](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. In case of interruption to the operation of a MWO – for example due to an IT/communication failure or other such short-term (temporary) outage – its functions may be carried out by another MWO or other meteorological centre as designated by the meteorological authority of the State concerned. The activation/deactivation of such contingency arrangements may be notified to users via NOTAM.

2.2.5. In the case of a more permanent interruption to the operation of an MWO, the meteorological authority of the State concerned may establish a longer-term arrangement (including a bilateral arrangement with another State) to be recorded in the ICAO Regional Air Navigation Plan (ANP) and State Aeronautical Information Publication (AIP). In addition, a Letter of Agreement should be negotiated by the respective MET Authorities and if necessary, assisted by the relevant ICAO Regional Office.

2.2.6. When an MWO serves as a backup to another MWO to issue SIGMET, the SIGMET bulletin headers should be provided to the Regional OPMET Centres in the EUR Region if they are different in order to update their routing databases. Note that there are cases where the backup MWO does not change the bulletin headers in which case no notification is necessary.

2.2.7. 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.

2.2.8. 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). 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.

2.2.9. 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.

2.2.10. On receipt of a special air-report from the associated Area Control Centre (ACC) or Flight Information Centre (FIC), the MWO:

a) should issue the corresponding SIGMET and AIRMET ~~information~~; or,

b) send the special air-report for onward transmission in case the issuance of a SIGMET ~~information~~ is not warranted (e.g.~~,~~ the phenomenon reported is considered to be of transient nature). [WC21][AP22]

2.2.11. 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 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 and special air-reports [BK23][OF(24][ME25][BK26][MSD27][ME28]are sent to the designated OPMET data banks in other ICAO Regions~~,~~).

~~*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)*~~

2.2.12. 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.

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. Air traffic controllers should ascertain whether any of the currently valid SIGMETs or AIRMETs 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.

2.3.4. 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. Such bilateral or multilateral arrangements between Contracting States, including for cooperation and delegation, are enabled by Annex 3 provisions and supported by guidance contained in the *Manual of Aeronautical Meteorological Practice*, Doc 8896.

2.5.2. Such coordination should results in consistent forecasts of hazardous phenomenon and ensures that decisions taken by all stakeholders are basededing their decisions on consistent and [BK29][ME30]coherent meteorological information.

2.5.3. From experience shared by those MWOs who already undertake such coordination, the following advice toforto the establishment of coordination activities[BK31][ME32] 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 E**.

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

3) Meteorologists that will have to doundertaking the coordination who will be involved in the process should be involved already early in the process of establishing the coordination activity.

4) The language for coordination activities must be agreed.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 as it considerseds[MSD33][ME34] 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 G provides an example form for the monitoring of SIGMET coordination between MWOs.

8) Seek feedback from the meteorologists concerned.

9) Arrange an appropriate time interval [BK35][ME36][AP37]to for a review of the process between coordinating MWOs on a regular base.

10) Introduce coordination activities in a gradual process. —iIt may not be practical to implement coordination activities with all adjacent States at the same time, but once coordination activities beginbegin, 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 MWO meteorologists. [BK38][ME39][OF(40][AP41]

2.5.5.2.5.4. Time should be allocated in the normal regular SIGMET production workflow for coordination activities to take place should they be required, and to be carried out with a sufficient lead time to ensure the timely production of the SIGMET. –For observed SIGMET phenomena, coordination activities may be postponed in order to provide a timely warning for airspace users.

2.5.6.2.5.5. The coordination discussion shall comprise

- Whether or not a SIGMET should be issued
- The type of SIGMET phenomenon
- The horizontal and vertical extent
- The period of validity
- The movement, intensity development and forecast position

2.5.7.2.5.6. Coordination, mainly using phone calls or other suitable means of communication, should be instigated by a MWO when:

- A SIGMET phenomenon is expected to occur near to, or cross an airspace border
- A SIGMET phenomenon is moving towards an airspace border, and is expected to cross the border during the validity periodperiod of validity of the SIGMET
- A coordinated SIGMET needs to be extended or cancelled

2.5.8.2.5.7. The goal of coordination is a consistent SIGMET production [BK42][OF(43]for airspace users, comprising harmonized content and availability of SIGMET independent of borders. However, although using common best practices and criteria, the result of coordination may also be regarded as successful, if it is agreed to not issue additional SIGMETs or if attributes of SIGMET deviate due to meteorological reasons.

2.6. Coordination between MWOs and the VAACs

2.6.1. Amongst the phenomena for which SIGMETs are information is required, the avoidance of volcanic ash clouds isare 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 provide VA advisories to the users and this information should be used by 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).[BK44]

PART 3. RULES FOR PREPARATION OF SIGMET ~~INFORMATION~~[OF(45]

3.

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 (and AIRMET) in Traditional Alphanumeric Code (TAC) format are given in **Appendix A**. In addition to the issuance of SIGMET ~~information~~ in Traditional Alphanumeric Code (TAC) format, MWOs are required to~~should~~ issue SIGMET information in the ICAO Meteorological Information Exchange Model (IWXXM) format. *For more information~~:~~, please refer to EUR Doc 018, EUR Doc 020 and WMO ~~-~~No. 306 Volume I.3.*[WC46]

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~~ has~~ve~~ to be strictly[BK47][MSD48][ME49][AP50]~~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 via~~by~~ an Air Traffic Control (ATC) unit or via~~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 maintains watch over the evolution of the phenomenon for which the SIGMET has been issued and issues 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~~AOR~~[MSD51][ME52]. In addition, an 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 specified in Annex 3; b) ~~is~~ not supported by ICAO Meteorological Information Exchange Model (IWXXM); and c) ~~is~~ not clear to ~~the~~ users what element was~~is~~ corrected. The SIGMET is understood to ~~cancel itself~~ automatically expire at the end of its ~~validity period~~period of validity. If the phenomenon persists, a new SIGMET ~~message~~ for a further period of validity ~~has~~ is to be issued. See also 3.4.4.3 and 3.4.4.4.

3.1.6. Some SIGMETs 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 for MWOs, taking the aircraft type into account, to treat such "moderate to severe" observations as 'severe' in the context of using the report to prompt the issuance of a SIGMET.

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 the three types of SIGMET~~,~~ as follows:

- **WS** SIGMETs: these are for en-route weather phenomena other than volcanic ash or tropical cyclones (this ~~includes:~~includes TS, TURB, ICE, MTW, DS, SS, and RDOACT CLD);
- **WV** SIGMETs: these are for volcanic ash;

- **WC** SIGMETs: these are for tropical cyclones. ~~Seven EUR members (France, Ireland, Morocco, Portugal, Russian Federation, Spain and United Kingdom) will have responsibility for issuing TC SIGMET for EUR/NAT FIRs after pending approval into the eANP. As such, provisional guidance is included for TC SIGMET in this guide.~~[WC53]

~~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 s~~S~~chema[WC54][ME55].

3.4. Format of SIGMET

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

Note 2: The rules below apply for SIGMET in TAC format, as well as for SIGMET 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 structured as follows~~constructed in the following way~~:

T_1T_2	Data type designator	~~**For SIGMET in TAC format:**~~ ~~**WC (for tropical cyclones), WV (for volcanic ash), and WS (for other phenomena)**~~ ~~**For SIGMET in IWXXM format:**~~ ~~**LY (for tropical cyclones), LV (for volcanic ash), and LS (for other phenomena)**~~~~[BK56][ME57][AP58]~~ **WC** (SIGMET for tropical cyclones in TAC format) **WV** (SIGMET for volcanic ash in TAC format) **WS** (SIGMET for other phenomena in TAC format) **LY** (SIGMET for tropical cyclones in IWXXM format) **LV** (SIGMET for volcanic ash in IWXXM format)

		LS (SIGMET for other phenomena in IWXXM format)
A_1A_2	Country or territory designator	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/AMHS communication [BK59][ME60]~~)~~ 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) [1]. 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

"WSDL32 EDZF" and "WVDL32 EDZF" for EDWW BREMEN FIR

"WSDL33 EDZF" and "WVDL33 EDZF" for EDMM MUENCHEN[ME61][BK62][ME63] FIR

"WSDL34 EDZF" and "WVDL34 EDZF" for EDUU RHEIN UIR

"WSDL35 EDZF" and "WVDL35 EDZF" for EDVV HANNOVER UIR

Examples:

WSDL32 EDZF 121200

WVRH31 LDZA 010230

WSNO31 ENMI 100600

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)

[1] Note that the list of EUR SIGMET (WS/LS, WV/LV) headers is provided at the following website: http://www.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> EUR Documents ---> MET Guidance ---> Headers – EUR SIGMET and AIRMET).

VALID	Period of validity indicator
YYGGgg/YYGGgg	~~Validity period~~Period of validity 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 shall~~ould~~[BK64][ME65][AP66] 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 I03 VALID 121100/121500 EDZF-
- UMMV SIGMET 3 VALID 271030/271430 UMMS-
-
- Note 1: ~~-~~No other combinations should be used (such as~~e.g. neither, like~~ “CHARLIE 05” ~~n~~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.
- Note 3: Generally, the sequence number is the sequence number for all SIGMET ~~message~~ types (WS, WV and WC) for one flight information region. Within States for which Regulation (EU) 2017/373 and its amendments are~~is~~ applicable it is only ~~-~~permitted to use a phenomenon-specific SIGMET sequence numbering which consists of one letter and two numbers (e.g. A01, A02). Refer to AMC1.MET.TR.250(c) SIGMET.
-

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

- the period of validity of WS SIGMET should not exceed 4 hours;
- the period of validity of WC or WV SIGMET should ~~be up to~~not exceed [OF(67)][ME68]6 hours;
- in case of a SIGMET for an observed phenomenon the issue~~filing~~ time (date/time group in the WMO heading) should be the same or close to the time in the date/time group indicating the start of the SIGMET ~~validity period~~period of validity;
- when the SIGMET is issued for an expected phenomenon:
  - the beginning of ~~validity period~~the period of validity 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~~the period of validity (i.e.~~,~~ expected time of occurrence of the phenomenon). If the forecaster has unambiguous information for the occurrence of a phenomenon, it is recommended to aim for a lead time of at least 30 minutes before the start of the ~~validity period~~period of validity; and,
- for WV and WC [2] SIGMETs the lead time may be up to 12 hours.

[BK69]

3.4.2.4. In addition, the minimum horizontal extent and duration of the hazardous ~~area~~ phenomenon for reporting TURB, ICE, MTW, TS and TSGR in SIGMET should have, respectively:

- ~~———~~have a longest diagonal or side of the polygon representative of the whole hazardous area (independent of the FIR boundaries) of 100 km
- ~~———~~have a minimum duration of 30 minutes.

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

Examples:

1. First line of TAC SIGMET:

WSUK~~IE~~31 EGRR~~IDB~~ 241120[ME70]

EGTT~~ISN~~ SIGMET ~~3~~01 VALID 241120/241500 EGRR~~INN~~-

2. First line of TAC SIGMET in line with Regulation (EU) 2017/373 and its amendments.

WSSQ31 LZIB 251130

LZZB SIGMET T01 VALID 251530/251930 LZIB-

[2] ~~Provisional guidance, pending approval by the EASPG and reflection in the eANP.~~

3.4.3. ***Format of the second line containing the meteorological part of the TAC SIGMET***

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

1	2	3	4	5	6	7
Location indicator of the FIR/UIR or CTA	Name of the FIR or FIR/UIR or UIR or CTA	Status Indicator Test or Exercise	Description of the phenomenon	Observed or forecast*	Location of the phenomenon*	Flight level or altitude and extent*
<CCCC>	<name> FIR [FIR/UIR, UIR, CTA]	[TEST] or [EXER]	<Phenomenon>	OBS [AT <GGggZ>] or FCST [AT <GGggZ>]	Geographical location of the phenomenon given by coordinates, or by reference to lines of latitude and or longitude	FL<nnn/nnn> or [SFC/]FL<nnn> or [SFC/]<nnnn>M or [SFC/]<[n]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<nnn> or <[n]nnnn>FT/FL<nnn>

8	9	10	
Movement or expected movement*	Changes in intensity*	Forecast position at the end of the ~~validity period~~period of validity*	
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 VA cloud or cumulonimbus associated with tropical cyclone [3] covering more than one area within the FIR, these elements can be repeated, as necessary. Each location and forecast position is to be preceded by an observed or forecast time.

[3] ~~Provisional guidance, pending approval by the EASPG and reflection in the eANP.~~

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:

EDWW BREMEN FIR

3.4.3.1.2. TEST or EXER

This field will only be used if the SIGMET ~~message~~ is intended to be used for TEST or EXERCISE purposes. The omission of this field indicates that the SIGMET is intended for operational decision making.

TEST is generally employed in messages without meteorological information, to test the data dissemination (e.g. regular DMG EUR OPMET Warning Monitoring Exercises[4]). When TEST is used, the SIGMET ~~message~~ may end immediately after the word TEST.

EXER is generally used for international exercises where fictional but realistic meteorological information will be used to test coordination or tactical decisions but not for operational purpos~~es~~ (e.g. regular VOLCEX exercises preparing users to the management of a volcano eruption over the European airspace).

When graphically displaying the SIGMET, it is recommended to use appropriate symbols or colours to allow users to clearly identify EXER and TEST SIGMET.

Examples~~-~~:

LECB BARCELONA FIR/UIR **TEST=**

LECB BARCELONA FIR **EXER** SEV TURB OBS NE OF LINE N4120 W00040 - N3830 E00330 FL250/370 MOV ESE 20KT INTSF=

3.4.3.1.3. Phenomenon

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. SIGMET shall be issued only for the following phenomena (with only one phenomenon in each SIGMET) observed or forecast to persist for more than 30 minutes:

[4] EUR/NAT SIGMET test focal points can be accessed at http://www.icao.int/EURNAT/Pages/welcome.aspx (~~-~~ EUR/NAT Documents ---> EUR Documents ---> EUR Documents ---> MET Guidance ---> ~~EUR/NAT Documents; EUR Documents; MET Guidance;~~ EUR/NAT SIGMET test focal points

Phenomenon[1]	**Description in TAC format**	**Meaning**
Thunderstorm[7] (TS)	OBSC[2] TS EMBD[3] TS FRQ[4] TS SQL[5] TS OBSC TSGR[6] EMBD TSGR[6] FRQ TSGR[6] SQL TSGR[6]	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
Turbulence (TURB)	SEV TURB[8]	Severe turbulence
Icing (ICE)	SEV ICE[9] SEV ICE (FZRA)[10]	Severe icing Severe icing due to freezing rain
Mountain wave (MTW)	SEV MTW[11]	Severe mountain wave
Duststorm (DS)	HVY DS[12]	Heavy duststorm
Sandstorm (SS)	HVY SS[12]	Heavy sandstorm
Volcanic ash cloud (VA)	VA (+ volcano name, if known)	Volcanic ash (+ volcano name)
Tropical Cyclone ~~[5]~~(TC)	TC (+TC name)	Tropical cyclone (+ tropical cyclone name)
Radioactive cloud	RDOACT CLD[13]	Radioactive cloud

The notes below refer 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:

1. Only one of the weather phenomena listed should be selected and included in each SIGMET. For multiple and independent occurrences of one phenomenon within the same FIR, individual SIGMETs should be issued.

*2. Obscured (**OBSC**) indicates that the thunderstorm is obscured by haze or smoke. 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. Note that thunderstorm obscuration due to darkness is excluded here, as lightning activity is assumed to increase the visibility of ~~nightly~~ night-time thunderstorms.*

*3. Embedded (**EMBD**) – indicates that the thunderstorm is embedded within cloud layers and cannot be readily recognized. 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. Appropriate satellite imagery, soundings, or radar may help coming to a decision.*

*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). When interpreting the definition of FRQ in ICAO Annex 3, it is considered that a distribution assessed over a domain of approximately 100 km~~KM~~ by 100 km~~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*

~~[5] Provisional guidance, pending approval by the EASPG and reflection in the eANP.~~

'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.

5. *Squall line (**SQL**) indicates thunderstorms along a line with little or no space between individual clouds. This convective system could be stationary or moving, associated with sustained winds, varying rapidly in direction, and possibly strong gusts. When interpreting the definition of SQL in ICAO Annex 3, the thunderstorms along a line without significant gaps and a length of at least 100 km~~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.*

6. ***TSGR**: TSGR should be mentioned when hail is observed on the ground, detected from radar data, or expected from nowcasting / forecasting data. For direct observation, it is proposed to use the 5 mm criterion defined in ICAO Annex 3 (4.4.2.3). Furthermore, as hail is observed ~~observed~~ in mountainous areas it is recommended~~, a proposal was~~ to restrict the criterion to observations below a maximum height of 3000 ft AMSL.*

7. ***Phenomena priority**: When issuing TS SIGMET, when there are multiple occurrences of the listed weather condition occurring simultaneously in the same area, given their impact evaluation from users, the following priority of use should be adopted:*
SQL > FRQ > EMBD > OBSC TS/TSGR

8. *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 not associated with convective clouds exclusively*
   - *turbulence is considered severe whenever the peak value of ~~the cube root of~~ the* [MSD71][ME72]*eddy dissipation rate (EDR[6]) ~~is~~ equals to or ~~above~~ exceeds~~ing~~ 0.45.*

   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 [WC73]*. In addition, in the absence of other information, it is reminded that WAFC SIGWX charts can provide material to issue SIGMET for SEV TURB.*

   The perception of turbulence strongly depends on aircraft type and mass of the aircraft. 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.

9. *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)).*

10. ***FZRA**: 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.

[6] These thresholds apply for a medium-sized transport aircraft under typical en-route conditions (i.e. altitude, airspeed and weight).

- *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.*

Due to the considerable risk of false alarms of FZRA observations from fully automatic observing systems, this information must be treated with caution.~~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 on ground must not be mixed up with the observation of SEV ICE (FZRA) ~~by a pilot~~in flight, 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 has confirmed 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, respecting the guidance provided in 3.4.3.1.5.*

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

*12. Sandstorm/duststorm (**SS**/**DS**) should be considered heavy whenever the visibility is below 200 m and the sky is obscured.*

3.4.3.1.4. Specific conventions for VA and TC SIGMETs

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

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

When the eruption is from a known and named volcano. ~~The name may be up to 10 alphanumeric characters.~~[BK74][ME75][AP76]

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

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).

VA CLD

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 C**. The template for VAA is described in Appendix 2 of Annex 3 (Table A2-1).

For tropical cyclone SIGMET (WC)[7] only, the following conventions should be used:

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

When the tropical cyclone is not yet named.

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

3.4.3.1.5. Indication if the phenomenon is observed or forecast

OBS [AT <GGggZ>]

FCST [AT <GGggZ>]

The indication whether the phenomenon 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.

In the case of OBS AT, the time of the report/observation having triggered or confirmed the phenomenon should be considered. 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 for the forecaster to issue a SIGMET and the preparation time of the SIGMET will lead to a SIGMET start validity time later than the observation.

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 validity periodperiod of validity.

Examples:

OBS

OBS AT 0140Z

FCST

FCST AT 0200Z

It is recommended to use FCST SIGMETs for areas which are regarded as significant by using meteorological methods and forecasting capabilities. OBS SIGMETs imply a higher confidence as they are based on observations such as remote sensing imagery or special air-reports. Therefore, OBS SIGMETs should be limited to the area whicharea, which is represented by observations.

The evaluation which observation is regarded as representative and the linked decision for issuingWhen evaluating whether a FCST and/or OBS SIGMET is issued,s should consideration should be given to the the different perception of both SIGMET types on the user side.

When a FCST SIGMET is already valid and related observations are received, a MWO is expected to consider the re-issuance of an OBS SIGMET only if a significant change of conditions of the SIGMET-phenomenon is discovered for a considerable part of the original SIGMET-area. AfterWhen an already issued the FCST SIGMET expiresends, and if the

phenomenon is still reported to persist~~in observations~~, a new SIGMET shall be issued as an OBS SIGMET for an area which encompasses the information brought by the observations[WC77]. The guidance concerning onward-transmission of special air-reports provided in 2.2.10 should be considered.

3.4.3.1.6. Location of the phenomenon

The location of the phenomenon at the starting time of validity 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. When issuing TAC-SIGMETs, ~~T~~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~~repetition of the start point. ~~The recommended best practice is to list the coordinates in a clockwise order as this is an XML/GML convention.~~

Recommendation for IWXXM SIGMET: Following conventions on spatial schemas (ISO 19107:2019), the coordinate information should be listed counter-clockwise (versus the practice of clockwise order for TAC).

The use of WITHIN is the ~~most~~ preferred way to describe the location of the phenomenon. This phenomenon-based delineation enables translation in to machine-readable formats for~~or~~ ingestion into automated systems used by the airlines for flight planning and in-flight decision making. For tropical cyclone, volcanic ash and radioactive clouds deviating location descriptions are listed below.

1) An area of the FIR or UIR defined by a polygon. The end point should be a ~~repeat~~repetition 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 N5030 E01550 – N5055 E01500 – N5050 E01630 – N5030 E01550

WI N50 E015 – N52 E017 – N48 E020 – N49 E016 – N50 E015

The following are additional ways to describe the location of the phenomenon. They can only be used for SIGMETs in TAC format. Further details as well as guidance for SIGMET polygons in FIRs with complex borders are found in **Appendix C**.

2) In a sector of the FIR (or UIR) defined relative to a set of up to three specified lines in different variations.

For example:

NE OF LINE N5000 E03000 – N4900 E0330

N OF N3300 AND S OF N3600

NE OF LINE N5500 W00450 – N5200 W00410 AND SW OF LINE N5800 W00250 – N5400 W04200

N OF N4700 AND E OF E00830 (effectively a quadrant)

N OF N5730 (effectively a segment)

W OF E020 (effectively a segment)

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

Note: Tthis is not recommended to be used as it is not in line with SIGMET minimum size. Information concerning SIGMET phenomena of transient and local nature should be made available by issuing special air-reports.

For example:

N5530 E01230

N46 E007

4) Within a specified radius of the centre of a tropical cyclone [7]

For example:

WI 400KM OF TC CENTRE

WI 250NM OF TC CENTRE

5) Within a specified radius of the location of a radioactive release event.

For example:

WI 30KM OF N5030 E00550

WI 16NM OF N4911 E01415

A radius of up to 30 kilometres (or 16 nautical miles) from the source of the radioactive release and a vertical extent from surface (SFC) to the upper limit of the flight information region (FIR/UIR) or control area (CTA) is to be applied.

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

For example:

ENTIRE FIR

ENTIRE CTA

[7] Provisional guidance, pending approval by the EASPG and reflection in the eANP.

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

3.4.3.1.7. 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 only)

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;

  For example: **FL250/290**

- reporting the top of a phenomenon with reference to one flight level (applies to TS SIGMET or if 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[8] [BK78][ME79][AP80]

  For example: **TOP BLW FL450**

[8] ~~Provisional guidance, pending approval by the EASPG and reflection in the eANP.~~

3.4.3.1.8. Movement

Note: This option must not be used in combination with the 'Forecast position' section of SIGMET. Only one of the two options may be used, not both.[BK81]

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

MOV NNW 30KMH

MOV E 25KT

STNR

3.4.3.1.9. Expected changes in intensity

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

INTSF – intensifying

WKN – weakening

NC – no change

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

3.4.3.1.10. 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'.

3.4.3.1.11. Forecast position at the end of the SIGMET ~~validity period~~period of validity[WC82][ME83]

Forecast position of the phenomenon at the end of the ~~validity period~~period of validity 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 3.4.3.1.6 above.

The ~~levels~~ vertical boundaries of the phenomenon are considered to remain fixed throughout the SIGMET ~~validity period~~period of validity because there is currently no provision for indicating changes to the levels.

If the forecast position of a SIGMET is expected to leave the FIR/UIR, the ~~validity period~~period of validity and forecast position should be selected to end the SIGMET validity at the border to enable coordination and handover to the neighbouring MWO as recommended in Chapter 2.5.

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 B ~~-~~and C** of this Guide.

3.4.4. ***Cancellation of SIGMET***

3.4.4.1. If, during the ~~validity period~~period of validity 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.

3.4.4.2. The cancellation is carried out 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~~period of validity 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~~period of validity.

Examples:

1. Cancellation of a WS SIGMET with the original first line

   WSGR31 LGAT 101200

   LGGG SIGMET 5 VALID 101200/101600 LGAT-

   LGGG ATHINAI FIR …

   Cancellation SIGMET:

   WSGR31 LGAT 101430

LGGG SIGMET 6 VALID 101430/101600 LGAT-

LGGG ATHINAI FIR CNL SIGMET 5 101200/101600=

2. Cancellation of a WV SIGMET

WVNO31 EKCH 131518

EKDK SIGMET A03 VALID 131515/132115 EKMI-

EKDK KOBENHAVN FIR …

Cancellation SIGMET:

WVNO31 EKCH 132000

EKDK SIGMET A04 VALID 132000/132115 EKMI-

EKDK KOBENHAVN FIR CNL SIGMET A03 131515/132115 VA MOV TO ESAA FIR=

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

3.4.4.3. If it is known that an existing SIGMET no longer accurately describes the existing or expected future evolution of the phenomenon or there is a significant error/mistake in the SIGMET 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.

3.4.4.4. 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):

WSBX31 EBBR 201855

EBBU SIGMET U01 VALID 202000/210000 EBBR-

EBBU BRUSSELS FIR SEV TURB FCST WI N5107 E00357 – **N5105 E00500 – N5015 E00535** – N5040 E00333 – N5107 E00357 SFC/FL120 STNR WKN=

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

WSBX31 EBBR 202155

EBBU SIGMET U02 VALID 202155/210000 EBBR-

EBBU BRUSSELS FIR SEV TURB FCST WI N5107 E00357 – **N5100 E00432 – N5010 E00427** – N5040 E00333 – N5107 E00357 SFC/FL120 STNR WKN=

Cancellation SIGMET (this cancels the original SIGMET):

WSBX31 EBBR 202156

EBBU SIGMET U03 VALID 202156/210000 EBBR-

EBBU BRUSSELS FIR CNL SIGMET U01 202000/210000=

Furthermore, if a SIGMET is cancelled before it becomes valid, 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):

WSBX31 EBBR 201855

EBBU SIGMET U04 VALID 202000/202300 EBBR-

EBBU BRUSSELS FIR SEV TURB FCST WI N5107 E00357 – N5105 E00500 – N5015 E00535 – N5040 E00333 – N5107 E00357 SFC/**FL020** STNR WKN=

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

WSBX31 EBBR 201900

EBBU SIGMET U05 VALID 202000/202300 EBBR-

EBBU BRUSSELS FIR SEV TURB FCST WI N5107 E00357 – N5100 E00432 – N5010 E00427 – N5040 E00333 – N5107 E00357 SFC/**FL120** STNR WKN=

Cancellation SIGMET (this cancels the original incorrect SIGMET)

WSBX31 EBBR 201905

EBBU SIGMET U06 VALID 202000/202300 EBBR-

EBBU BRUSSELS FIR CNL SIGMET U04 202000/202300=

PART 4. RULES FOR PREPARATION OF AIRMET ~~INFORMATION~~[OF(84]

4.

4.1. General

4.1.1. AIRMET ~~messages~~ means information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and of the development of those phenomena in time and space, and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof[WC85]. ~~provide information on the occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which were not already included in the forecasts issued for low-level flights in the flight information region~~.

4.1.2. AIRMET~~s~~ 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, to be decided by a state and accepted via ICAO state letter process~~if agreed on so between the users and the meteorological authority concerned~~[BK86][ME87][AP88]. The requirements for the issuance of AIRMET are provided 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).

4.1.3. An AIRMET is issued for a FIR; where necessary, the FIR should be divided in sub-areas and separate AIRMET issued for the entire FIR or sub-area(s) ~~of the FIR~~thereof.

4.1.4. When issuing AIRMET ~~information~~, MWOs should pay attention on ~~the~~ related products, such as GAMET, SIGMET and LLSWC (low-level significant weather chart[9]), in order to avoid duplication, as AIRMET addresses phenomena which were not already included in these products. An inventory on regional exchange of GAMET and graphical products to support low-level flights is provided at the following link: https://www.icao.int/EURNAT/Pages/welcome.aspx (EUR/NAT Documents ---> EUR Documents ---> EUR Documents ---> MET Guidance ---> Headers and exchange – GAMET for LLF ~~Flight~~).

4.1.5. 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 (and SIGMET) in Traditional Alphanumeric Code (TAC) format 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. *For more information; please refer to EUR Doc 018, EUR Doc 020 and WMO No. 306 Volume I.3.*

4.1.6. 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~~ has~~ve~~ to be strictly followed [BK89]~~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.

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

4.1.8. After issuing an AIRMET, the MWO maintains watch over the evolution of the phenomenon for which the AIRMET has been issued and issues a new updated AIRMET when necessary.

~~4.1.9.~~ An AIRMET~~s~~ should be cancelled promptly when the phenomenon is no longer occurring or no longer expected to occur in the MWO's ~~area of responsibility~~AOR. The AIRMET is understood to ~~cancel itself~~

[9] In some states with applicability of (EU) No. 2017/373 and its amendments, individually accepted as replacement for GAMET and AIRMET

automatically expire at the end of its ~~validity period~~period of validity. If the phenomenon persists and is not addressed in another regular low-level forecast product ~~addresses it~~, ~~a~~ new AIRMET ~~message~~ for a further period of validity ~~has~~ is to be issued.

4.2. Structure of the AIRMET ~~message~~[WC90]

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[WC91].

4.3. Format of AIRMET

Note 1: ~~In~~ In the following text, square brackets - [ ] - are used to indicate an optional or conditional ~~element,~~element and angled brackets - <> - for symbolic representation of a variable element, which in the real AIRMET 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 structured as follows~~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 designator	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~~centre that 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[10]. 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]*

4.3.2. ***First line of TAC 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~~Period of validity 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:

LIMM AIRMET 3 VALID **110800/111200** LIIP-~~**EDWW AIRMET 3 VALID 121100/121500 EDZF** -~~[ME92]

EPWW AIRMET 5 VALID 061535/061935 EPWA-

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

[BK93]

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

- the period of validity of an AIRMET shall not exceed 4 hours;
- in case of an 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~~period of validity;
- when the AIRMET is issued for an expected phenomenon:
  - the beginning of the ~~validity period~~period of validity should correspond to the time the phenomena is expected to commence
  - the ~~validity period~~period of validity of AIRMET ~~information~~ should be coordinated with the dissemination of regular forecasts for low level flights.~~,~~ K~~k~~eeping in mind that AIRMET is intended as supplementary information and the respective phenomena should already be covered by the regular forecast products, the lead time (the time of issuance of the AIRMET) should not be ~~not~~ more than 4 hours before the start of ~~validity period~~period of validity (i.e., expected time of occurrence of the phenomenon).[BK94][ME95] If the forecaster has unambiguous information for the occurrence of a phenomenon, it is recommended to aim for a lead time of at least 30 minutes.

4.3.2.4.

~~4.3.2.4.~~ In addition, the minimum horizontal extent and duration of the hazardous ~~area~~ phenomenon for reporting TURB, ICE, MTW, TS and TSGR in AIRMET should have~~,~~ a minimum duration of 30 minutes ~~respectively:~~

~~- have a longest diagonal or side of the polygon representative of the whole hazardous area (independent of the FIR boundaries) of 100 km[WC96][AP97];~~

~~- have a minimum duration of 30 minutes~~.[BK98]

4.3.2.5. 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~~ WANL41 ~~EDZF~~ EHDB 070015[ME99]

~~EDGG~~ EHAA AIRMET 01 VALID 070015/070300 ~~EDZF~~EHDB-

~~EDGG~~ EHAA ~~LANGEN~~ AMSTERDAM FIR ISOL TS OBS ~~N OF~~WI ~~N49~~ N52 E003 – N52 E004 – N51 E004 – N51 E003 TOP FL330 MOV E WKN=

2. AIRMET for a forecast phenomenon:

~~WASW41~~ WARO31 ~~LSSW~~ LROM 061758[BK100]

~~LSAS~~ LRBB AIRMET 5 VALID 061800/062100 L~~SZH~~ROM-

~~LSAS~~ LRBB BUCURESTI ~~SWITZERLAND~~ FIR MOD TURB FCST AT 1800Z WI N4730 E02550 – N4650 E02500 – N4550 E02630 – N4530 E02550~~W OF E007~~

SFC/FL160 STNR NC=

[BK101]

4.3.3. *Format of the second line containing the meteorological part of TAC AIRMET*

4.3.3.1. Format of the second line containing the meteorological part of TAC AIRMET

1	2	3	4	5	6	7
Location indicator of the FIR or CTA	Location indicator and name of the FIR/CTA, or part thereof for which the AIRMET is issued	Status indicator: test or exercise	Description of the phenomenon	Observed or forecast	Location (referring to latitude and longitude (in degrees and minutes))	Level
<CCCC>	<name> FIR[/n]	TEST or EXER	<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>FT or [SFC/]<nnnn>M 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<nnn> or [<[n]nnnn>FT/]FL<nnn>

8	9

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

^when FIR is divided into sub-areas: separate AIRMETs 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

Llocation indicator <name> FIR[/n]

Example:

EBBU **BRUSSELS FIR**

4.3.3.1.2. TEST or EXER

This field will only be used if the AIRMET message is intended to be used for TEST or EXERCISE purposes. The omission of this field indicates that the AIRMET is intended for operational decision making.

When graphically displaying the AIRMET, it is recommended to use appropriate symbols or colours to allow users to clearly identify EXER and TEST AIRMET.

- TEST is generally employed in messages without meteorological information, to test the data dissemination (e.g. regular DMG EUR OPMET Warning Monitoring Exercises). When TEST is used, the AIRMET message may end immediately after the word TEST.
- EXER is generally used for international exercises where fictional but realistic meteorological information will be used to test coordination or tactical decisions but not for operational purpospurposees (e.g. regular VOLCEX exercises preparing users to the management of a volcano eruption over the European airspace).

4.3.3.1.3. Phenomenon

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. 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 [11], where necessary):

[11] *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)*– Chap 1, Vol II, ICAO Doc 8168 - *Aircraft Operations*

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[4]TS OCNL[5]TS ISOL[4] TSGR OCNL[5] TSGR	Isolated thunderstorm(s) Occasional thunderstorm(s) Isolated thunderstorm(s) with hail Occasional thunderstorm(s) with hail
Mountain obscuration	MT OBSC[6]	Mountains obscured
Cloud	BKN CLD (+height[3]) OVC CLD (+height[3]) ISOL[4] CB OCNL[5] CB FRQ[7] CB ISOL[4] TCU OCNL[5] TCU FRQ[7] 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[8] ICE	Moderate icing
Turbulence	MOD[9] TURB	Moderate turbulence
Mountain wave	MOD[10] 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. (~~r~~Reference: EUR eANP, VOLUME II, PART V – METEOROLOGY, EXAMPLE FOR SPECIFIC REGIONAL REQUIREMENTS)

3. *Refer to ~~ICAO~~ Annex 3, Appendix 3, 4.5.3: The height of cloud base shall be reported above aerodrome elevation, unless precision approach procedures make local arrangements necessary, or reports are made by offshore structures*

*4. 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)*

*5. 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)*

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

*7. 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). Note that FRQ TS corresponds the issuance of a SIGMET, not an AIRMET*

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

*9. 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 not associated with convective clouds exclusively;*[MSD102][OF(103]
- *Turbulence is considered moderate when the peak value of the EDR is equal to or exceeding ~~above~~ 0.20 but~~and~~ below 0.45.*

*10. 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.*

4.3.3.1.4. Indication if the phenomenon is observed or forecast

OBS [AT <GGggZ>]

or

FCST [AT <GGggZ>]

The indication whether the phenomenon 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 ~~validity period~~period of validity.

Examples:

OBS

OBS AT 0140Z

FCST

FCST AT 0200Z

4.3.3.1.5. 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. For TAC AIRMETs, 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~~repetition of the start point).~~The recommended best practice is to list the coordinates in a clockwise order as this is an XML/GML convention~~[WC104].

Recommendation for IWXXM AIRMET: Following conventions on spatial schemas (ISO 19107:2019), the coordinate information should be listed counter-clockwise (versus the practice of clockwise order for TAC).

The use of WITHIN 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~~repetition 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

For the usage of polygon AIRMETs within FIRs with complex boundaries, further guidance is given in **Appendix C**.

The following are additional ways to describe the location of the phenomenon (however they can only be used for AIRMETs in TAC format). Further details are found in **Appendix B and C**.

2) In a sector of the FIR (or UIR) defined relative to a set of up to three specified lines in different variations.

For example:

NE OF LINE N5500 W00700 – N5000 W00300

N OF N4500 AND S OF N4750

NE OF LINE N5500 W00700 – N5000 W00300 AND SW OF LINE N5900 W00850 – N5200 W00200

N OF N4200 AND E OF E01530 (effectively a quadrant)

N OF N5230 (effectively a segment)

W OF E020 (effectively a segment)

3) At a specific point within the FIR (or UIR).

Note: ~~T~~this is ~~not recommended to be used as it is not in line with AIRMET minimum size.~~ Information concerning AIRMET phenomena of transient and local nature shall be made available by issuing special air-reports if suitable.

For example:

N5530 W00230

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

For example:

ENTIRE FIR

ENTIRE CTA

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

4.3.3.1.6. 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: **1500/3000M 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: **2000M/FL100 or 3000FT/FL100 or FL060/150**

Additional examples:

ISOL CB … TOP ABV FL100

MOD TURB … FL050/080

MOD ICE … SFC/FL090

MOD MTW … FL060/180

Recommendation: If possible and known, the actual vertical boundaries of an AIRMET phenomenon should be reported regardless of the limitations of the initial forecast issued for low level flights.

4.3.3.1.7. 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 does not enable AIRMET to contain explicit forecast position as ~~per~~ in SIGMET ~~message~~.

4.3.3.1.8. 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

[BK105]

4.3.4. ***Cancellation of AIRMET***

4.3.4.1. If, during the ~~validity period~~period of validity 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~~period of validity 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~~period of validity.

Examples:

Cancellation of AIRMET with the following first line:

WACR40 LEMM 151520

GCCC AIRMET 1 VALID 151520/151800 LEMM-

GCCC CANARIAS FIR …

Cancellation AIRMET:

WACR40 LEMM 151650

GCCC AIRMET 2 VALID 151650/151800 LEMM-

GCCC CANARIAS 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):

WAPL31 EPWA 201855

EPWW AIRMET 01 VALID 202000/210000 EPWA-

EPWW WARSZAWA FIR MOD TURB FCST WI **N5320 E01550 – S5315 E01830** ~~–~~ N5155 E01807 – N5215 E01547 SFC/FL120 MOV SE 12KT WKN=

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

WAPL31 EPWA 202155

EPWW AIRMET 02 VALID 202155/210000 EPWA-

EPWW WARSZAWA FIR MOD TURB FCST WI **N5420 E01450 – S5415 E01930** ~~–~~ N5155 E01807 – N5215 E01547 SFC/FL120 MOV SE 12KT WKN=

Cancellation AIRMET (this cancels the original AIRMET):

WAPL31 EPWA 202156

EPWW AIRMET 03 VALID 202155/210000 EPWA-

EPWW WARSZAWA FIR CNL AIRMET 01 202000/210000=

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

Abbreviation	Decode
ABV	Above
AIRMET	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations
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
EXER	Exercises or exercising or to exercise
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
N	North *or* northern latitude

Abbreviation	Decode
NC	No change
NE	North-east
NM	Nautical miles
NN	No name, unnamed
NNE	North-Northeast
NNW	North-Northwest
NW	Northwest
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 and other phenomena in the atmosphere that 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	Southwest
TC	Tropical cyclone
TCU	Towering Cumulus
TEST*	Test (indicator of test message)
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 - Guidelines for reporting geographical coordinates in SIGMET and AIRMET in TAC format[WC106]

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~~repetition 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 C - 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 SIGMETs should be displayed*[WC107][AP108].

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.

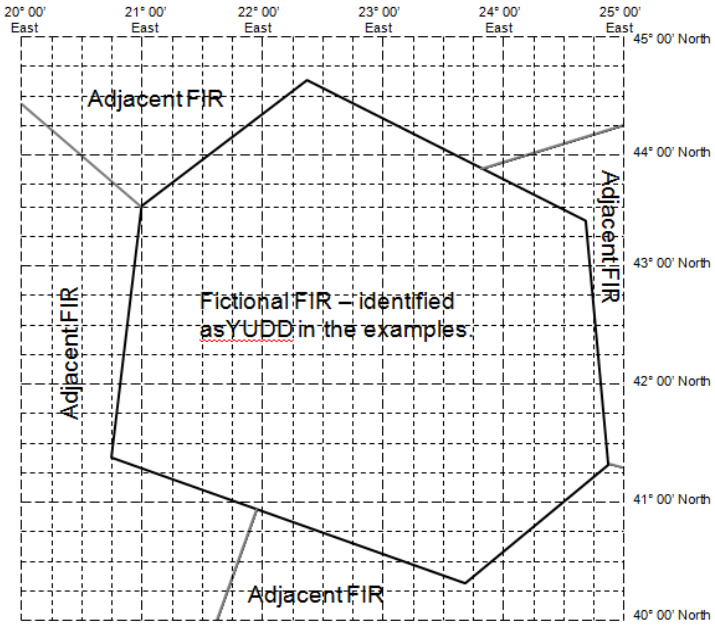
Contents

General

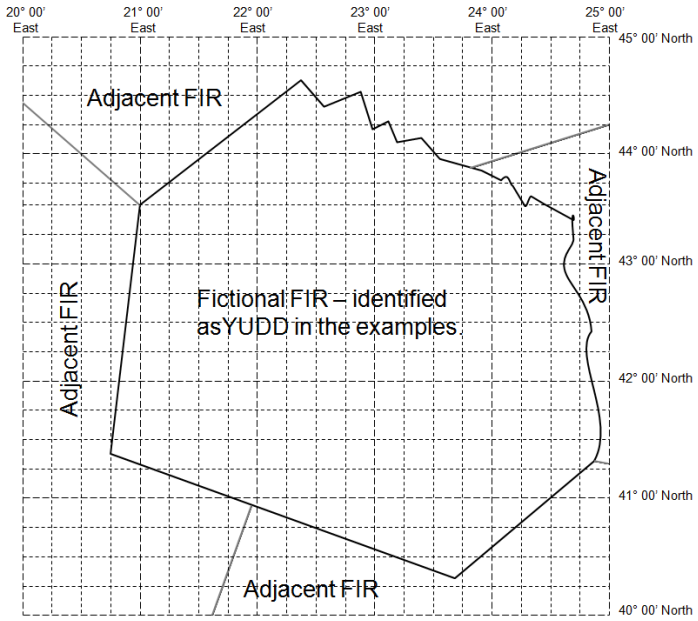
In the following paragraphs, some examples of SIGMET are provided in TAC format.

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~~repetition 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

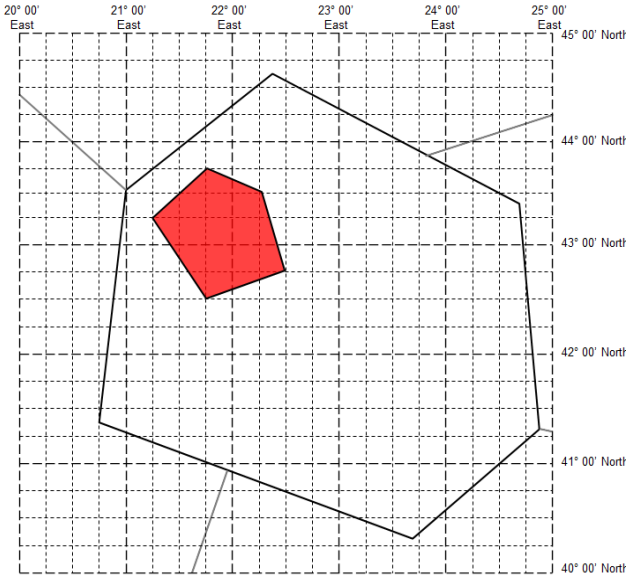
In accordance with practices and procedures laid down for other aeronautical bulletins and international practice (e.g. BUFR encoding of WAFS significant weather (SIGWX) forecasts), it is recommended that the points of a polygon are provided in a 'clockwise' sense. This assists automated systems in determining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

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

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 defined by a polygon. The end point should be a ~~repeat~~repetition of the start point. Points of a polygon are provided in a 'clockwise' sense.

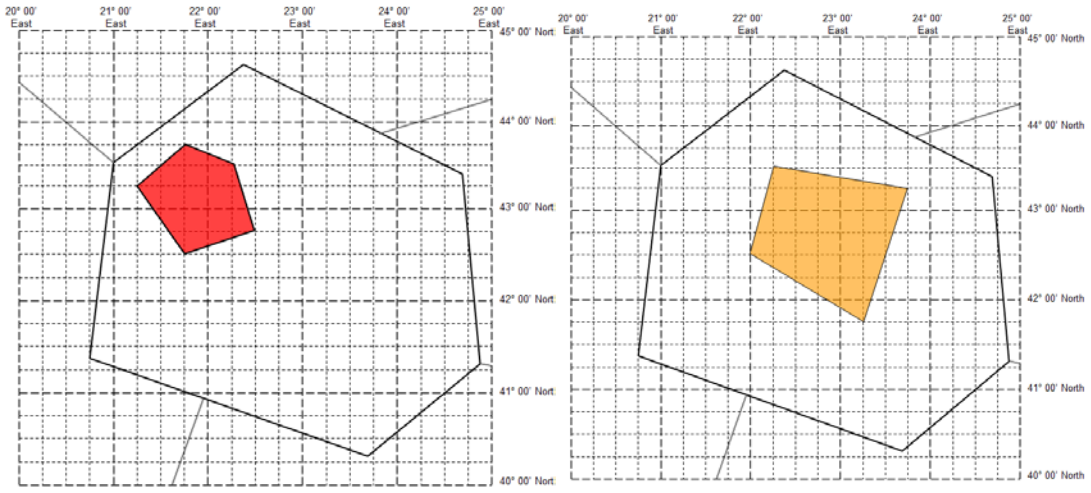
When the SIGMET does not include a 'forecast position' section.



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=

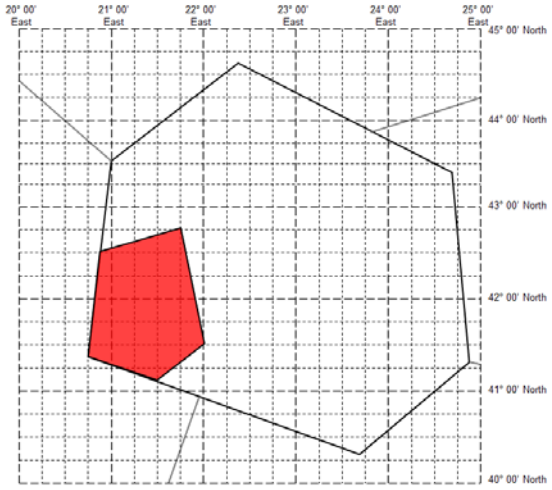
With an explicit forecast position:



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=

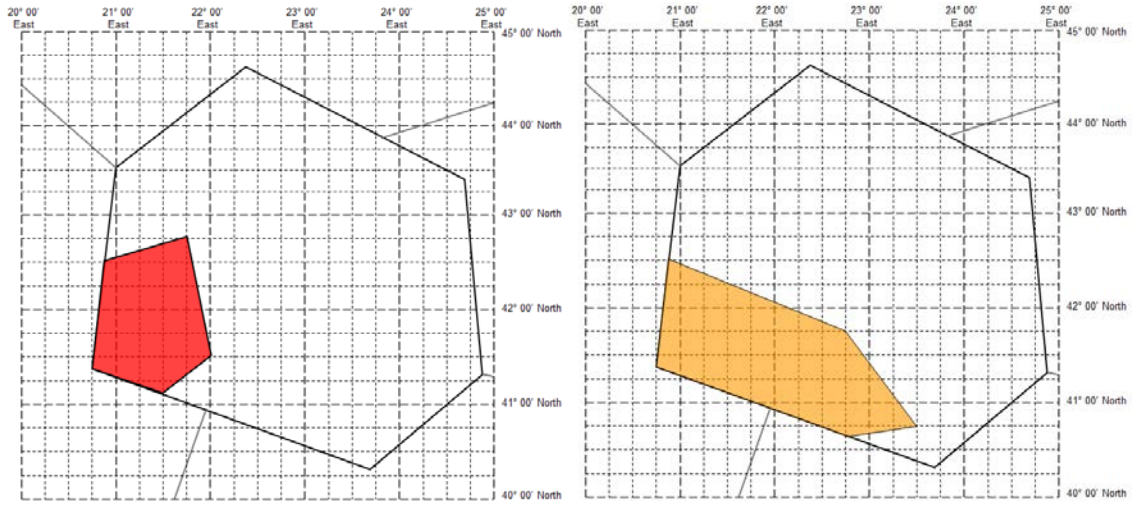
When the SIGMET does not include a ‘forecast position’ section.



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–

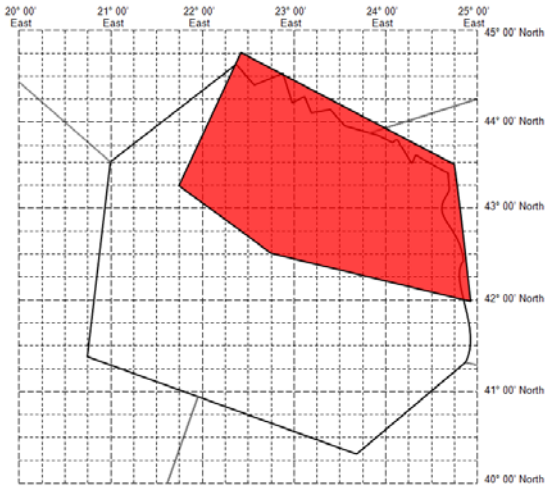
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02052 – N4245 E02145 – N4130 E02200 – N4107 E02130 – N4123 E02045- N4230 E02052 FL250/370 WKN FCST AT 1600Z WI N4230 E02052 – N4145 E02245 – N4045 E02330 – N4040 E02248 – N4123 E02045- N4230 E02052=

Use of polygons with complex FIR boundaries.

Annex 3 specifies that the points of a polygon '... are to 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.

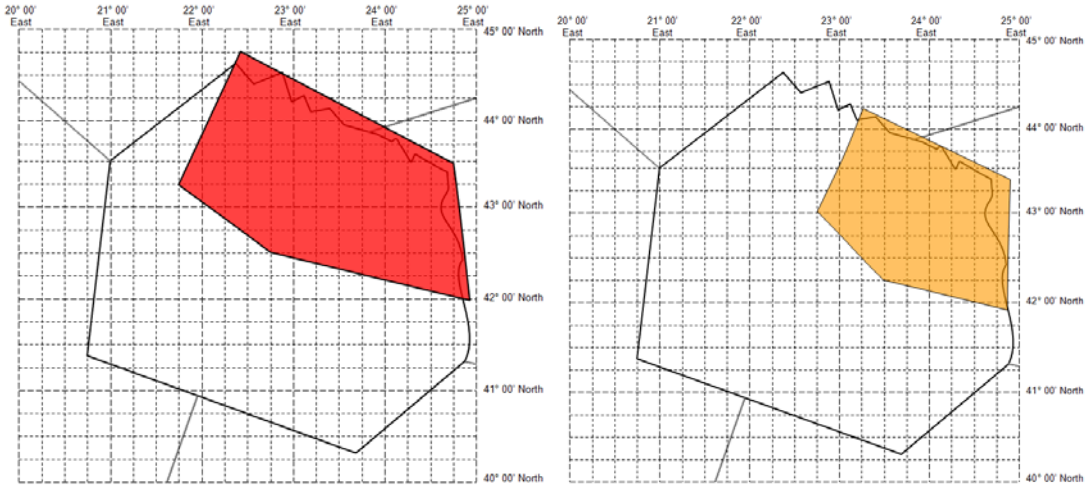
In the examples below, it would not be practical to follow the north-eastern boundary of the FIR exactly. The point close to N4330 E02245 is obviously a 'major' turning point along the FIR boundary, but the other, numerous and complex turning points can only be approximated when constrained to seven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

With reference to a LINE, described with latitude/longitude of two to four points. The start and end 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]>]

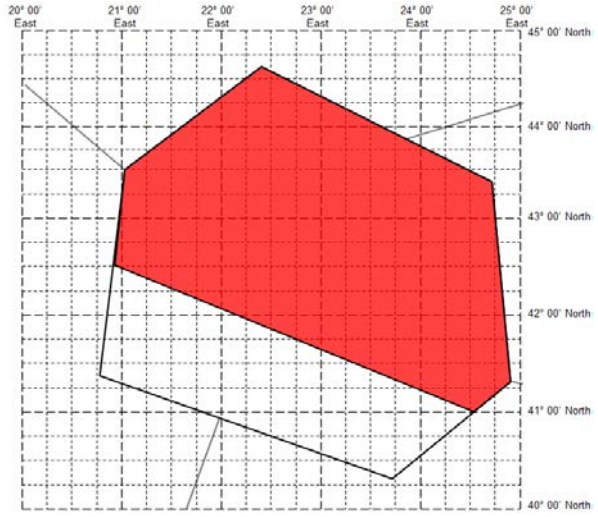
For example:

NE OF LINE N2500 W08700 – N2000 W08300

SE OF LINE N3730 W01230 – N4000 W01130 – N3830 W01030 – N3800 W00945

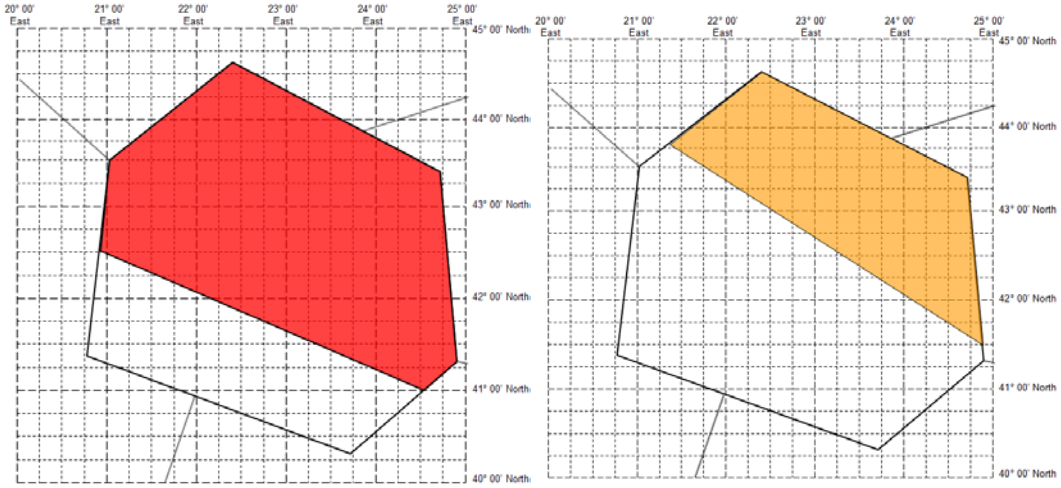
W OF LINE N20 E042 – N35 E045

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=
```

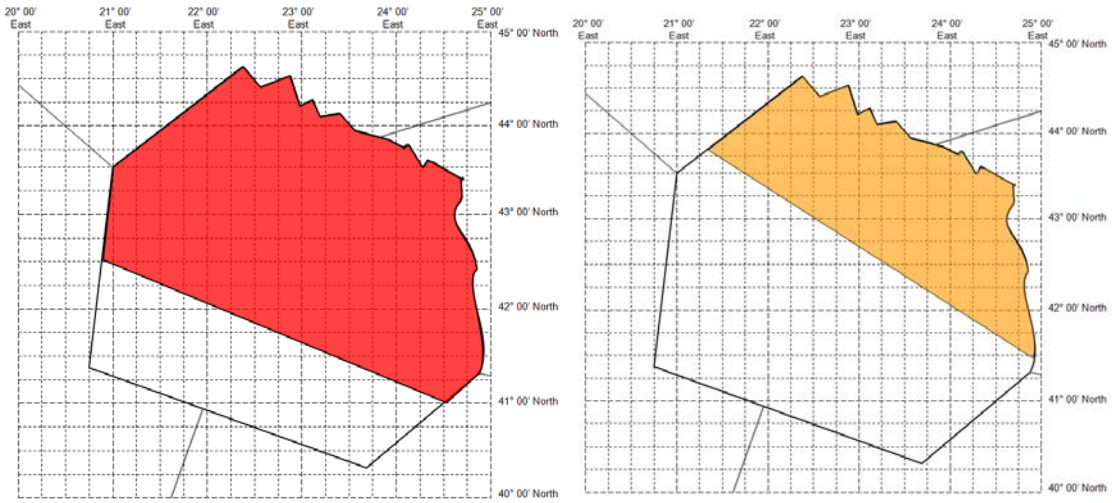
With an explicit forecast position:



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=

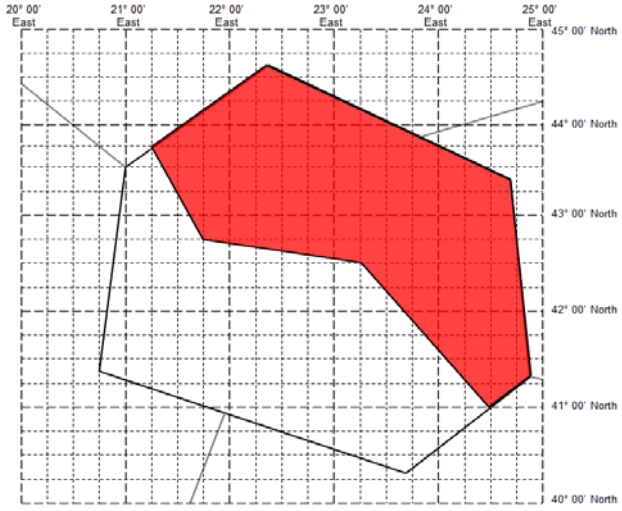
A separate example is provided below illustrating a case where the north-eastern boundary is complex.



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=

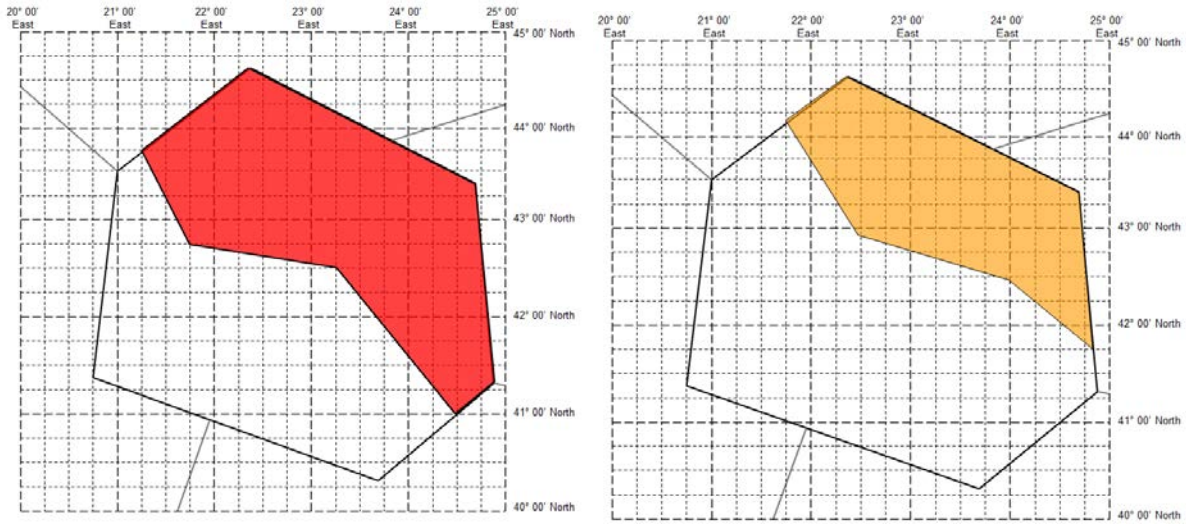
For a series of connected lines when the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4345 E02115 – N4245 E02145 - N4230 E02315 – N4100 E02430 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 N4345 E02115 – N4245 E02145 - N4230 E02315 – N4100 E02430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4411 E02145 – N4255 E02228 - N4228 E02400 – N4130 E02450=

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]>

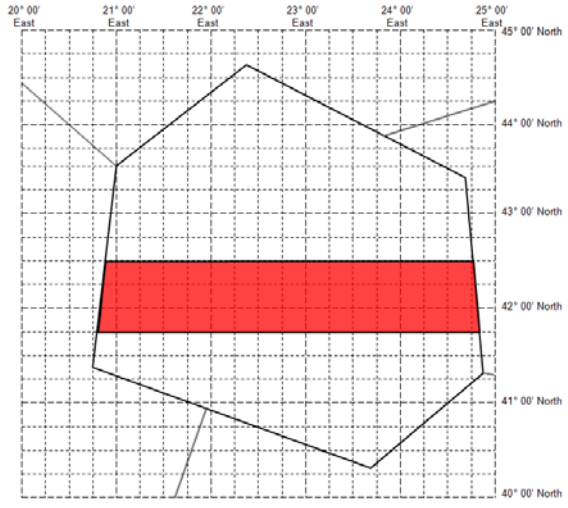
Chosen so that the affected area is between lines of latitude or between lines of longitude.

For example:

N OF N1200 AND S OF N2530

W OF W060 AND E OF W082

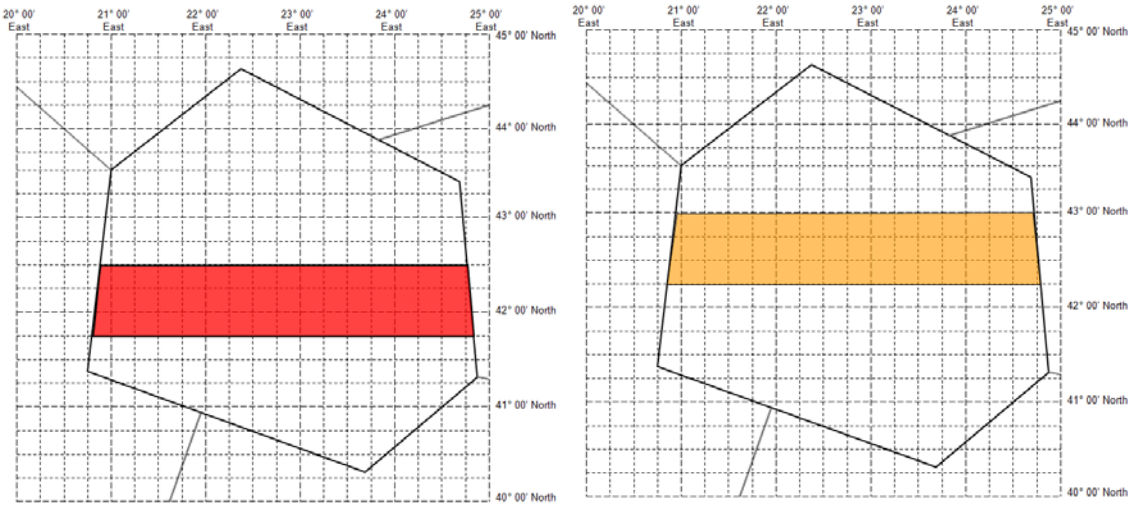
When the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR SEV TURB FCST N OF N4145 AND 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 N4145 AND S OF N4230 FL250/370 WKN FCST AT 1600Z N OF N4215 AND S OF N4300=

(Ssimilar 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)

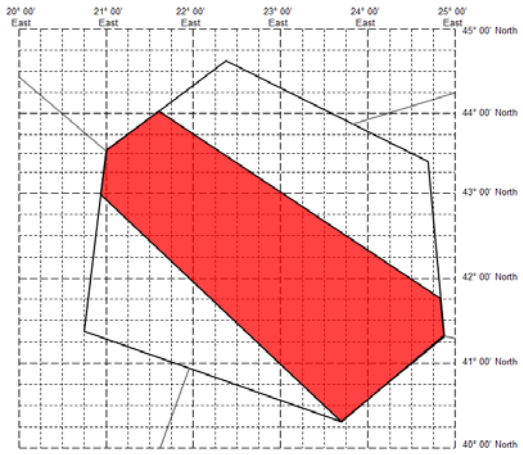
<N OF>or<NE OF>or<E OF>or<SE OF>or<S OF>or<SW OF>or<W OF>or<NW OF> LINE <Nnn[nn]>or<Snn[nn]> <Wnnn[nn]>or<Ennn[nn]> - <Nnn[nn]>or <Snn[nn]> <Wnnn[nn]>or<Ennn[nn]>[- <Nnn[nn]>or<Snn[nn]> <Wnnn[nn]>or <Ennn[nn]>][- <Nnn[nn]>or<Snn[nn]> <Wnnn[nn]>or<Ennn[nn]>] **AND <N OF>or <NE OF>or<E OF>or<SE OF>or<S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

For example:

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

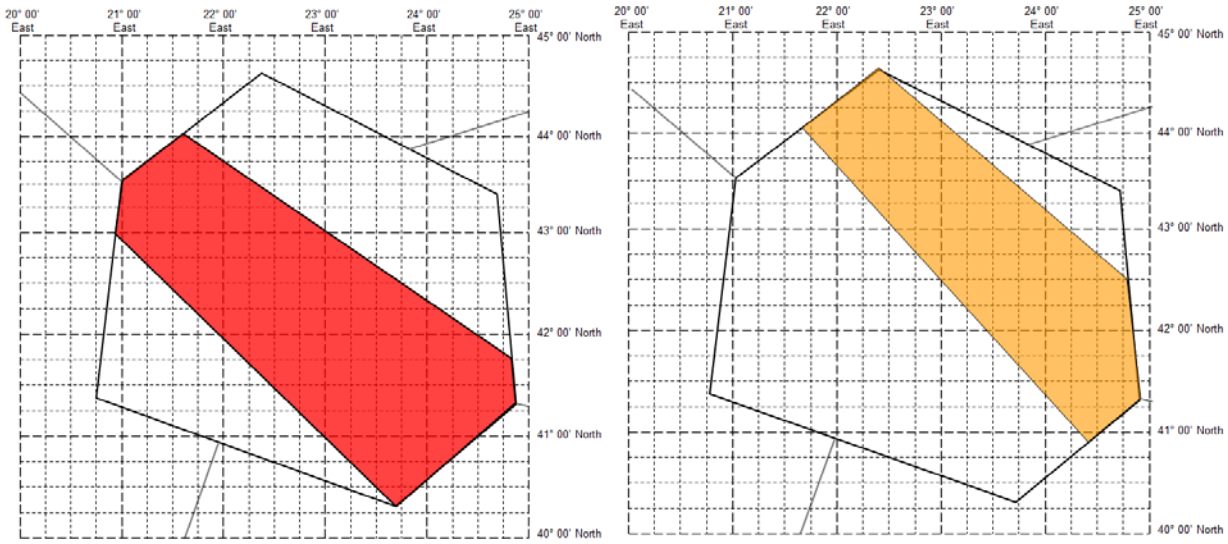
W OF LINE N20 E042 – N35 E045 AND E OF LINE N20 E039 – N35 E043

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 E02450 FL250/370 MOV NE 20KT WKN=
```

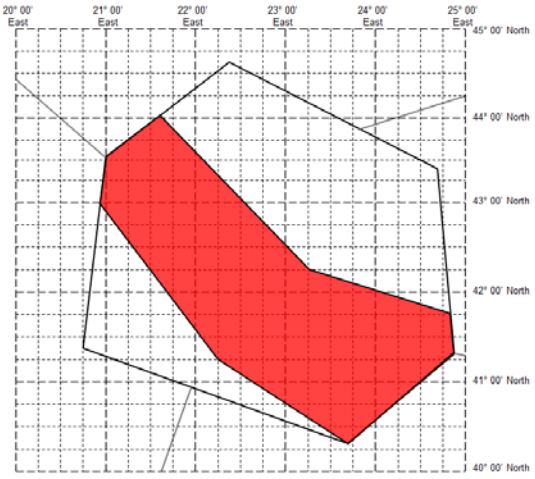
With an explicit forecast position:



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4145 E02450 FL250/370 WKN FCST AT 1600Z NE OF LINE N4403 E02140 – N4055 E02422 AND SW OF LINE N4437 E02222 – N4230 E02447=

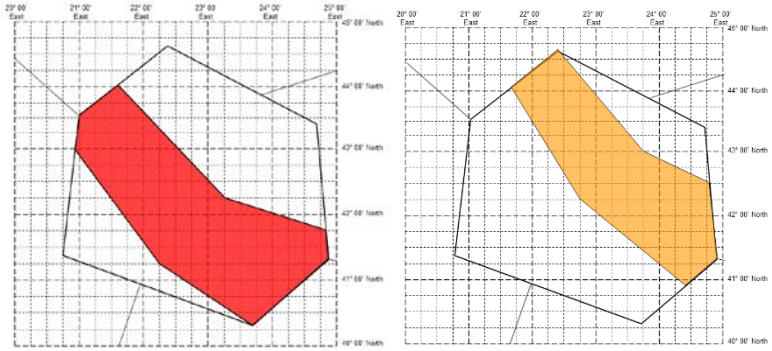
For a series of connected lines when the SIGMET does not include a 'forecast position' section.



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)

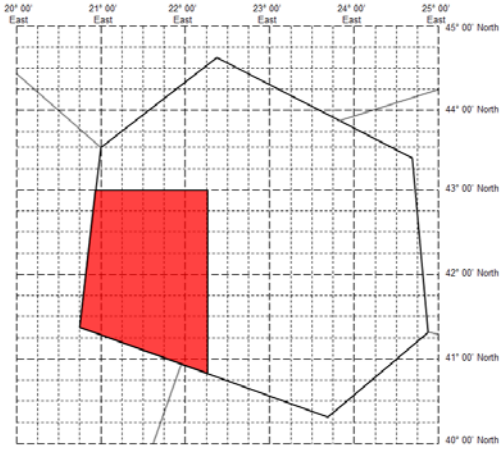
<N OF>or<S OF> <Nnn[nn]>or<Snn[nn]> AND <E OF>or<W OF> <Ennn[nn]> or<Wnnn[nn]>

For example:

N OF N1200 AND E OF W02530

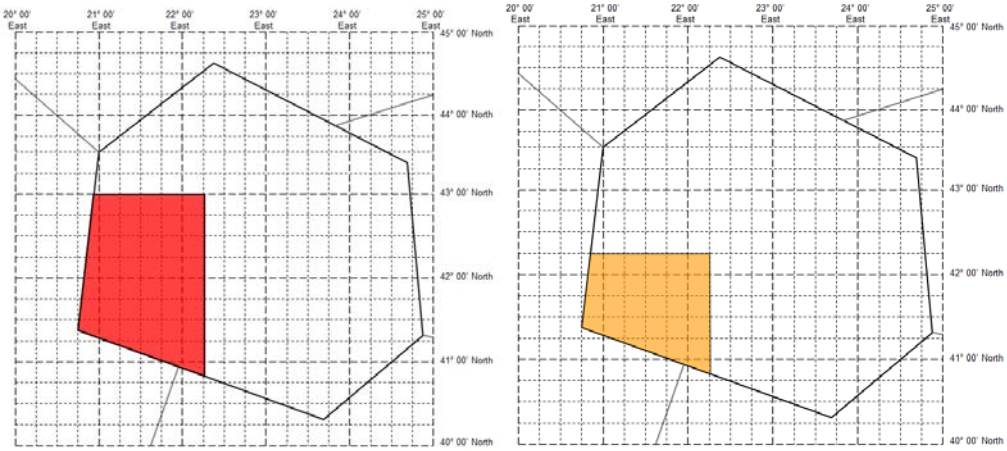
S OF N60 AND W OF E030

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).

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

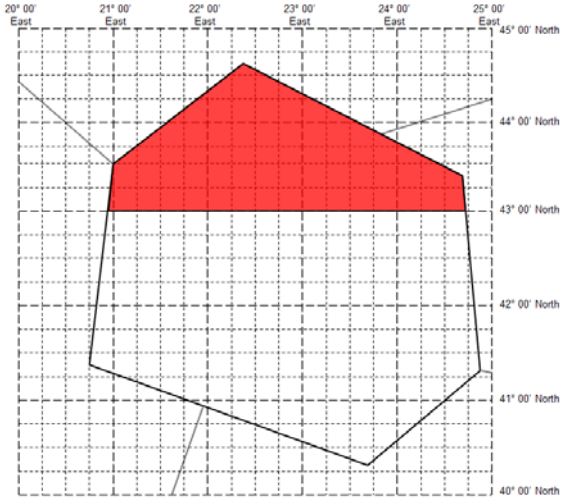
Indication of a part of the FIR with reference to a longitude:

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

For example:

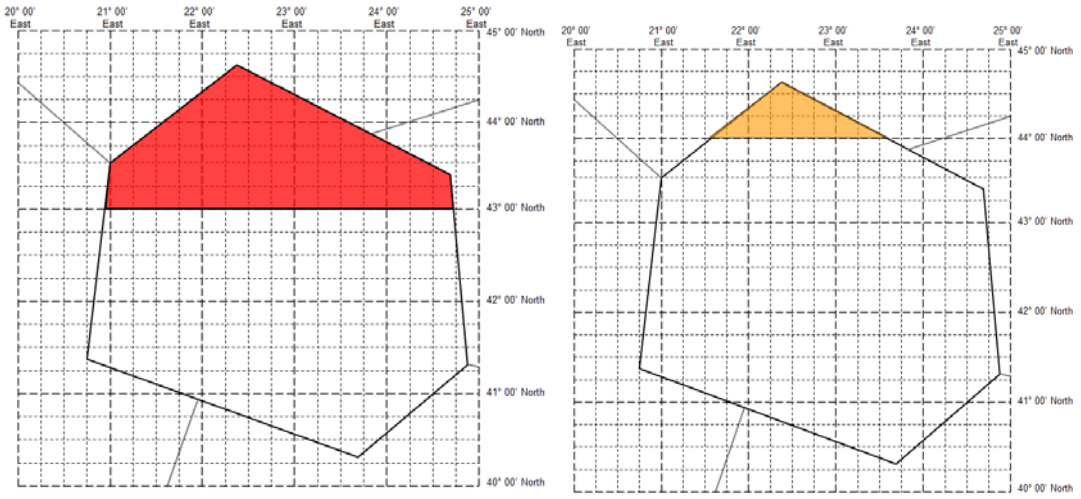
W OF E080

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



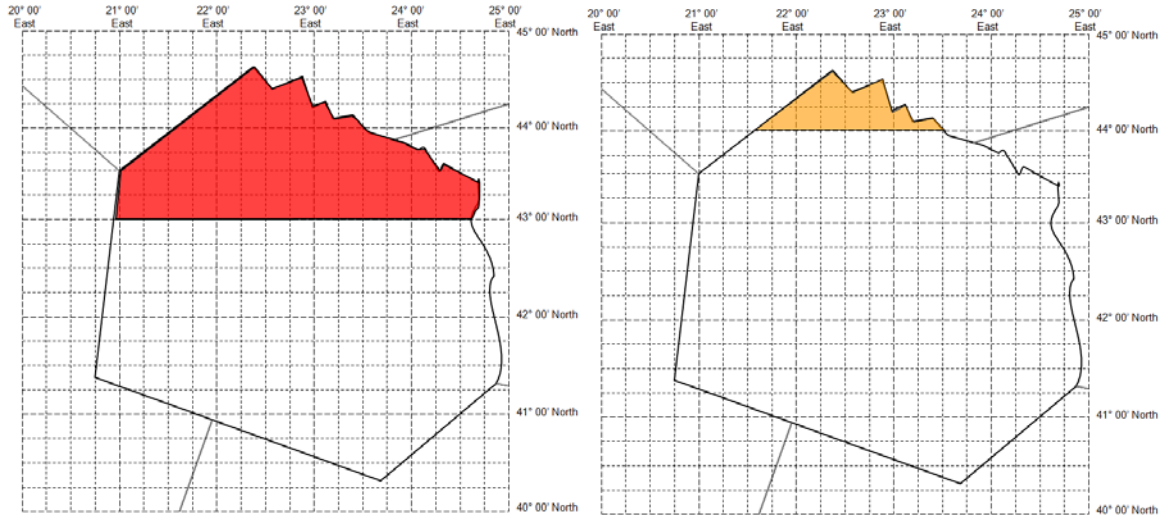

```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43 FL250/370 MOV N 15KT WKN=
```

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[12] FL250/370 WKN FCST AT 1600Z N OF N44=



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43[13] FL250/370 WKN FCST AT 1600Z N OF N44=

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

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

At METP/2, Decision 8/3 recommended that the term 'APRX' was removed from the regional SIGMET guide template (and therefore this document) and was 'not recommended for use'. -WI should be used as an alternative descriptor.

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]>]

For example:

APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010

4) At a specific point within the FIR;

Note: Tthis is not recommended to be used as it is not in line with SIGMET minimum size. Information concerning SIGMET phenomena of transient and local nature should be made available by issuing special air-reports

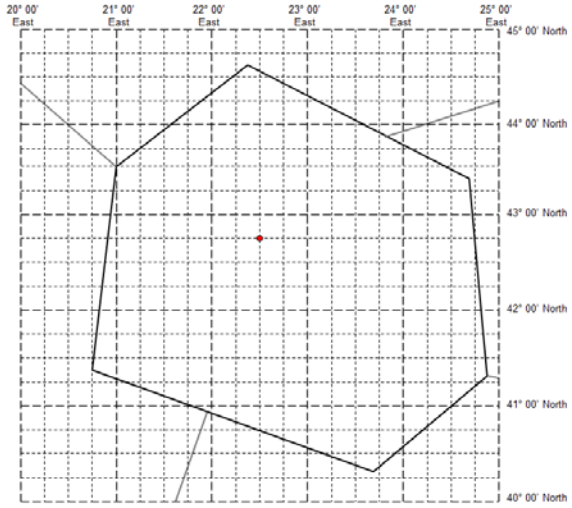
At a specific point within the FIR, indicated by a single coordinate of latitude and longitude

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

For example: N5530 W02230

S23 E107

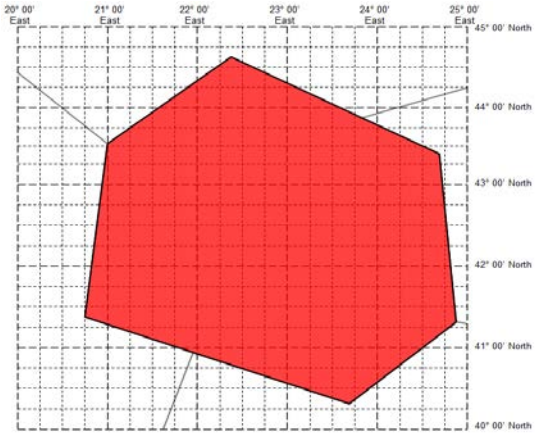
When the SIGMET does not include a 'forecast position' section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR/UIR SEV TURB OBS N4245 E02230 FL250/370 STNR WKN=

5) Covering entire FIR.

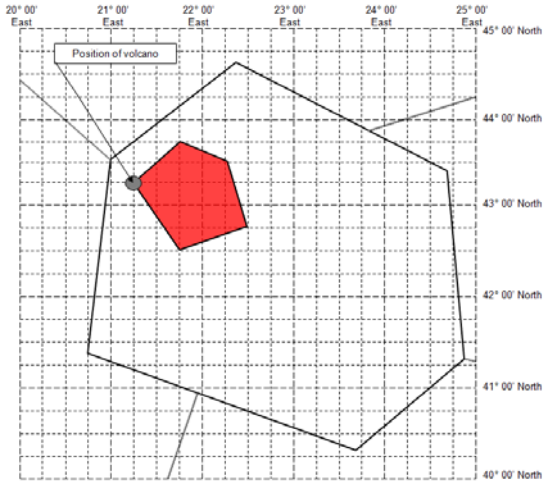


YUDD SIGMET 2 VALID 101200/101600 YUSO –

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.

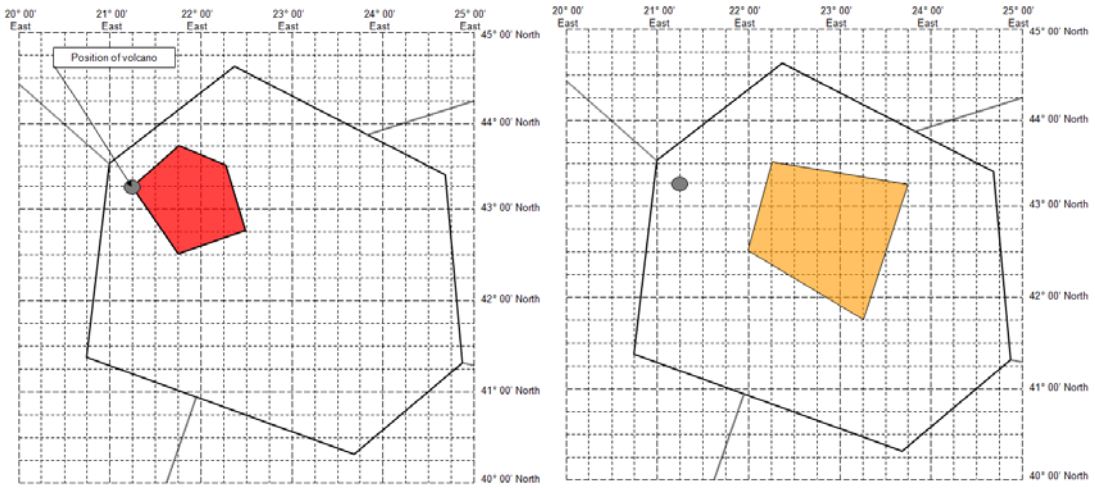


YUDD SIGMET 2 VALID 101200/101600 YUSO–

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

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

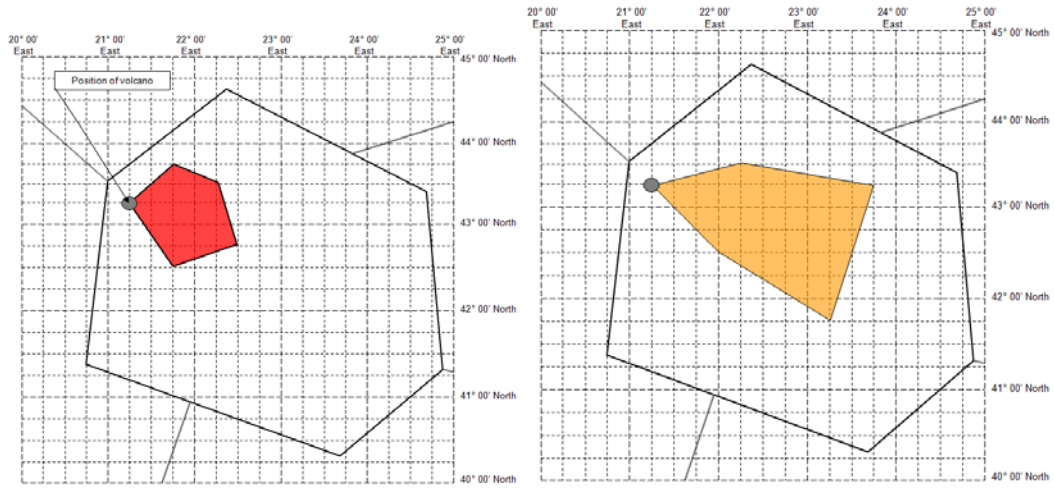


YUDD SIGMET 2 VALID 101200/101800 YUSO–

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=

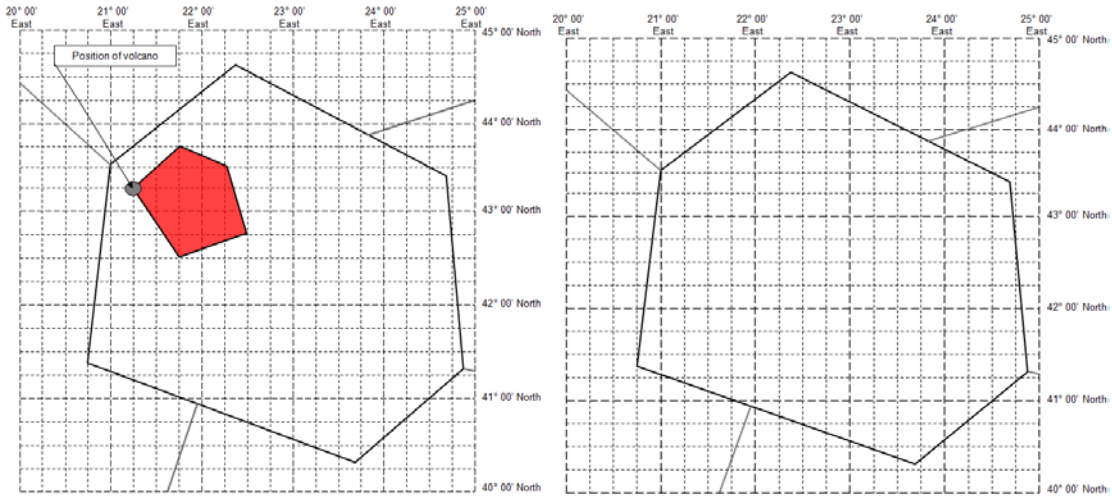
For VA (eruption on-going):



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):



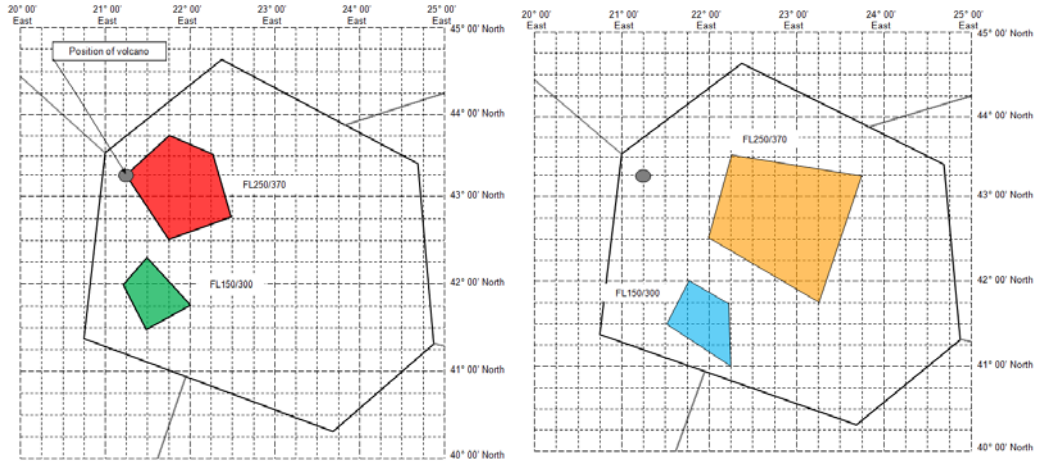
YUDD SIGMET 2 VALID 101200/101800 YUSO–

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=

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.



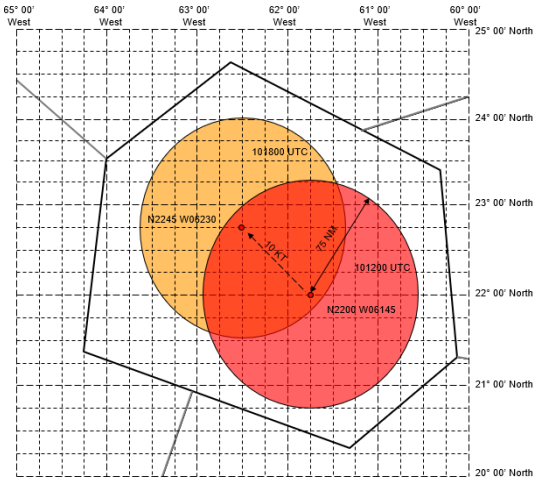
YUDD SIGMET 2 VALID 101200/101800 YUSO –

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 OBS AT 1200Z 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 examples illustrating use of "WI nnnKM (or nnnNM) OF TC CENTRE " in Tropical Cyclone SIGMET only[14]



The two following SIGMET forms are possible:

```
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 10KT WKN=
Or
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 N2245 W06230=
```

Important remark: To be compliant with Annex 3, CB will be only mentioned as an observed phenomenon by using the mention "OBS AT".

[14] Provisional guidance, pending approval by the EASPG and reflection in the eANP.

9) Additional examples of SIGMETs relating to 'concave' or 'horseshoe' shaped FIRs.

A) Considering a concave "horseshoe" shaped FIR partly surrounding another FIR with "legs" of a similar size.

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.

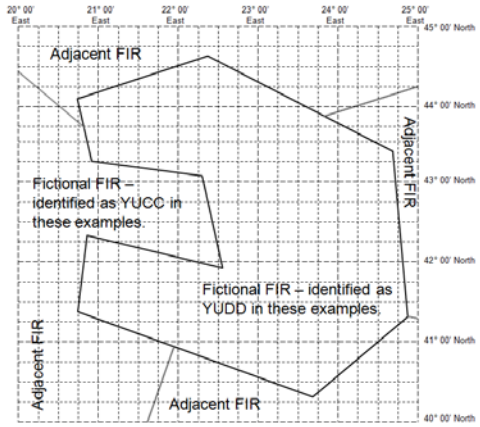
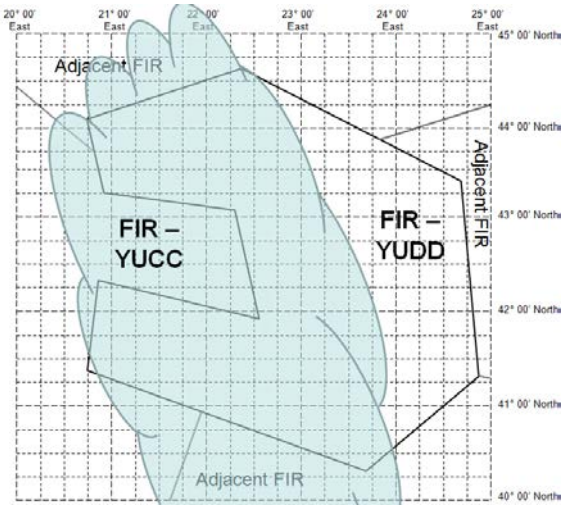


Figure 1: Fictional example of a complex 'concave' FIR – YUDD, partially surrounding FIR - YUCC[15]

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).



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

Figure 2: Fictional example of a complex 'concave' FIR – YUDD partially surrounding FIR – YUCC when both are affected by a meteorological hazard[BK109]

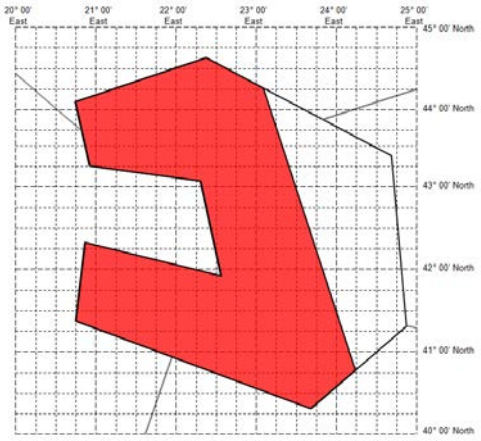
With due regard to removing any possible ambiguity, and also with regard to consistency with protocols for IWXXM versions of SIGMET, the following best practice for the EUR region is provided.

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 a FIR that partially surrounds another FIR.

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

Example 1)

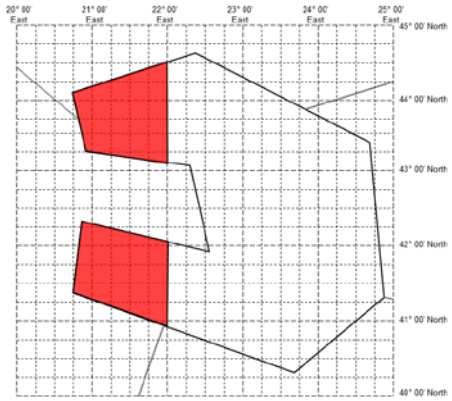
In this example, it is considered that the situation below could be encoded as a single, simple SIGMET. Users would be expected to interpret the SIGMET as indicating the area identified in red was affected by the hazard within the YUDD FIR.




```
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:

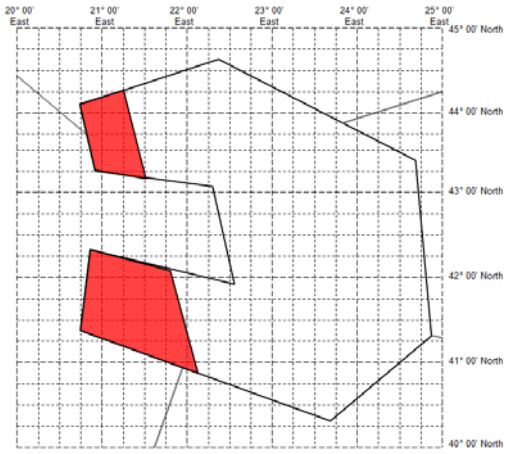
One SIGMET (northern extent of the 'horseshoe' shape)

```
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 extent 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, the same approach as in the example above should be applied ~~a similar process should be followed~~.



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

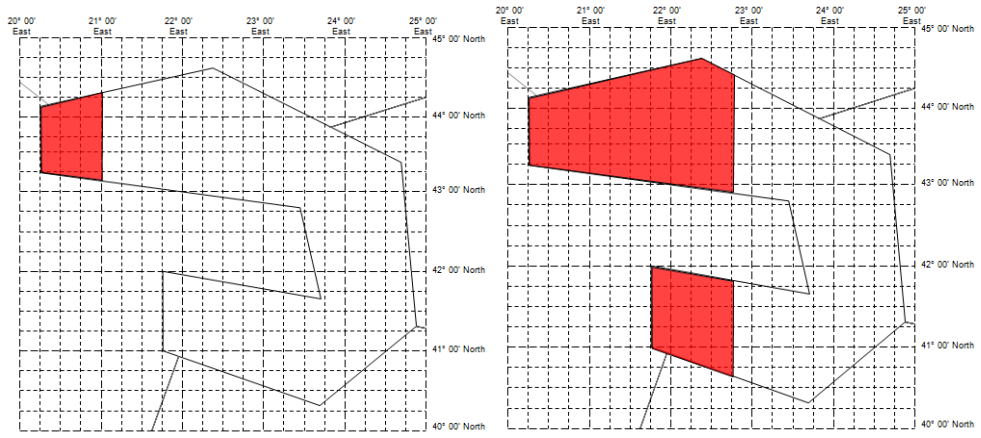
```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST SW OF LINE N4415 E02115 – N4312 E02130
FL250/370 MOV W 15KT WKN=
```

AND a second SIGMET (southern extent 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=
```

B) 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 forecast ~~validity period~~period of validity, as in 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 AT 1600Z W OF LINE N4427 E02245 – N4252 E02245=

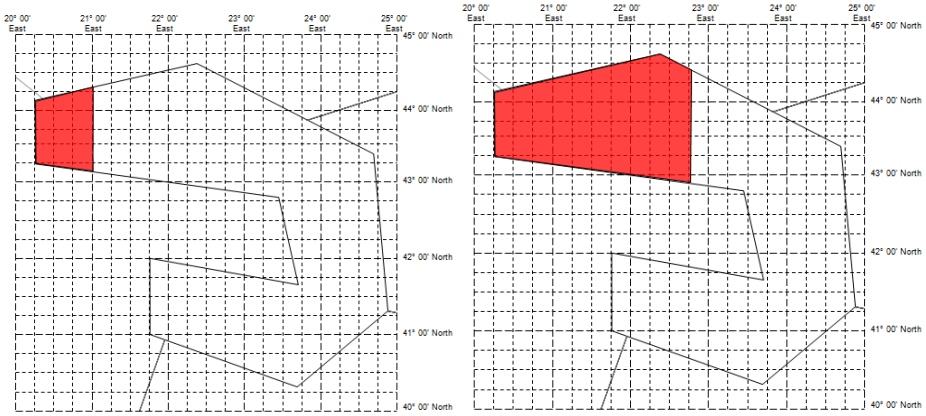
And

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 AT 1600Z W OF LINE N4147 E02245 – N4038 E02245=

Note: ~~,~~ the validity time (highlighted in bold) of the second SIGMET commences sometime after that of the first since the southern extent 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,

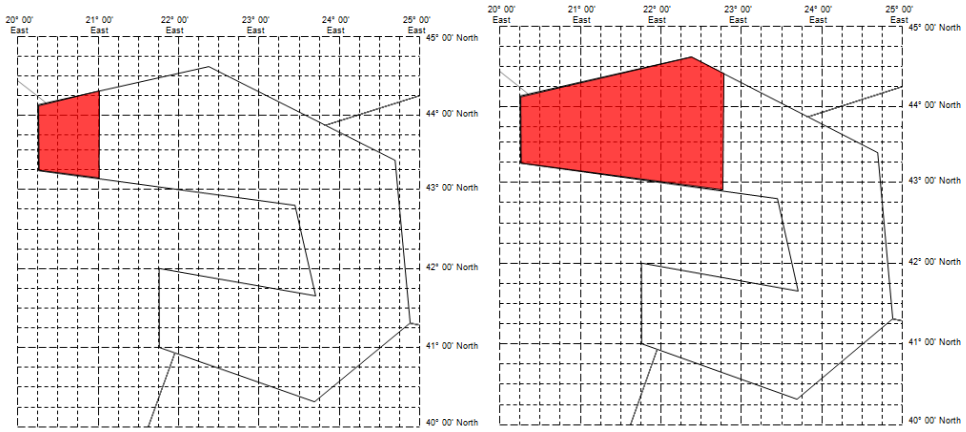


~~T~~then only a single SIGMET could be issued.

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~~ preferred 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 WKN FCST AT 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.

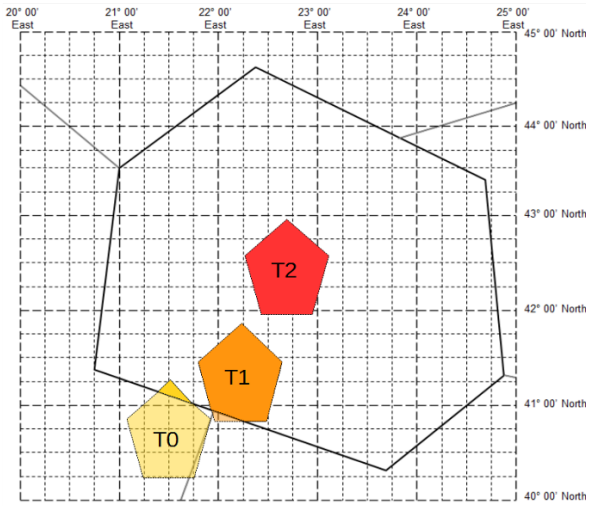
10) Additional examples for using FCST AT (VA CLOUD SIGMET)

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

In this example, a SIGMET is issued for a phenomenon ~~born~~ developing outside the FIR boundaries then moving and reaching the border of the FIR at time T0 (H0H0M0M0). Logically, the ~~validity period~~period of validity 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 only impacted from this moment on (see Figure hereinafter).

The impacted area at th~~re~~~~is~~ starting time T0 can be ~~not relevant~~too irrelevant to be described in the ***location*** of the phenomenon as only a small part of the FIR is impacted by the hazard, in the worst case, only a single point. A possibility ~~is then given by the mention~~would be to use FCST AT to describe the area covered by the phenomenon at a later time T1 (H1H1M1M1) when a significant part ~~is~~ would already be 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 directly 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 1300Z** WI “POLYGON1” FL250/370 NC **FCST AT 1800Z WI** “POLYGON2” =

Note: The time delay between T0 (start of ~~validity period~~period of validity) 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 hazard without being precise~~giving precisions~~ about it, which ~~would~~ could be confusing.

~~Thus~~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 1300Z WI [POLYGON1] FL250/370 NC FCST AT 1800Z WI [POLYGON2]=

b) YUDD SIGMET 1 VALID 101200/101800 YUSO –

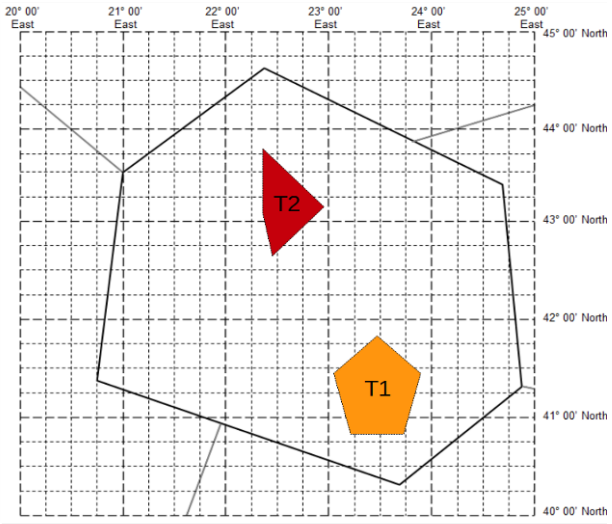
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD FCST AT 1300Z WI [POLYGON1] FL250/370 MOV NE 10KT NC=

Case a) is more informative than case b).

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

For any SIGMET, the aim is to make ~~explicit~~ the time of validity T1 of the polygon explicit 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.



~~Thus~~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=

Formation a) is more recommended as further information on the future position of the VA cloud is provided.

11) Examples using TEST and EXER indicators.

The principles of using the TEST and EXER indicators are straightforward.

The fundamental and overriding principle is that SIGMETs ~~bulletins~~ marked as TEST or EXER ~~through the use of these indicators~~ MUST NOT be used for operational decision making.

When using TEST, depending on the circumstances, the SIGMET may be truncated immediately after the TEST indicator, and this approach may be useful when simply testing routing of messages.

~~Alternatively,~~Alternatively, and again depending on the circumstances, fictional but realistic data may be included.

With regard to EXER, it is expected that the SIGMET will contain fictional but realistic ~~although not valid~~ data. ~~-~~This will permit exercises at national or regional level to be undertaken.

In all instances, by including the TEST or EXER indicators at a specified point in the SIGMET message, users and systems can immediately identify if the message should be used for operational decision making.

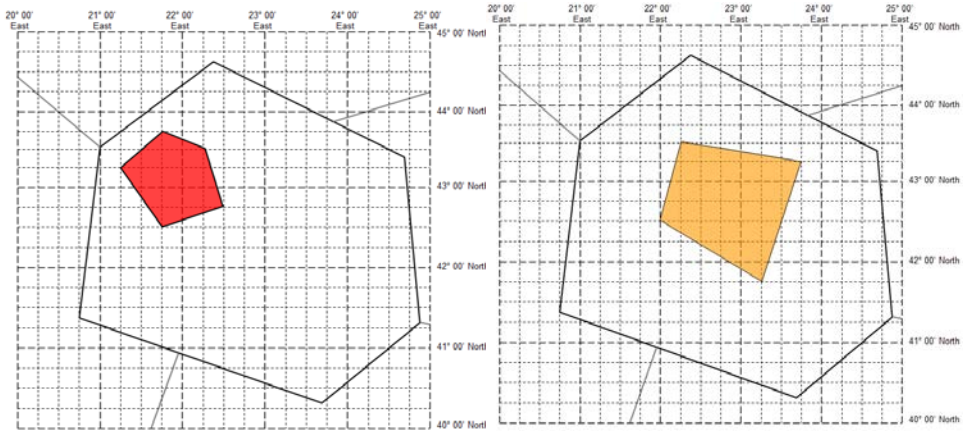
THIS DOES NOT REMOVE THE REQUIREMENT FOR ALL STAKEHOLDERS TO APPLY APPROPRIATE RIGOUR AND QUALITY CONTROL WITH REGARD TO CORRECT IDENTIFICATION AT ORIGINATION AND CORRECT USE ON RECEIPT/PROCESSING

TEST SIGMET message, with minimum content:

The example below may be used for ad hoc testing of routing, or for regional SIGMET routing tests.

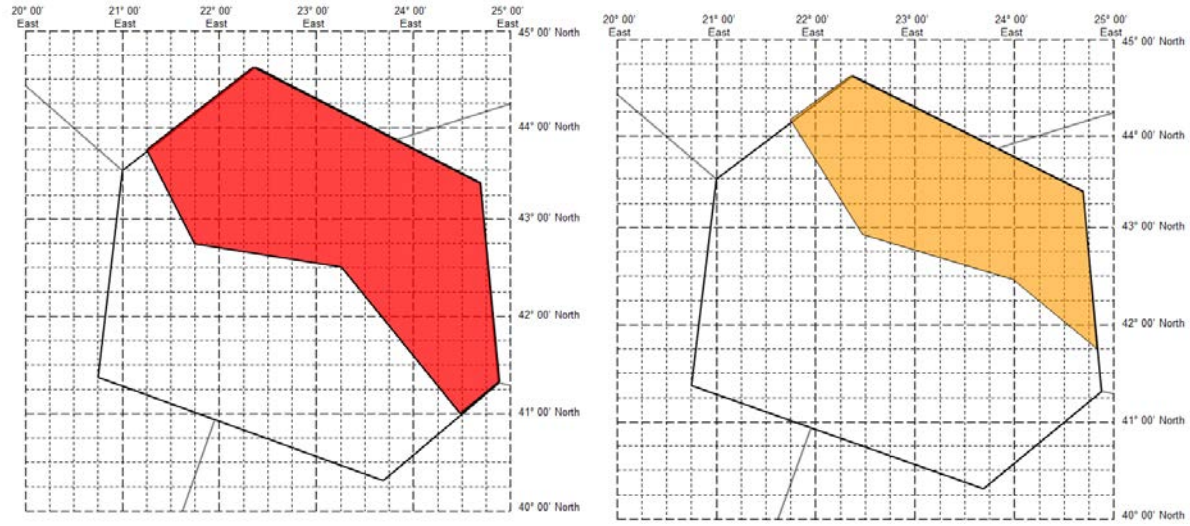
```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR TEST =
```

TEST SIGMET message, with realistic (though not necessarily valid) content:




```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR TEST 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=
```

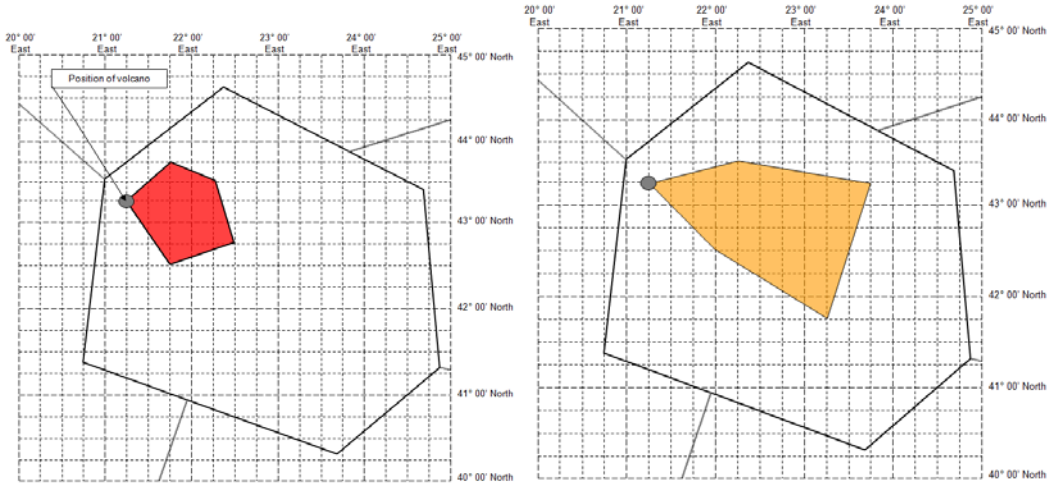
EXER SIGMET message, with realistic content:



YUDD SIGMET 2 VALID 101200/101600 YUSO–

YUDD SHANLON FIR EXER SEV TURB FCST NE OF LINE N4345 E02115 – N4245 E02145 - N4230 E02315 – N4100 E02430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4411 E02145 – N4255 E02228 - N4228 E02400 – N4130 E02450=

The most common, organised EXER – especially at regional level – is likely to be related to volcanic ash. On such occasions, 'historical' data is used in order to practice procedures over specific areas.



YUDD SIGMET 2 VALID 101200/101800 YUSO –

YUDD SHANLON FIR EXER 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 N4315 E02115 - N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 – N4315 E02115=

12) Example for radioactive cloud SIGMETs

Due to the difficulties in forecasting the dimensions of an area affected by radioactive cloud, the Inter-Agency Committee on Radiological and Nuclear Emergencies SIGMET Task Group of the International Atomic Energy Agency (IAEA) have advised the following:

- that a radius of up to 30km (or 16 nautical miles) from the source is applied and,
- a vertical extent from the surface to the upper limit of the FIR/UIR or control area (CTA) is to be applied.

After 5 November 2020, this is applied even if detailed information on the release is available.

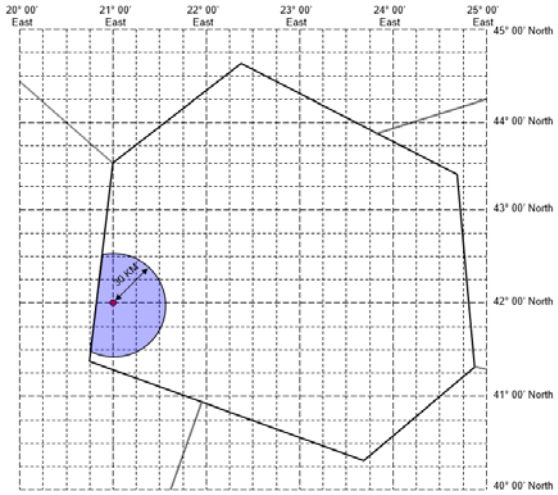
If the radioactive release site is close to the FIR boundary, then the SIGMET may be displayed as shown in the figure below. The neighbouring FIR will need to issue a SIGMET for the remaining portion of the circle.

Symbolically, this is indicated as:

WI <nnKM> OF <Nnn[nn]>or<Snn[nn]> <Wnnn[nn]>or<Ennn[nn]>

or

WI <nnNM> OF <Nnn[nn]>or<Snn[nn]> <Wnnn[nn]>or<Ennn[nn]>




```
YUDD SIGMET 3 VALID 101200/101800 YUSO –
YUDD SHANLON FIR RDOACT CLD OBS AT 1150Z WI 30KM OF N4200 E02100
SFC/FL450 STNR NC=

YAAA SIGMET 4 VALID 101200/101800 YPDM -
YAAA SHANLAT FIR RDOACT CLD OBS AT 1150Z WI 30KM OF N4200 E02100
SFC/FL450 STNR NC=
```

Appendix D - Guidance on Special air-reports

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 --> EUR Documents --> MET Guidance -->Headers – Special air-reports).

Example - Special air-report on volcanic ash

- **pilot to ACC Petropovlovsk-Kamchatsky**

o 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**‘

- **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*[BK110]*/AMHS*[ME111]*). The following is an example of providing a special air-report from the ACC to the MWO via AFTN*[BK112]*/AMHS*[ME113]*.*

o 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.

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

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

o 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 information given by the ACC.

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

o 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**

o 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 Paris (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.*

o 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.

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

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

o 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 FL310/350=**

o 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 E - 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~~ the LoA should be signed by the representatives of the respective 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 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.	** 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.*
2. AREAS of RESPONSIBILITY The lateral and vertical limits of the Areas of Responsibility (FIR/UIR) of the [MWO[1]] and [MWO[2]] are provided in Appendix.	*Reference should be made to the appropriate State AIPs.*
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 When necessary, the respective chiefs of the MWOs may introduce	** - figure to be agreed upon locally*

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~~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 required.	***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 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 F - 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_METet_Provider and State_Y_MetMET_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_MetMET_Provider meteorologist responsible for State_X Meteorological Watch Office (MWO) and State_Y_MetMET_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.
1. 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~~MET_Provider on System to aid discussion. ~~–~~Current issued SIGMETs can be visualised graphically by the State_Y_~~Met~~MET_Provider on System to aid discussion.
- In the event of any disagreement, each MWO will retain the right to 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 of State_X and State_Y FIR(s):

Include appropriate map.[BK114]

Appendix G - Example form to use to log SIGMET coordination – bilateral phone call statistics

The form 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)				