



Volcanic Ash SIGMET

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Contents

This presentation covers the following areas

- ICAO provisions related to VA SIGMET
- Composition of a VA SIGMET
- Sample VA SIGMET from VOLCEUR08
- General observations
- Further reading

ICAO provisions related to VA SIGMET



ICAO Standards and Recommended Practices (SARPs)

- ***Annex 3 - Meteorological Service for International Air Navigation***

- Chapter 7
 - SIGMET and AIRMET information, aerodrome warnings and wind shear warnings
- Appendix 6
 - Technical specifications related to SIGMET and AIRMET information, aerodrome warnings and wind shear warnings and alerts

ICAO Annex 3 SARPs

- Chapter 7 outlines that:
 - VA SIGMET shall be valid for not more than 6 hours. [Standard]
 - VA SIGMET should be based on advisory information provided by VAACs designated by regional air navigation agreement. [*Recommendation*]
 - In the case of the EUR region, VAAC London and VAAC Toulouse
 - VA SIGMET shall be issued as soon as practicable but not more than 12 hours before the commencement of the period of validity. [Standard]
 - VA SIGMET messages shall be updated at least every 6 hours. [Standard]



ICAO Annex 3 SARPs

- Appendix 6 outlines that:
 - SIGMET messages shall be disseminated to meteorological watch offices, WAFCs and to other meteorological offices in accordance with regional air navigation agreement. [Standard]
 - VA SIGMET messages shall also be disseminated to VAACs. [Standard]
 - The content and order of elements in a SIGMET message shall be in accordance with the template shown in Table A6-1. [Standard]
 - SIGMET information shall not contain unnecessary descriptive material. [Standard]

ICAO Annex 3 Table A6-1 (extract)

Annex 3 — Meteorological Service for International Air Navigation

Appendix 6

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

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

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

Element as specified in Chapter 5 and Appendix 6	Detailed content	Template(s)			Examples
		SIGMET	AIRMET	SPECIAL AIR-REPORT ¹	
Location indicator of FIR/CTA (M) ²	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET/AIRMET refers (M)	nnnn		—	YUCC ³ YUDD ³
Identification (M)	Message identification and sequence number (M)	SIGMET [nn]n	AIRMET [nn]n	ARS	SIGMET 5 SIGMET A3 AIRMET 2 ARS
Validity period (M)	Day-time groups indicating the period of validity in UTC (M)	VALID nnnnnn/nnnnnn		— ⁵	VALID 221215/221600 VALID 101520/101800 VALID 251600/252200
Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen (M)	nnnn—			YUDO— ³ YUSO— ³
Name of the FIR/CTA or aircraft	Location indicator and name of the FIR/CTA ⁶	nnnn nnnnnnnnn FIR/[UIR] or nnnn nnnnnnnnn CTA	nnnn nnnnnnnnn FIR/[n]	nnnnnn	YUCC AMSWELL FIR ³ YUDD SHANLON





ICAO EUR SIGMET guide

- **ICAO EUR Document No. 014**
 - EUR SIGMET Guide, 3rd edition, September 2007
 - Intended mainly to assist MET Watch Offices (MWO) in the EUR region in preparing and disseminating SIGMET information, including VA SIGMET
 - Access via:
http://www.paris.icao.int/documents_open/categories.php



ICAO EUR SIGMET guide

- **ICAO EUR Document No. 014**
 - **Chapter 2** – Responsibilities and coordination
 - MWO, ATS, VAAC
 - **Chapter 3** – Rules and preparation of SIGMET information
 - Type, structure and format of SIGMET
 - **Appendix A** – List of abbreviations and decode used in SIGMET
 - **Appendix B** – List of EUR SIGMET headers
 - **Appendix C** - Meteorological phenomena to be reported by SIGMET
 - **Appendix D** - Guidelines for reporting geographical coordinates in SIGMET

Composition of a VA SIGMET

Composition of a VA SIGMET

First line of SIGMET:

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

CCCC	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers
SIGMET	Message identifier
[nn]n	Daily sequence number (see paragraph 3.4.2.2)
VALID	Period of validity indicator
YYGGgg/YYGGgg	Validity period of the SIGMET given by date/time group of the beginning and date/time group of the end of the period (see paragraph 3.4.2.3)
CCCC-	ICAO location indicator of the MWO originating the message and – (hyphen, without space, to separate the preamble from the text)

Examples:

EDBB SIGMET 3 VALID 121100/121500 EDZB-

VHHK SIGMET A04 VALID 202230/210230 VHHH-

(Extracted from EUR Doc 014 Chapter 3.3)

Composition of a VA SIGMET

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

Start of the second line of the message:

1	2	3		4
Location indicator of the FIR/UIR or CTA	Name of the FIR or UIR or FIR/UIR or CTA	Phenomenon	Volcano	
			Name	Location
<CCCC>	<name> FIR [UIR, FIR/UIR, CTA]	VA	[ERUPTION] [MT <name>]	[LOC <location>]
				VA CLD OBS AT <GGggZ> VA CLD FCST

5			6
Extent of the cloud			Expected movement
Vertical	Horizontal	Position	
FL <nnn/nnn>	APRX <nnn> BY <nnn> KM	<lat,lon> - <lat,lon> - ...	MOV <direction> <speed>

7	
Volcanic ash cloud forecast at the end of the period of validity	
FCST time	Position
FCST <GGggZ>	VA CLD APRX [FL<nnn/nnn>] <lat,lon> - <lat,lon> - ...

(Extracted from EUR Doc 014 Chapter 3.3)

Composition of a VA SIGMET

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

[VA ERUPTION] [MT <name>] [LOC <lat,lon>]

or

VA CLD

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

- **Examples:**

VA ERUPTION MT KATLA LOC N6338 W01903

VA CLD



Composition of a VA SIGMET

- Time of observation or expected commencement of the VA CLD

VA CLD OBS AT <GGgg>Z

or

VA CLD FCST

- Examples:

VA CLD OBS AT 0100Z

VA CLD FCST

Composition of a VA SIGMET

- Level and extent of the volcanic ash cloud

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

or

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

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

- Examples:

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

FL150/210 S0530 E09300 – N0100 E09530 – N1215 E11045

Composition of a VA SIGMET

- Movement or expected movement of the VA cloud:

MOV <direction> <speed>

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

MOV E 35 KMH

MOV SW 20 KT

Composition of a VA SIGMET

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

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

- The **GGggZ** group should indicate the end of the validity period given in the first line of the SIGMET message.
 - The description of the expected position of the volcanic ash cloud is given by a number of points forming a simplified geometrical approximation of the cloud.
- In describing the VA cloud, **up to four different layers can be used**, indicated by flight levels in the form FL<nnn/nnn>.
 - The use of more than one level is necessary when the wind direction changes with height which causes the VA cloud to spread into different directions at different heights.



Composition of a VA SIGMET

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

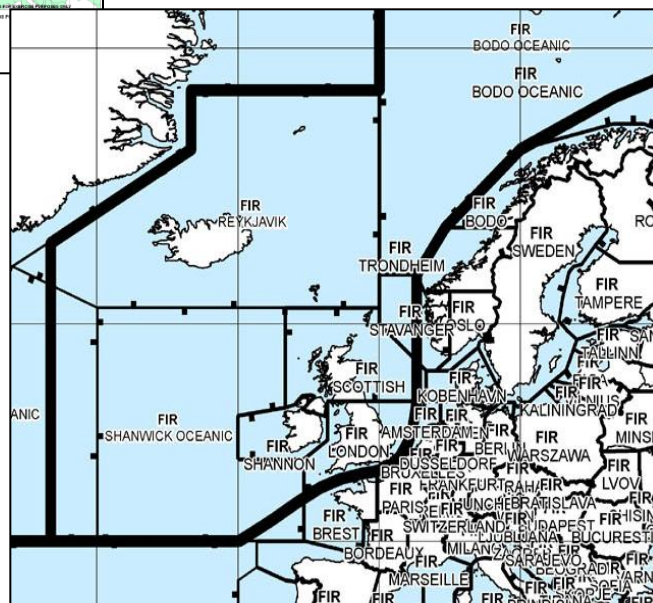
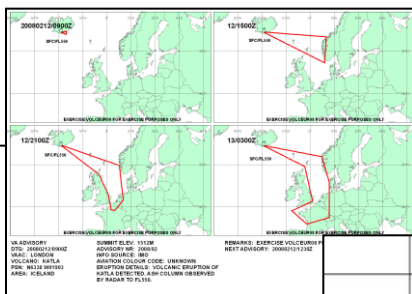


Sample VA SIGMET from VOLCEUR08

VA SIGMET issued during VOLCEUR08

VAA / VAG → MWO area of responsibility? → VA SIGMET

VA ADVISORY
DTG: 20080212/0900Z
VAAC: LONDON
VOLCANO: KATLA
PSN: N6338 W01903
AREA: ICELAND
SUMMIT ELEV: 1512M
ADVISORY NR: 2008/02
INFO SOURCE: IMO
AVIATION COLOUR CODE: UNKNOWN
ERUPTION DETAILS: VOLCANIC ERUPTION OF KATLA DETECTED. ASH COLUMN OBSERVED BY RADAR TO FL550.
OBS VA DTG: 12/0900Z
OBS VA CLD: SFC/FL550 N6338 W01903 - N6400 W01700 - N6330 W01700 - N6338 W01903
FCST VA CLD +6 HR: 12/1500Z SFC/FL550 N6338 W01903 - N6300 E00700 - N5730 E00600 - N6338 W01903
FCST VA CLD +12 HR: 12/2100Z SFC/FL550 N6338 W01903 - N6000 E00500 - N5200 E00700 - N4900 E00300 - N4930 E00130 - N5300 E00030 - N5756 W00330 - N6338 W01903
FCST VA CLD +18 HR: 13/0300Z SFC/FL550 N6338 W01903 - N6130 E00500 - N5600 E00800 - N4700 E00800 - N4500 W00100 - N4900 W00730 - N5130 E00100 - N5930 W00200 - N6338 W01903
RMK: EXERCISE VOLCEUR08 FOR EXERCISE PURPOSES ONLY
NXT ADVISORY: 20080212/1230Z=



BIRD SIGMET 03 VALID 120935/121500 BIRK-
EXERCISE VOLCEUR08
BIRD REYKJAVIK CTA VA MT KATLA LOC
N6338 W01903 VA CLD OBS AT 0900Z
SFC/FL550 N6338 W01903 - N6400 W01700 -
N6330 W01700
FCST 1500Z VA CLD APRX SFC/FL550 N6338
W01903 - N6340 W000 - N61 W000 - N61
W00440 CNL SIGMET 02 120915/121100
EXERCISE EXERCISE EXERCISE=



VA SIGMET issued during VOLCEUR08

- As the volcanic ash cloud spread East then South, then eventually South-West, responsible MWOs issued VA SIGMETs for the following impacted FIRs:

- EBBU BRUSSELS FIR
- EGPX SCOTTISH FIR
- LFBB BORDEAUX FIR/UIR
- LFFF PARIS FIR/UIR
- EGTG LONDON FIR
- LFEE REIMS FIR/UIR
- LFRR BREST FIR/UIR
- EDWW BREMEN FIR
- EDYY HANNOVER UIR
- EDGG LANGEN FIR
- EDUU RHEIN UIR
- ENOR NORWAY FIR
- EHAA AMSTERDAM FIR



Example VA SIGMET

- Based on VAA/VAG #002, Reykjavik MWO issued the following VA SIGMET for BIRD FIR, valid 120935 to 121500Z:

```
WVIL31 BICC 120934
BIRD SIGMET 03 VALID 120935/121500 BIRK-
EXERCISE VOLCEUR08
BIRD REYKJAVIK CTA VA MT KATLA LOC N6338 W01903 VA CLD OBS AT 0900Z
SFC/FL550 N6338 W01903 - N6400 W01700 - N6330 W01700
FCST 1500Z VA CLD APRX SFC/FL550 N6338 W01903 - N6340 W000 - N61 W000 -
N61 W00440 CNL SIGMET 02 120915/121100
EXERCISE EXERCISE EXERCISE=
```

- At around the same time, Brussels MWO issued a VA SIGMET for their area of responsibility (EBBU FIR) valid 122100 to 130300Z:

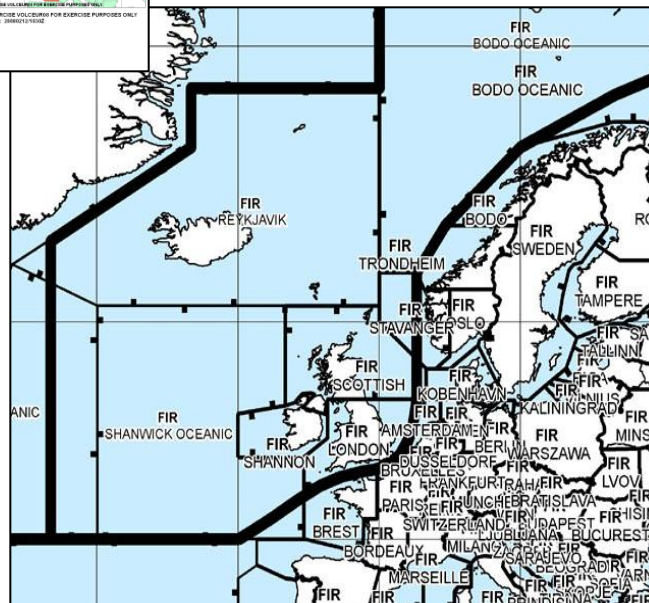
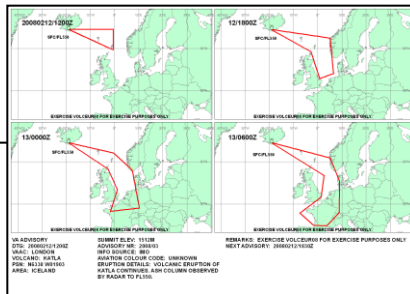
```
WVBX31 EBBR 120938
EBBU SIGMET 1 VALID 122100/130300 EBBR-
EBBU BRUSSELS FIR EXERCISE VOLCEUR08VA ERUPTION MT KATLA LOC N6338
W01903 VA CLD FCST SFC/FL550 N5150 E0200 N5150 E0480 N5120 E0580 N5080
E0610 N4970 E0500 N5000 E0420 N5110E0200 N5150 E0200 MOV SE
FCST 0300Z VA CLD SFC/FL550 WHOLE BRUSSELS FIR
OTLK 130900 NIL
EXERCISE - EXERCISE ==
```

- Remember, VA SIGMET can be issued up to 12 hours before the commencement of the period of validity.

New VAA information issued at 1200Z

VAA / VAG → **MWO area of responsibility?** → **VA SIGMET**

VA ADVISORY
DTG: 20080212/1200Z
VAAC: LONDON
VOLCANO: KATLA
PSN: N6338 W01903
AREA: ICELAND
SUMMIT ELEV: 1512M
ADVISORY NR: 2008/03
INFO SOURCE: IMO
AVIATION COLOUR CODE: UNKNOWN
ERUPTION DETAILS: VOLCANIC ERUPTION OF KATLA CONTINUES. VA COLUMN OBSERVED BY RADAR TO FL550.
OBS VA DTG: 12/1200Z
OBS VA CLD: SFC/FL550 N6338 W01903 - N6400 W00030 - N6000 W00030 - N6338 W01903
FCST VA CLD +6 HR: 12/1800Z SFC/FL550 N6338 W01903 - N6200 E00530 - N5430 E00630 - N5300 E00100 - N5930 W00300 - N6338 W01903
FCST VA CLD +12 HR: 13/0000Z SFC/FL550 N6338 W01903 - N6130 W00030 - N5800 E00730 - N4900 E01000 - N48008 W00200 - N5330 E00100 - N5830 W00300 - N6338 W01903
FCST VA CLD +18 HR: 13/0600Z SFC/FL550 N6338 W01903 - N6030 E00500 - N5600 E00900 - N4800 E00900 - N4400 E00400 - N4400 W00130 - N4730 W00730 - N5200 E00130 - N5700 E00230 - N6338 W01903
RMK: EXERCISE VOLCEUR08 FOR EXERCISE PURPOSES ONLY
NXT ADVISORY: 20080212/1830Z=



WVIL31 BICC 121220
BIRD SIGMET 04 VALID 121220/121820 BIRK-
EXERCISE VOLCEUR08
BIRD REYKJAVIK CTA VA ERUPTION MT
KATLA LOC N6338 W01903
VA CLD OBS AT 1200Z SFC/FL550 N6338
W01903 - N6400 W00030 - N6100 W00030 -
N6100 W00430
FCST 1800Z VA CLD APRX SFC/FL550 N6338
W01903 - N6250 W00000 - N6100 W00000 -
N6100 W00730
CNL SIGMET 03 120935/121500
EXERCISE EXERCISE EXERCISE=



Example VA SIGMET

- Upon receiving new VAA/VAG guidance from VAAC London at 1200Z (VAA/VAG #003), Reykjavik MWO issued the following VA SIGMET:

```
WVIL31 BICC 121220
BIRD SIGMET 04 VALID 121220/121820 BIRK-
EXERCISE VOLCEUR08
BIRD REYKJAVIK CTA VA ERUPTION MT KATLA LOC N6338 W01903
VA CLD OBS AT 1200Z SFC/FL550 N6338 W01903 - N6400 W00030 -
N6100 W00030 - N6100 W00430
FCST 1800Z VA CLD APRX SFC/FL550 N6338 W01903 - N6250 W00000
- N6100 W00000 - N6100 W00730
CNL SIGMET 03 120935/121500
EXERCISE EXERCISE EXERCISE=
```

- Similarly, Brussels MWO issued new VA SIGMET:

```
WVBX31 EBBR 121205
EBBU SIGMET 2 VALID 130000/130600 EBBR-
EBBU BRUSSELS FIR EXERCISE VOLCEUR08 VA ERUPTION MT KATLA LOC
N6338 W01903 VA CLD FCST SFC/FL550 WHOLE BRUSSELS FIR MOV SE
FCST 0600Z VA CLD SFC/FL550 WHOLE BRUSSELS FIR
OTLK 131200 NIL
EXERCISE - EXERCISE ==
```


General observations



General observations from recent VA exercises

- Experience from recent volcanic ash contingency exercises within the NAT and EUR regions has shown that there are occasionally different approaches employed by MWOs regarding the content of VA SIGMET messages, for example:
 - Some MWOs appear to follow ICAO guidelines and standards, others less so; and
 - When VA cloud straddles two or more FIRs, the information between neighbouring FIRs is inconsistent.
- This can cause great difficulties for operators who are expected to make tactical decisions based on VA SIGMET information;
- **Remember, flight safety critical decisions are made based on VA SIGMET information.**

Differing content and format

- Why is VA SIGMET information sometimes inconsistent between neighbouring FIRs?
 - Lack of coordination/consultancy between responsible MWOs;
 - Differing VA SIGMET issue times and validity times; or
 - Lack of visibility of other centres products.
- Why do different VA SIGMET formats appear to be used?
 - Misunderstanding or misinterpretations of the ICAO provisions and guidelines; or
 - State may have 'filed a difference' against Annex 3 SARPs.



What can be done to improve the situation?

- Review and understand ICAO SARPs and guidance material, including:
 - Annex 3
 - EUR Doc 014
 - ICAO Doc 9766
- Address any differences to the State Met Authority and/or ICAO Regional Office
- Conduct local staff training to ensure forecasters are familiar with the composition of a VA SIGMET
 - Remember, VA SIGMET are issued much less frequently than other (non-VA) SIGMET.
- Consult and coordinate VA response with neighbouring MWOs
- **Participate in regional VA exercises.**

Further reading

Further reading

- The following reference documents contain information pertinent to the production and dissemination of VA SIGMET:
 - ICAO Annex 3 – Meteorological Service for International Air Navigation
 - ICAO Doc 9766 – Handbook on International Airways Volcano Watch (IAVW) Operational Procedures and Contact List
 - ICAO EUR Doc 014 – EUR SIGMET Guide
 - ICAO EUR Doc 019 – VA Contingency Plan

Questions & answers