



International Civil Aviation Organization

WORKING PAPER

**TWENTIETH MEETING OF THE METEOROLOGY SUB-GROUP
(MET SG/20) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP (APANPIRG)**

Bangkok, Thailand, 6 – 9 June 2016

Agenda Item 7: Regional guidance material

SIGMET PAMPHLET UPDATES FOR ANNEX 3 AMENDMENT 77

(Presented by MET/S WG Ad Hoc Group)

SUMMARY

This paper presents the draft other phenomena (WS), tropical cyclone (WC) and volcanic ash (WV) SIGMET pamphlets updated to align with Amendment 77 to Annex 3 – Meteorological Service for International Air Navigation.

1. INTRODUCTION

1.1. The fourth meeting of the Meteorological Hazards Task Force (MET/H TF/4), held in Beijing, China from 19-21 March 2014, formulated the agreed action 4/12 as follows:

'Ad-hoc group consisting of Australia, Hong Kong China and New Zealand (Rapporteur) to review and update the SIGMET posters to realign with Amendment 77 to Annex 3 in 2016'.

1.2. Further to this, the fifth meeting of the Meteorological Hazards Task Force (MET/H TF/5), held in Seoul, Republic of Korea from 18-20 March 2015, formulated the following Decision:

MET/H TF/5 Decision 5/1 – Regional guidance material: SIGMET pamphlets

That, in order to enhance the guidance available to States for the production of SIGMET:

a) The draft pamphlets presented in MET/H TF/5 WP/4, intended as a quick reference guide for the preparation of [WC and WS] SIGMET, be further developed and a new draft pamphlet be developed for [WV] SIGMET and promulgated through the MET SG to APANPIRG, ICAO HQ and WMO for final review and further action;

b) Arrangements be proposed for the appropriate publication/distribution of the (approved) SIGMET pamphlets in electronic form; and

c) *Future revisions are to be developed to realign all the SIGMET pamphlets with Amendment 77 to ICAO Annex 3 for final review and approval in time for applicability in November 2016.*

1.3. The nineteenth meeting of the Meteorological Sub Group (MET/SG/19), held in Bangkok, Thailand from 3-6 August 2015, was also presented with a draft of the WS and WC SIGMET pamphlets and subsequently formulated the following draft conclusion for APANPIRG and Decision for the METSG:

METSG/19 Decision 19/19 — SIGMET Pamphlets

That, the ad-hoc group, consisting of Australia, New Zealand, Japan and Hong Kong China:

- a) *Forward the final versions of the WS and WC SIGMET pamphlets to ICAO for publication on the APAC eDocuments website*, if approved by APANPIRG;*
- b) *Further develop the WV SIGMET pamphlet; and*
- c) *Review the pamphlets again in July 2016 when Amendment 77 to Annex 3 is published to ensure that the pamphlets are aligned accordingly with Amendment 77 prior to its effective date in November 2016.*

2. DISCUSSION

2.1. The ad-hoc group, consisting of Australia, Japan, Hong Kong China and New Zealand (Rapporteur), have the following task on the Meteorological Services Working Group (MET/S WG) Work Plan:

Task 2.1 Review SIGMET pamphlets with regard to Annex 3 Amendment 77.

2.2. The ad-hoc group has progressed work on drafts of the WS, WC and WV SIGMET pamphlets to align with Amendment 77 to Annex 3 – Meteorological Services for International Air Navigation which will become applicable on 10 November 2016.

2.3. These drafts are provided in Attachments A, B and C to this paper.

3. RECOMMENDATION

3.1. It is recommended that the MET SG/20 adopt the following Decision:

Decision 20/x – SIGMET Pamphlet updates for Annex 3 Amd 77

That ICAO be invited to adopt the updated SIGMET pamphlets as regional guidance material, distribute these to States prior to November 2016 and make them available on the ICAO APAC website.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

- a) Note the information contained in this working paper; and
- b) Provide any comments and feedback on the proposed changes to e.heba@bom.gov.au no later than the 30th June;
- c) Adopt the Decision in paragraph 3.1.

SIGMET QUICK REFERENCE GUIDE

WS SIGMET

AMD 77
DRAFT 1

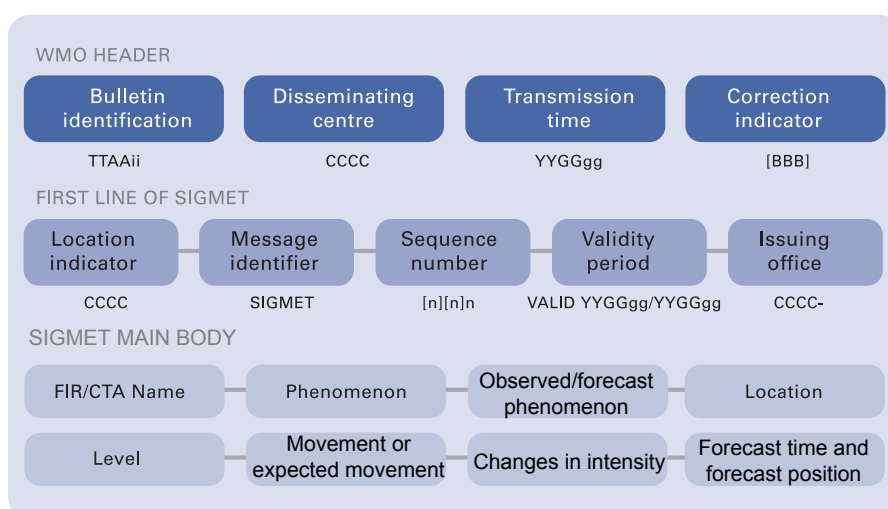
SIGMET Abbreviations

ABV	Above
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WS SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WS SIGMET provides information on phenomena other than tropical cyclones and volcanic ash.

SIGMET Structure



WMO Header

Bulletin identification

TT	Data type designator	WS – for SIGMET for phenomena other than volcanic ash cloud and tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)

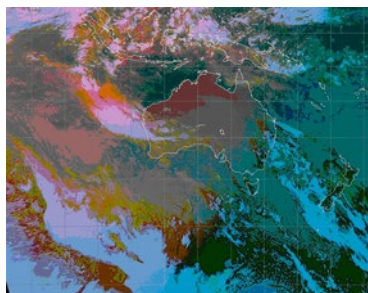
Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).





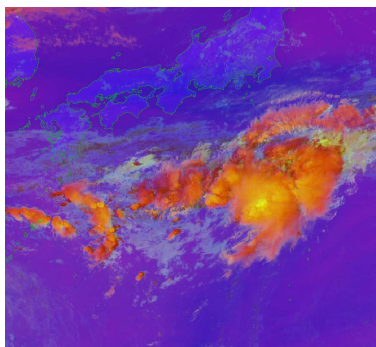
MTSAT-1R icing enhancement. Dark areas indicate the presence of supercooled liquid water (black by night, red by day). High level cirrus (bright areas) may prevent the satellite from seeing the lower level clouds.



Anvil of a cumulonimbus cloud



Duststorm, Sydney, 23 September 2009. Image courtesy of Elly Spark, Bureau of Meteorology.



Day Convective Storm RGB, Himawari-8. This RGB composite image is used for CB detection. Red and yellow colored clouds are possible CB clouds (deep precipitating clouds)

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. The period of validity for a WS SIGMET shall be no more than 4 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

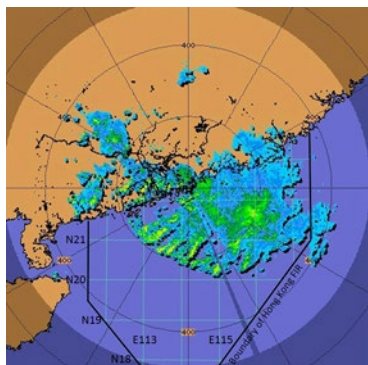
SIGMET Main Body

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR/[UIR] or CCCC <name> CTA**.

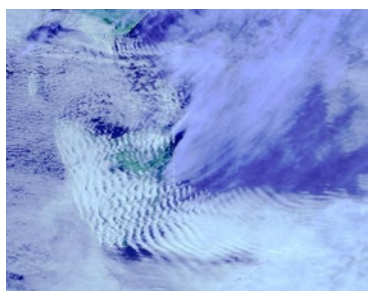
Phenomenon

Code	Description
OBSC TS	Obscured thunderstorms
EMBDTS	Embedded thunderstorms
FRQTS	Frequent thunderstorms
SQLTS	Squall line thunderstorms
OBSC TSGR	Obscured thunderstorms with hail
EMBD TSGR	Embedded thunderstorms with hail
FRQ TSGR	Frequent thunderstorms with hail
SQL TSGR	Squall line thunderstorms with hail
SEVTURB	Severe turbulence
SEV ICE	Severe icing
SEV ICE (FZRA)	Severe icing due to freezing rain
SEV MTW	Severe mountain wave
HVY DS	Heavy duststorm
HVY SS	Heavy sandstorm
RDOACT CLD	Radioactive cloud



Widespread thunderstorms affecting the Southern China and the northern part of South China Sea on 9 May 2014.

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west



Satellite image of mountain waves over Tasmania, 3 December 2002.

Observed or forecast phenomenon

Whether the phenomenon is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the phenomenon is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes. The number of coordinates should be kept to a minimum and should not normally exceed seven.

Level

The level and vertical extent of the phenomenon:

FLnnn or **nnnnM** or **nnnnFT** or **SFC/FLnnn** or **SFC/nnnnM** or **SFC/nnnnFT** or **FLnnn/nnn** or **nnnn/nnnnFT** or **TOP FLnnn** or **ABV FLnnn** or **TOP ABV FLnnn**.

Movement or expected movement (not included if "forecast time" and "forecast position" are given)

Direction and rate of movement of the phenomenon where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Changes in intensity

The expected evolution of the phenomenon's intensity as indicated by:

INTSF or **WKN** or **NC**

Forecast time and forecast position (not included if movement is given)

The forecast position of the hazardous phenomena at the end of the validity period of the SIGMET message in the form **FCST AT <GGgg>Z <location>**.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the phenomenon is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the phenomenon for which the SIGMET was issued is no longer occurring or is no longer expected, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL.

CNL SIGMET [n][n]n YYGGgg/YYGGgg

Source of Information

Source of Information	Phenomena
Surface and upper-air observations Special AIREP Satellite pictures NWP forecasts	Thunderstorms, dust/sandstorms, turbulence, mountain waves, icing
RADAR Lightning information	Thunderstorms
WMO RSMC (Atmospheric transport modelling for environmental emergency)	Radioactive cloud

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

WS SIGMET Examples

Format

WSAAii CCCCYYGGgg [BBB]
 CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-CCCC
 <FIR/CTA Name> FIR <Phenomenon> OBS/FCST [AT GGggZ]
 <Location> <Level> <Movement> <Intensity changes>
 <Forecast time and forecast position>=

Thunderstorms

WSSS20 VHHH 090900
 VHHK SIGMET 3 VALID 090900/091300 VHHH-
 VHHK HONG KONG FIR EMBD TS OBS AT 0900Z N OF
 N2000 AND E OF E11330 TOP FL400 INTSF FCST AT
 1300Z N OF N2000 AND E OF E11300=

Duststorms

WSAU21 ADRM 240330
 YMMM SIGMET D01 VALID 240330/240430 YPDM-
 YMMM MELBOURNE FIR HVY DS OBS WI S2300
 E13415 – S2240 E13800 – S2520 E13800 – S2525
 E13520 – S2300 E13415 SFC/7000FT MOV N 25KT NC=

Sandstorms

WSCI33 ZBAA 301110
 ZBPE SIGMET 2 VALID 301110/301510 ZBAA-
 ZBPE BEIJING FIR HVY SS OBS AT 1100Z N OF N40
 SFC/2000M MOV E 30KMH NC=

Turbulence

WSNZ21 NZKL 232134
 NZCC SIGMET 18 VALID 232134/240134 NZKL-
 NZCC NEW ZEALAND FIR SEV TURB FCST WI S3929
 E17602 – S4305 E17136 – S4522 E17000 – S4538
 E17159 – S4112 E17624 – S3929 E17602 FL180/260 MOV
 E 25KT INTSF=

Mountain waves

WSAU21 AMRF 061700
 YMMM SIGMET M07 VALID 061700/062100 YMRF-
 YMMM MELBOURNE FIR SEV MTW OBS WI S3704 E14244
 – S3611 E14753 – S3736 E14943 – S4006 E14800 – S3952
 E14353 – S3704 E14244 FL080/140 STNR NC=

Icing

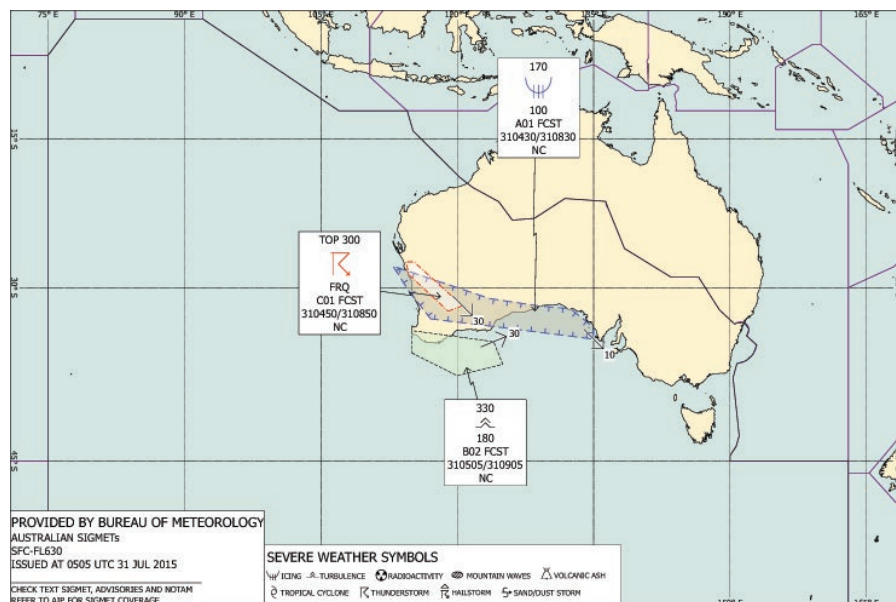
WSCI45 ZHHH 021100
 ZHWH SIGMET 3 VALID 021100/021500 ZHHH-
 ZHWH WUHAN FIR SEV ICE FCST N OF N28 SFC/FL200
 STNR NC=

Radioactive cloud

WSSS20 VHHH 180830
 VHHK SIGMET 1 VALID 180830/181230 VHHH-
 VHHK HONG KONG FIR RDOACT CLD FCST E OF E114
 SFC/FL100 MOV E 20KT WKN=

Cancellation

WSSS20 VHHH 181100
 VHHK SIGMET 2 VALID 181100/181230 VHHH-
 VHHK HONG KONG FIR CNL SIGMET 1 180830/181230=



Graphical SIGMET display.

Refer to the following for more information

- ICAO Annex 3 – Meteorological Service for International Air Navigation (Amd 77)
- ICAO Regional SIGMET Guide
- ICAO Doc.8896 – Manual of Aeronautical Meteorological Practice
- WMO No.49 Technical Regulations Volume II – Meteorological Service for International Air Navigation (2013 ed)
- WMO No.732 Guide to Practices for Meteorological Offices Serving Aviation

SIGMET QUICK REFERENCE GUIDE

WC SIGMET

AMD 77
DRAFT 1

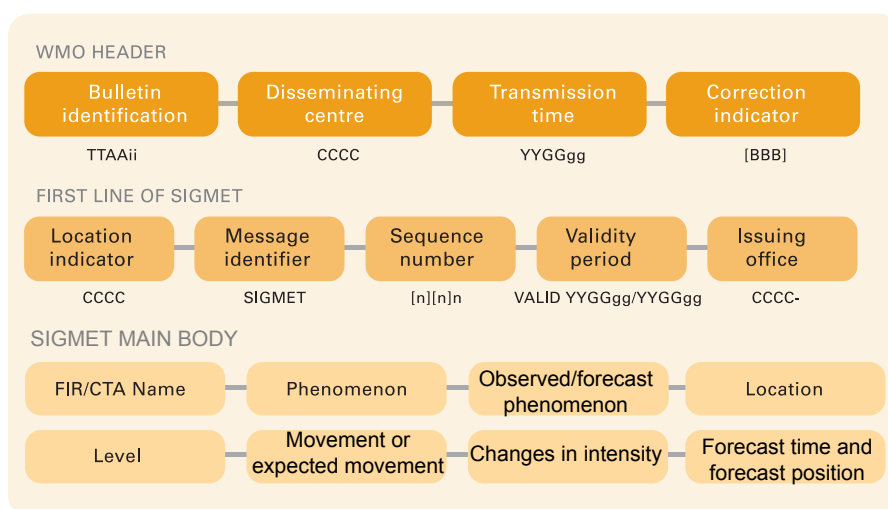
SIGMET Abbreviations

ABV	Above
BLW	Below
CB	Cumulonimbus cloud
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
PSN	Position
SFC	Surface
STNR	Stationary
TC	Tropical Cyclone
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WC SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WC SIGMET provides information on tropical cyclones (intensity 34 knots or greater). WC SIGMET should be based on the Tropical Cyclone Advisory.

SIGMET Structure



WMO Header

Bulletin identification

TT	Data type designator	WC – for SIGMET for tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)

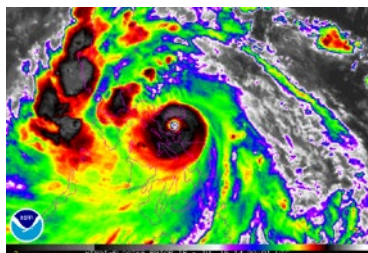
Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).

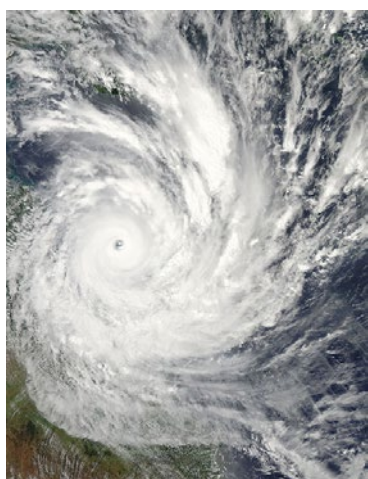




Typhoon Rammasun landfall in the Philippines on 15 July 2014. Image courtesy NOAA Satellite Services Division.



Damage from Supertyphoon Pongsona on the island of Rota, 20 December 2002. Image courtesy FEMA Photo Library, Andrea Booher.



Satellite image of Severe Tropical Cyclone Yasi approaching Queensland, Australia on 2 February 2011. Image courtesy NASA; MODIS.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. For an observed TC, the start of validity for the SIGMET should be the same as the issue time. For a forecast TC, the start of validity should be the time the TC is expected to enter/develop in a MWO's FIR and can be issued no more than 12 hours prior to the start of validity. The validity period for a WC SIGMET shall be no more than 6 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

SIGMET Main Body

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR]** or **CCCC <name> CTA**.

Phenomenon

The description of the tropical cyclone consists of the abbreviation TC, the international name given by the corresponding WMO RSMC in the form **TC <name>** and the TC centre position **at the time specified under element "Observed or forecast phenomenon"** in the form **PSN <N(S)nn[nn] E(W)nn[nn]>**, where latitude and longitude is given in degrees and minutes. If the disturbance is expected to become a TC, but is not yet named, the term **TC NN** should be used.

Observed or forecast phenomenon

Whether the tropical cyclone **at position given in "Phenomenon"** is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the CB associated with the tropical cyclone is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The vertical and horizontal extent of the CB associated with the tropical cyclone in the form:

TOP [ABV or BLW] <FLnnn>

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west



Typhoon Jelawat on 9 August 2000, showing clear Annular characteristics. Image courtesy NASA.

Movement or expected movement (not included if "forecast time" and "forecast position" are given)

Direction and rate of movement of the tropical cyclone where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Changes in intensity

The expected evolution of the tropical cyclone's intensity as indicated by: **INTSF** or **WKN** or **NC**

Forecast time and forecast position (not included if movement is given)

The forecast time and forecast position of the tropical cyclone in the form: **FCST AT <GGgg>ZTC CENTRE PSN <location>**

Repetition of elements

This is used to repeat the elements in a SIGMET message when two tropical cyclones occur simultaneously in an FIR. The descriptor **AND** is used to separate the elements for each tropical cyclone.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the tropical cyclone is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the tropical cyclone intensity falls below 34 knots or if it has moved out of the FIR, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation **CNL** in lieu of meteorological information.

CNL SIGMET [n][n]n YYGGgg/YYGGgg

When cancelling a WC SIGMET consider the need for a WS SIGMET for thunderstorms.

Source of Information

Source of Information	Types of Information	Issue a WC SIGMET
MWO, TCAC	Observations that confirm a tropical cyclone has developed. Information concerning a tropical cyclone is received from a TCAC.	TC observed – issue immediately. TC forecast to enter/develop in MWOs FIR – issue up to 12 hours before the time the TC is expected to enter/develop in FIR.

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

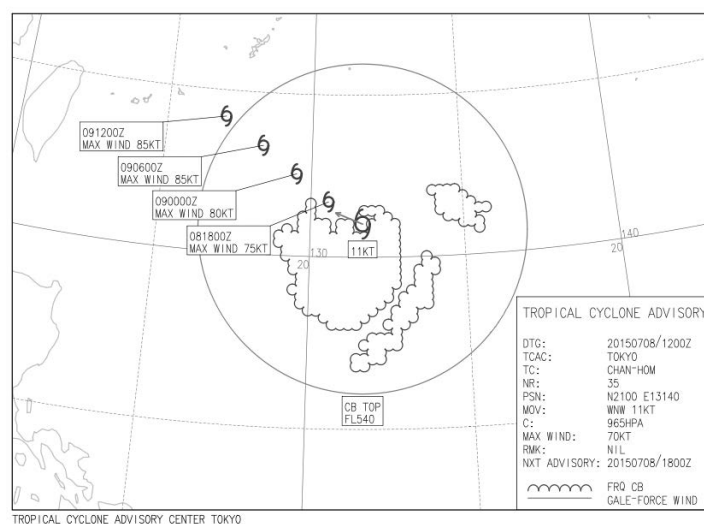
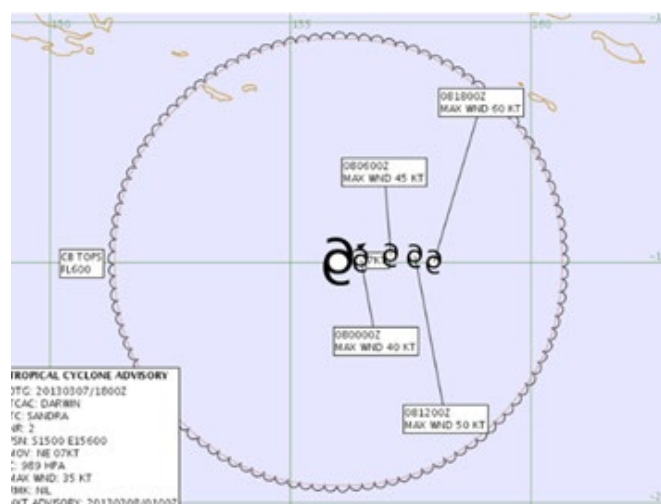
TCA and WC SIGMET Examples

Tropical Cyclone Advisory (TCA) Example

FKAU05 ADRM 071830
 TC ADVISORY
 DTG: 20130307/1800Z
 TCAC: DARWIN
 TC: SANDRA
 NR: 02
 PSN: S1500 E15600
 MOV: NE 07KT
 C: 989HPA
 MAX WIND: 35KT
 FCST PSN +6HR: 08/0000Z S1500 E15630
 FCST MAX WIND +6HR: 40KT
 FCST PSN +12HR: 08/0600Z S1448 E15706
 FCST MAX WIND +12HR: 45KT
 FCST PSN +18HR: 08/1200Z S1454 E15736
 FCST MAX WIND +18HR: 50KT
 FCST PSN +24HR: 08/1800Z S1500 E15800
 FCST MAX WIND +24HR: 60KT
 RMK: NIL
 NXT MSG: 20130308/0100Z

FKPQ30 RJTD 081200
 TC ADVISORY
 DTG: 20150708/1200Z
 TCAC: TOKYO
 TC: CHAN-HOM
 NR: 35
 PSN: N2100 E13140
 MOV: WNW 12KT
 C: 965HPA
 MAX WIND: 70KT
 FCST PSN +6HR: 08/1800Z N2140 E13035
 FCST MAX WIND +6HR: 75KT
 FCST PSN +12HR: 09/0000Z N2230 E12930
 FCST MAX WIND +12HR: 80KT
 FCST PSN +18HR: 09/0600Z N2320 E12820
 FCST MAX WIND +18HR: 85KT
 FCST PSN +24HR: 09/1200Z N2410 E12700
 FCST MAX WIND +24HR: 85KT
 RMK: NIL
 NXT MSG: 20150708/1800Z =

Tropical Cyclone Advisory Graphic (TCG) Example



Tropical Cyclone SIGMET Format

WCAAii CCC YGGgg [BBB]
 CCC SIGMET [n][n]n VALIDYYGGgg/YYGGgg CCC-CCC
 <FIR/CTA Name> FIR TC <Name> PSN <position>
 CB OBS/FCST [AT GGggZ] <Location> <Level>
 <Movement> <Changes in intensity> <Forecast time and
 forecast position> <Repetition of elements> =

Tropical Cyclone SIGMET (WC) Example (with movement)

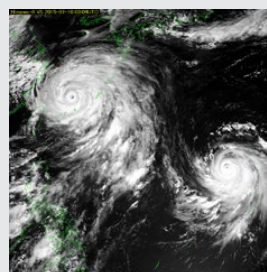
WCAU01 ABRF 071910
 YBBB SIGMET D02 VALID 071915/080115 YBRF-
 YBBB BRISBANE FIR TC SANDRA PSN S1500 E15600 CB
 OBS AT 1800Z WI 280NM OFTC CENTRE TOP FL500 MOV
 NE 07KT INTSF =

Cancellation

WCAU01 ABRF 100515
 YBBB SIGMET D12 VALID 100515/100715 YBRF-
 YBBB BRISBANE FIR CNL SIGMET D06 100115/100715=

Tropical Cyclone SIGMET (WC) Example (with forecast position)

WCJP31 RJTD 081310
 RJJJ SIGMET K01 VALID 081310/061910 RJTD-
 RJJJ FUKUOKA FIR TC CHAN-HOM PSN N2100 E13140 CB OBS AT
 1200Z WI N1625 E13155 - N1830 E12935 - N2030 E12845 - N2140
 E13000 - N2125 E13220 - N1920 E13430 - N1625 E13155 TOP
 FL540 NC FCST AT 1800Z TC CENTRE PSN N2140 E13035=



Tropical cyclones
 Chan-hom and Nangka,
 10 July 2015 from
 Himawari-8. Image
 courtesy of JMA.

Refer to the following for more information

- ICAO Annex 3 – Meteorological Service for International Air Navigation (Amd 77)
- ICAO Regional SIGMET Guide
- ICAO Doc.8896 – Manual of Aeronautical Meteorological Practice
- WMO No.49 Technical Regulations Volume II – Meteorological Service for International Air Navigation (2013 ed)
- WMO No.732 Guide to Practices for Meteorological Offices Serving Aviation

SIGMET QUICK REFERENCE GUIDE

WV SIGMET

AMD 77
DRAFT 1

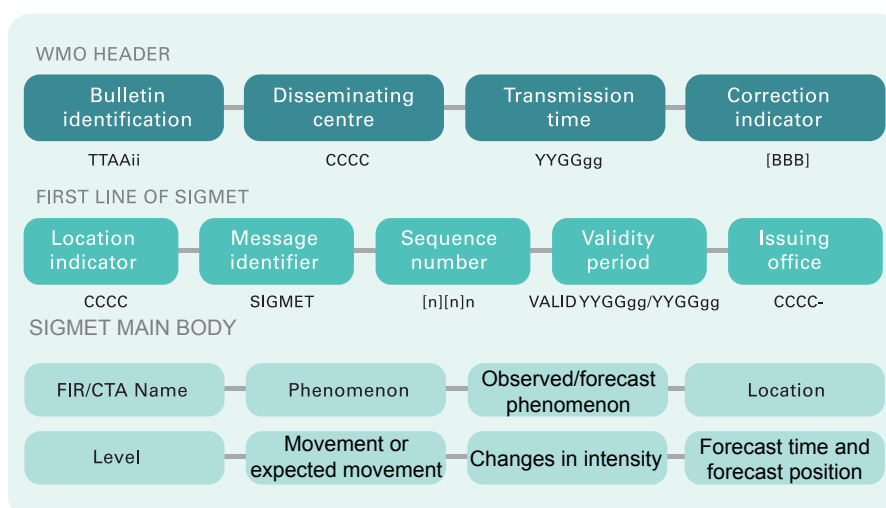
SIGMET Abbreviations

APRX	Approximately
BTN	Between
CLD	Cloud
CNL	Cancel or cancelled
CTA	Control area
EXP	Expected
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KM	Kilometres
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
MT	Mountain
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
PSN	Position
SFC	Surface
STNR	Stationary
UIR	Upper Information Region
VA	Volcanic Ash
WI	Within (area)
WID	Wide
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WV SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WV SIGMET provides information on volcanic ash and should be based on the Volcanic Ash Advisory.

SIGMET Structure



WMO Header

Bulletin identification

TT	Data type designator	WV – for SIGMET for volcanic ash
AA	Country or territory designators	Assigned according to Table C1, Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to Part II of <i>Manual on the Global Telecommunication System, Volume I – Global Aspects</i> (WMO Publication No. 386)

Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

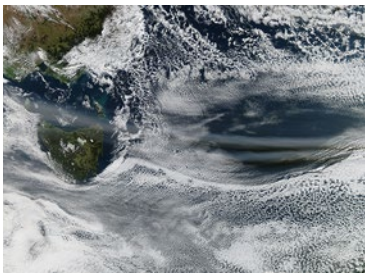
Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).





Sarychev volcano, on Matua Island in the Kuril Islands, erupting on 12 June 2009. Image courtesy NASA.



Ash over Tasmania from Puyehue-Cordón Caulle volcano, Chile, 13 June 2011. Image courtesy NASA, Satellite, Aqua.



Sakurajima volcano, in southern Japan is one of the most active volcanoes in the world. Image courtesy Kimon Berlin.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. For observed volcanic ash, the start of validity for the SIGMET should be the same as the issue time. For forecast volcanic ash, the start of validity should be the time the volcanic ash is expected to enter/develop in a MWO's FIR and can be issued no more than 12 hours prior to the start of validity. The validity period for a WV SIGMET shall be no more than 6 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

SIGMET Main Body

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR]** or **CCCC <name> CTA**.

Phenomenon

The description of the volcanic ash consists of: **VA ERUPTION [MT volcano name] PSN <location> VA CLD**

Observed or forecast phenomenon

Whether the volcanic ash is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the volcanic ash is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

The number of coordinates should be kept to a minimum and should not normally exceed seven.

If the volcanic ash covers the entire FIR or CTA the following can be used as an alternative: **ENTIRE FIR [/CTA]**

Level

The level and vertical extent of the volcanic ash given in one of the following formats: **[SFC]/FLnnn** or **[SFC]/nnnnM** or **[SFC]/[n]nnnnFT** or

TOP FLnnn or **ABV FLnnn** or **TOP ABV FL nnn**

FLnnn/nnn or **[nnnn]/nnnnM** or **[n]nnnn/[n]nnnnFT** or **[nnnnM]/FLnnn** or **[n]nnnnFT/FLnnn**

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west

Movement or expected movement (not included if "forecast time" and "forecast position" are given)

Direction and rate of movement of the volcanic ash where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Changes in intensity

The expected evolution of the volcanic ash's intensity as indicated by: **INTSF** or **WKN** or **NC**

Forecast time and forecast position (not included if movement is given)

The forecast position of the volcanic ash in the form:
FCST AT <GGgg> Z
 or **FCST AT <GGgg>Z ENTIRE FIR[/CTA]**
 or **FCST AT <GGgg>Z NO VA EXP**

Repetition of elements

This is used to repeat the elements in a SIGMET message when two volcanic ash clouds occur simultaneously in an FIR. The descriptor **AND** is used to separate the elements for each volcanic ash cloud.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the volcanic ash is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the volcanic ash is no longer evident or if it has moved out of the FIR, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation **CNL** in lieu of meteorological information.

CNL SIGMET [n][n]n YYGGgg/YYGGgg

Source of Information

Source of Information	Types of Information	Issue a VA SIGMET
VAAC	Advice that ash is observed or is expected to enter the MWO's FIR at a specific time in the future.	Issue immediately
Volcano Observatory	Details of an eruption with either no information about any ash or the extent of any ash cloud. These may be received in the form of a Volcano Observatory Notice for Aviation (VONA).	Issue immediately
Pilot Report, Met Office, ATS Unit	Report of an eruption with or without associated ash, or an ash encounter without any reference to a specific volcano. Note: All reports should be forwarded on to the responsible VAAC without delay.	Issue immediately, even if no information received from a VAAC



Tavurvur Volcano, Rabaul, 8 December 2009. More than a foot of ash fell on parts of the city, and combined with rain, it collapsed many of the small city's buildings and houses. Image courtesy NASA, Earth Observatory.

SIGMET Dissemination

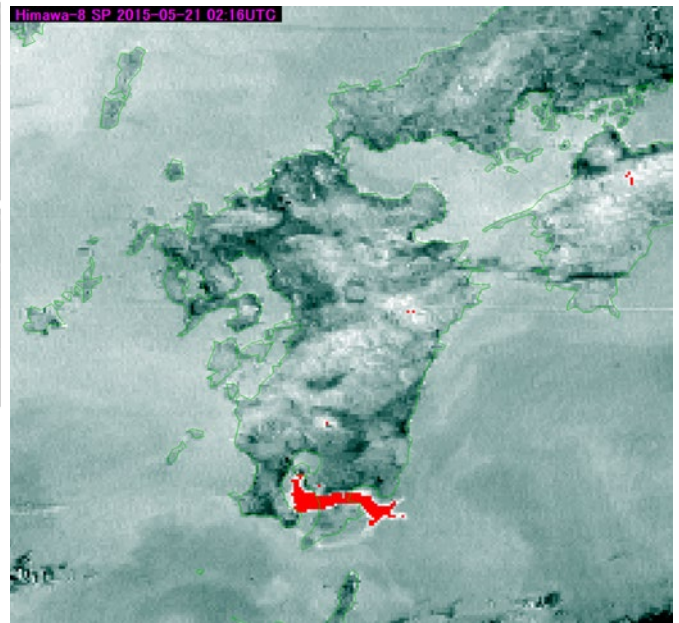
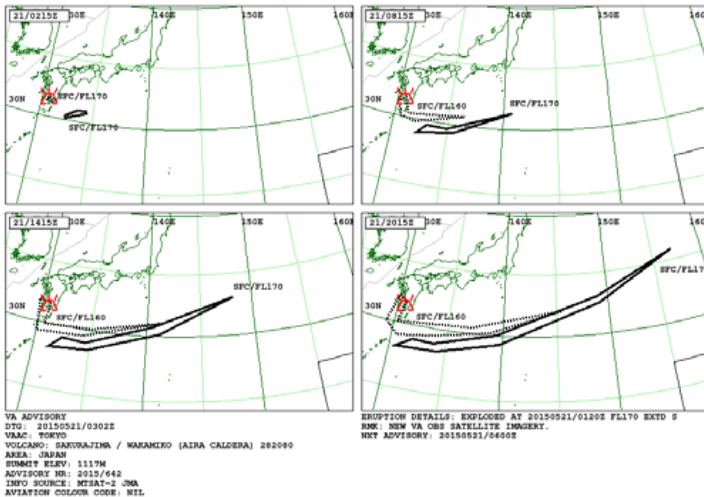
SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

VAA, VAG and WV SIGMET Example 1

Volcanic Ash Advisory (VAA) Example

FVFE01 RJTD 210302
 VA ADVISORY
 DTG: 20150521/0302Z
 VAAC: TOKYO
 VOLCANO: SAKURAJIMA / WAKAMIKO (AIRA CALDERA) 282080
 PSN: N3136 E13039
 AREA: JAPAN
 SUMMIT ELEV: 1117M
 ADVISORY NR: 2015/642
 INFO SOURCE: MTSAT-2 JMA
 AVIATION COLOUR CODE: NIL
 ERUPTION DETAILS: EXPLODED AT 20150521/0120Z FL170 EXTD S
 OBS VA DTG: 21/0215Z
 OBS VA CLD: SFC/FL170 N3020 E13225 - N3051 E13328 - N3056 E13414 - N3042 E13422 - N3009 E13229 MOV E 35KT SFC/FL170 N3134 E13042 - N3121 E13117 - N3110 E13108 - N3119 E13031 MOV SE 45KT
 FCST VA CLD +6 HR: 21/0815Z SFC/FL170 N2939 E13308 - N2936 E13456 - N3116 E14050 - N2923 E13534 - N2856 E13219 SFC/FL160 N3113 E13012 - N3129 E13045 - N3020 E13114 - N3045 E13627 - N2946 E13155 - N3003 E13034
 FCST VA CLD +12 HR: 21/1415Z SFC/FL170 N2858 E13433 - N3043 E14030 - N3303 E14809 - N3009 E14109 - N2828 E13451 - N2814 E13124 - N2907 E13225 SFC/FL160 N3144 E12945 - N3143 E13049 - N2957 E13035 - N3006 E13458 - N3104 E14120 - N2929 E13413 - N2918 E13001
 FCST VA CLD +18 HR: 21/2015Z SFC/FL170 N2959 E13924 - N3301 E14857 - N3551 E15658 - N3231 E14905 - N2916 E13941 - N2814 E13412 - N2809 E13035 - N2855 E13156 - N2849 E13352 SFC/FL160 N3209 E13000 - N3142 E13046 - N3003 E13019 - N3027 E13706 - N3203 E14530 - N3010 E13850 - N2924 E13334 - N2901 E13028 - N3000 E12917
 RMK: NEW VA OBS SATELLITE IMAGERY.
 NXT ADVISORY: 20150521/0600Z=

Volcanic Ash Graphic (VAG) Example



Infrared difference satellite imagery by Himawari-8 during its pre-operational phase. The red-coloured region indicates volcanic ash. Image courtesy Japan Meteorological Agency.

Volcanic Ash (WV) SIGMET Example

WVJP31 RJTD 210320
 RJJJ SIGMET E05 VALID 210320/210920 RJTD-
 RJJJ FUKUOKA FIR VA ERUPTION MT SAKURAJIMA-
 WAKAMIKO(AIRA-CALDERA) PSN N3136 E13039 VA CLD
 OBS AT 0215Z WI N3020 E13225 - N3051 E13328 - N3056
 E13414 - N3042 E13422 - N3009 E13229 - N3020 E13225 SFC/
 FL170 NC FCST AT 0815Z WI N2939 E13308 - N2936 E13456
 - N3116 E14050 - N2923 E13534 - N2856 E13219 - N2939
 E13308 AND WI N3134 E13042 - N3121 E13117 - N3110
 E13108 - N3119 E13031 - N3134 E13042 SFC/FL170 NC
 FCST AT 0815Z WI N3113 E13012 - N3129 E13045 - N3020
 E13114 - N3045 E13627 - N2946 E13155 - N3003 E13034 -
 N3113 E13012=

VAA, VAG and WV SIGMET Example 2

Volcanic Ash Advisory (VAA) Example

VA ADVISORY
 DTG: 20140213/1752Z
 VAAC: DARWIN
 VOLCANO: KELUT 263280
 PSN: S0756 E11219
 AREA: INDONESIA
 SUMMIT ELEV: 1731M
 ADVISORY NR: 2014/2
 INFO SOURCE: MTSAT, MEDIA

AVIATION COLOUR CODE: RED
 ERUPTION DETAILS: VA PLUME OBS TO FL450 EXTENDING 50NM TO W AT13/1632Z.
 OBS VA DTG: 13/1745Z
 OBS VA CLD: SFC/FL450 S0715 E11255 - S0720 E11105 - S0825 E11100 - S0830 E11245 - S0715 E11255
 MOV W 05KT

FCST VA CLD +6HR: 13/2345Z SFC/FL450 S0720 E11255 - S0715 E11050 - S0830 E11045 - S0835 E11250 - S0720 E11255

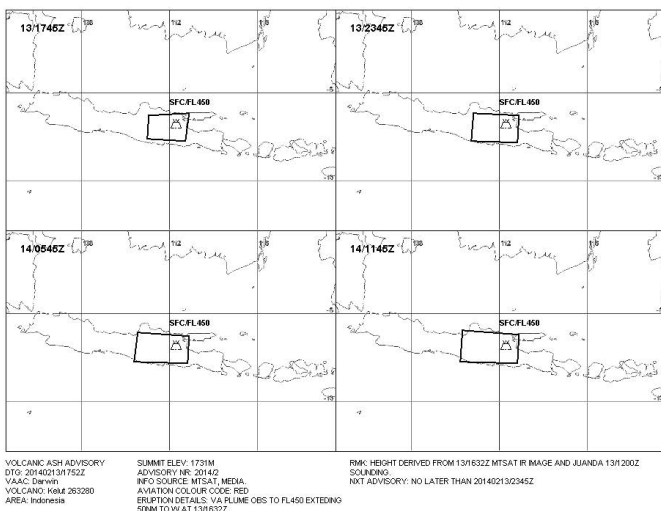
FCST VA CLD +12HR: 14/0545Z SFC/FL450 S0720 E11255 - S0710 E11035 - S0830 E11025 - S0835 E11250 - S0720 E11255

FCST VA CLD +18 HR: 14/1145Z SFC/FL450 S0715 E11255 - S0705 E11020 - S0830 E11015 - S0835 E11250 - S0715 E11255

RMK: HEIGHT DERIVED FROM 13/1632Z MTSAT IR IMAGE AND JUANDA 13/1200Z SOUNDING.

NXT ADVISORY: NO LATER THAN 20140213/2345Z

Volcanic Ash Graphic (VAG) Example



Volcanic Ash (WV) SIGMET Format

WVAaii CCCCYYGGgg [BBB]
 CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-
 CCCC <FIR/CTA Name> FIR/CTA VA ERUPTION MT <name>
 PSN <location> VA CLD OBS/FCST [AT GGggZ] <Location>
 <Level> <Movement or expected movement> <Changes in
 intensity> <Forecast time and forecast position>=

Volcanic Ash (WV) SIGMET Example

WVID21 WAAA 131805
 WAAZ SIGMET A01 VALID 131745/132345 WAAA-
 WAAZ UJUNG PANDANG FIR VA ERUPTION MT KELUT
 PSN S0756 E11219 VA CLD OBS AT 1745Z WI S0715
 E11255 - S0720 E11105 - S0825 E11100 - S0830 E11245
 S0715 E11255 SFC/FL450 NC FCST AT 2345Z WI S0720
 E11255 - S0715 E11050 - S0830 E11045 - S0835 E11250 -
 S0720 E11255=

Cancellation

WVNG20 AYPY 072250
 AYPY SIGMET A5 VALID 072300/080200 AYPY-
 AYPY PORT MORESBY FIR CNL SIGMET A4 072000/080200=

Refer to the following for more information

ICAO Annex 3 – Meteorological Service for International Air Navigation (Amd 77)
 ICAO Regional SIGMET Guide
 ICAO Doc.8896 – Manual of Aeronautical Meteorological Practice
 WMO No.49 Technical Regulations Volume II – Meteorological Service for International
 Air Navigation (2013 ed)
 WMO No.732 Guide to Practices for Meteorological Offices Serving Aviation
 ICAO Doc. 9691 – Manual on Volcanic Ash, Radioactive Material and Toxic Chemical
 Clouds
 ICAO Doc. 9766 – Handbook on the International Airways Volcano Watch