Updates to the Regional SIGMET Guide

MET/S WG Ad Hoc Group
(Australia, Hong Kong China, Japan and New Zealand)

Web-conference, 27 - 31 July 2020
ICAO APAC MET/IE WG/18 and MET/S WG/10

Introduction

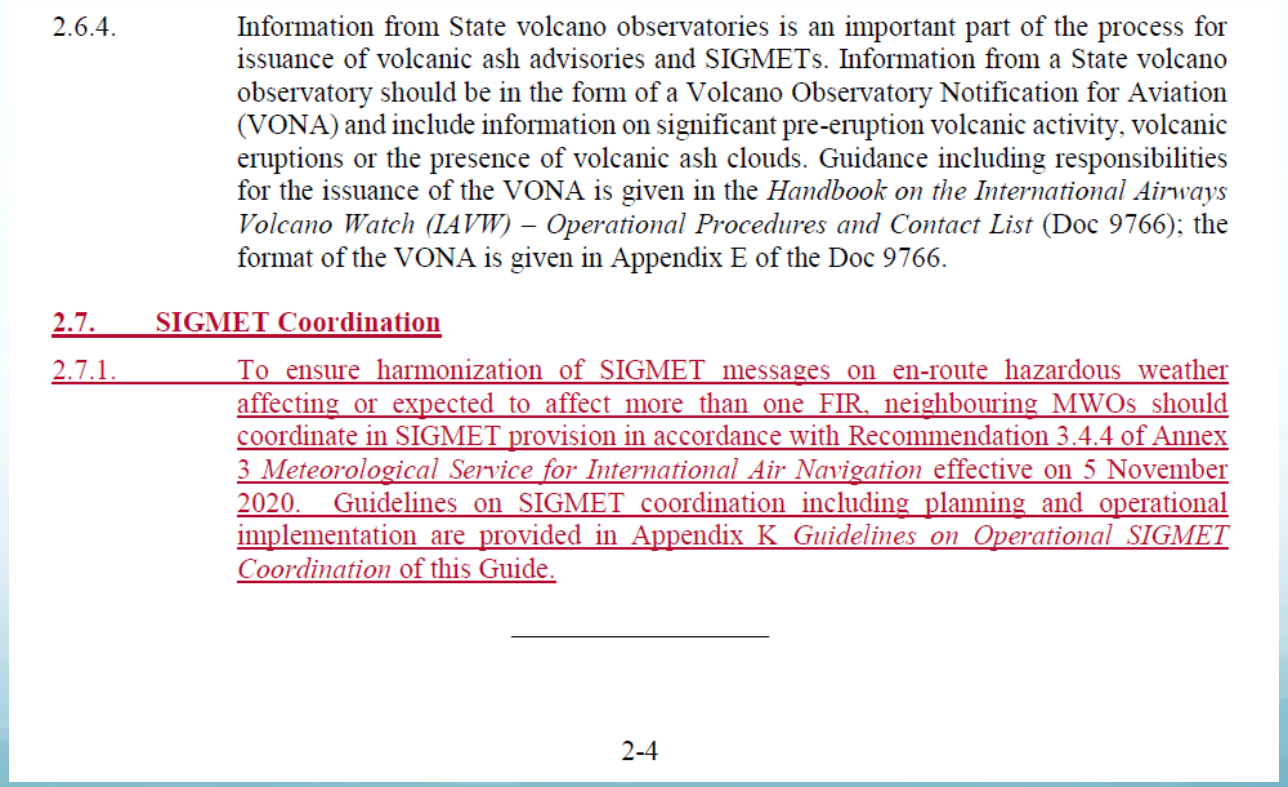
- **The Asia/Pacific Regional SIGMET Guide is intended to provide regional guidance for the standardization and harmonization of procedures and formats to related SIGMET information.**
- **This paper proposes updates of the SIGMET Guide based on the Annex 3 Amendment 79.**

Discussion

- **The MET/S WG ad hoc group consisting of Australia, Hong Kong China, New Zealand and Japan drafted the updated SIGMET Guide.**
  - **Annex 3 Amendment 79**
  - **SIGMET test procedure**
  - **Some minor typographical and editorial corrections**
- **The draft APAC Regional SIGMET Guide 8th edition is in the Attachment to this paper.**

Major point of the update

- **Main body (p. 2-4)**
  - **Added “Section 2.7”**
    Based on the recommendation of SIGMET coordination added to Annex 3 as the section 3.4.4.



2.6.4. Information from State volcano observatories is an important part of the process for issuance of volcanic ash advisories and SIGMETs. Information from a State volcano observatory should be in the form of a Volcano Observatory Notification for Aviation (VONA) and include information on significant pre-eruption volcanic activity, volcanic eruptions or the presence of volcanic ash clouds. Guidance including responsibilities for the issuance of the VONA is given in the *Handbook on the International Airways Volcano Watch (IAVW) – Operational Procedures and Contact List* (Doc 9766); the format of the VONA is given in Appendix E of the Doc 9766.

2.7. SIGMET Coordination

2.7.1. To ensure harmonization of SIGMET messages on en-route hazardous weather affecting or expected to affect more than one FIR, neighbouring MWOs should coordinate in SIGMET provision in accordance with Recommendation 3.4.4 of Annex 3 *Meteorological Service for International Air Navigation* effective on 5 November 2020. Guidelines on SIGMET coordination including planning and operational implementation are provided in Appendix K *Guidelines on Operational SIGMET Coordination* of this Guide.

2-4

Major point of the update

- **Main body (p. 3-2)**
  - **Revised “Table 1”**
    Based on the modified value of EDR for SEV TURB in the section 2.6.2 of the Annex 3.

SEV TURB	Severe turbulence referring to: • low-level turbulence associated with strong surface winds; • rotor streaming; or • clear air turbulence, whether in cloud or not in cloud. *Note. — Turbulence should not be used in connection with convective clouds. Severe turbulence shall be considered whenever the peak value of ~~the cube root of~~ EDR equals or exceeds 0.~~7~~45.*
SEV ICE	Severe icing not associated with convective cloud.
SEV ICE (FZRA)	Severe icing caused by freezing rain and not associated with convective cloud.
SEV MTW	Severe mountain wave the accompanying downdraft is 3 m/s (600 ft/min) or more or when severe turbulence is observed or forecast.
HVY DS	Heavy duststorm where the visibility is below 200 m and the sky is obscured.
HVY SS	Heavy sandstorm where the visibility is below 200 m and the sky is obscured.
VA	Volcanic ash
RDOACT CLD	Radioactive cloud

Table 1: *SIGMET phenomena abbreviations and descriptions*

Major point of the update

- **Main body (p. 3-2)**
  - **Revised “Section 3.5.3.5”**
    Based on the modified footnote 21 and 22 of Table A6-1A of the Annex 3.

3.5.3.5. Indication whether the phenomenon is observed or forecast

OBS
or
OBS AT GGggZ
or
FCST
or
FCST AT GGggZ

The indication whether the phenomenon is observed or forecast is given by using the abbreviations **OBS** or **FCST**. **OBS AT** and **FCST AT** may be used, in which case they are followed by a time group in the form **GGggZ**. If the phenomenon is observed, **GGggZ** is the time of the observation 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.

Examples:

OBS

OBS AT 0140Z

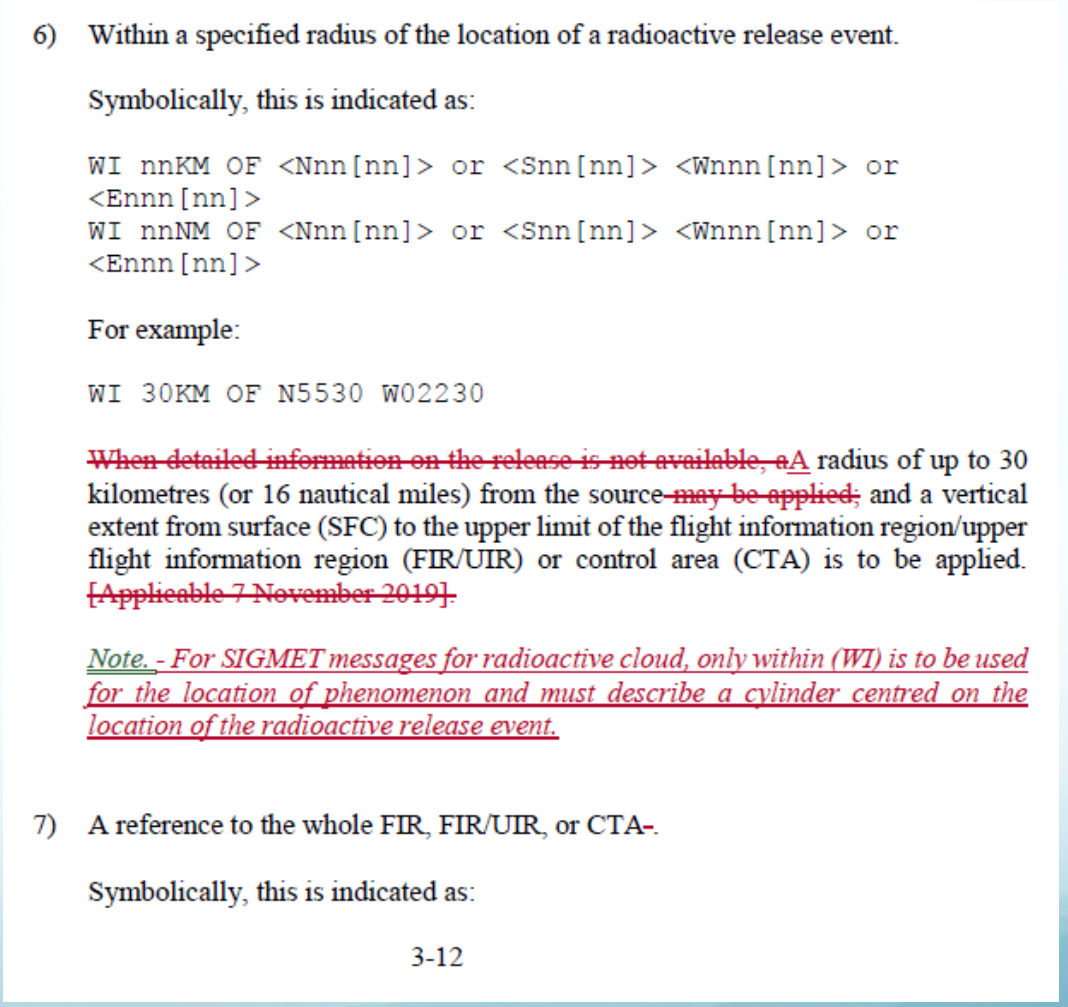
FCST

FCST AT 0200Z

Note. — In the case of volcanic ash cloud covering more than one area within the FIR or cumulonimbus clouds associated with a tropical cyclone covering more than one area within the FIR, when elements such as location and forecast position are repeated, each location and forecast position must be preceded by an observed or forecast time.

Major point of the update

- **Main body (p. 3-12)**
  - **Revised "Section 3.5.3.6 6)"**
    Based on the modified footnote 25 and 33 of Table A6-1A of the Annex 3.



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

Symbolically, this is indicated as:

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

For example:

```
WI 30KM OF N5530 W02230
```

~~When detailed information on the release is not available, a~~A radius of up to 30 kilometres (or 16 nautical miles) from the source ~~may be applied;~~ and a vertical extent from surface (SFC) to the upper limit of the flight information region/upper flight information region (FIR/UIR) or control area (CTA) is to be applied. ~~[Applicable 7 November 2019].~~

Note. - For SIGMET messages for radioactive cloud, only within (WI) is to be used for the location of phenomenon and must describe a cylinder centred on the location of the radioactive release event.

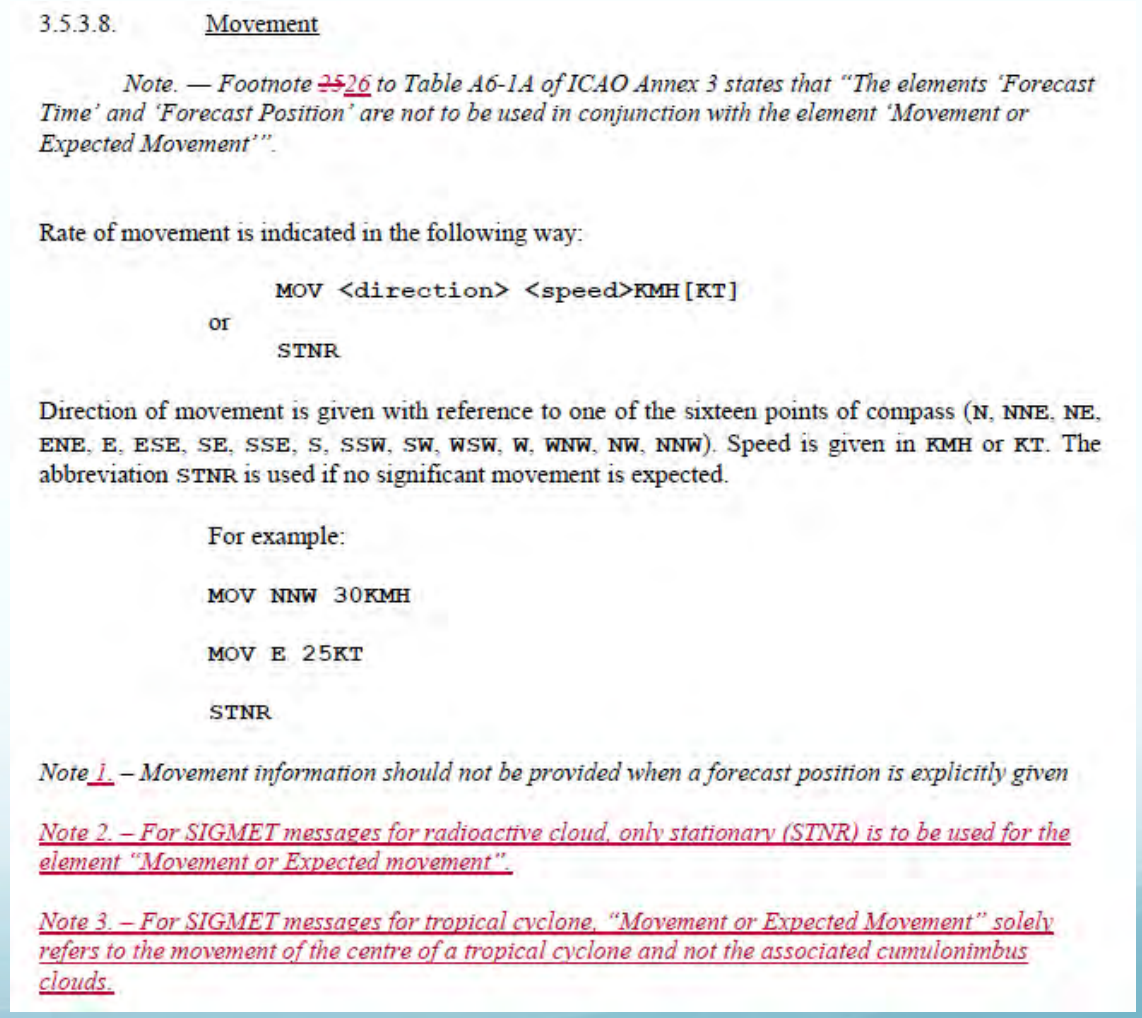
7) A reference to the whole FIR, FIR/UIR, or CTA-.

Symbolically, this is indicated as:

3-12

Major point of the update

- **Main body**
  Section 3.5.3.8 (p. 3-16)
  - **Added “Note 2”**
    Based on the modified footnote 33 of Table A6-1A of the Annex 3.
  - **Added “Note 3”**
    Supplementary note about “Movement or Expected Movement” element for SIGMET for TC.
  - **Editorial changes**



3.5.3.8. Movement

Note. — Footnote ~~25~~26 to Table A6-1A of ICAO Annex 3 states that “The elements ‘Forecast Time’ and ‘Forecast Position’ are not to be used in conjunction with the element ‘Movement or Expected Movement’”.

Rate of movement is indicated in the following way:

MOV <direction> <speed>KMH[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.

For example:

MOV NNW 30KMH

MOV E 25KT

STNR

Note 1. – Movement information should not be provided when a forecast position is explicitly given

Note 2. – For SIGMET messages for radioactive cloud, only stationary (STNR) is to be used for the element “Movement or Expected movement”.

Note 3. – For SIGMET messages for tropical cyclone, “Movement or Expected Movement” solely refers to the movement of the centre of a tropical cyclone and not the associated cumulonimbus clouds.

Major point of the update

- **Main body Section 3.5.3.9 (p. 3-16)**
  - **Added “Note”**
    Supplementary note about “Changes in Intensity” element for SIGMET for TC.

3.5.3.9. Expected changes in intensity

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

INTSF

or

WKN

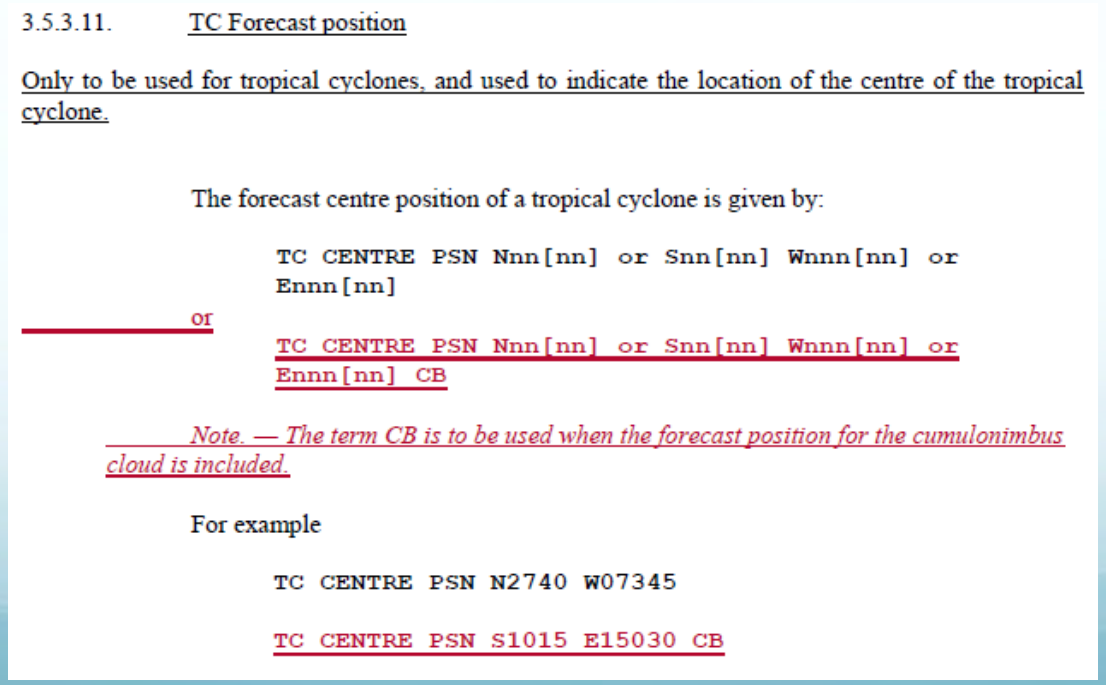
or

NC

Note. – For SIGMET messages for tropical cyclone, this element indicates the change of the maximum surface winds around a tropical cyclone and not the intensity of the associated cumulonimbus clouds.

Major point of the update

- **Main body Section 3.5.3.11 (p. 3-17)**
  - **Added a new type of format**
    Based on the modified template about “TC forecast position” element and footnote 31 of Table A6-1A of the Annex 3.



3.5.3.11. TC Forecast position

Only to be used for tropical cyclones, and used to indicate the location of the centre of the tropical cyclone.

The forecast centre position of a tropical cyclone is given by:

TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]

or

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

Note. — The term CB is to be used when the forecast position for the cumulonimbus cloud is included.

For example

TC CENTRE PSN N2740 W07345

TC CENTRE PSN S1015 E15030 CB

Major point of the update

- **Main body Section 3.5.3.13 (p. 3-18)**
  - **Revised the description of this section**

    Based on the modified footnote 29 of Table A6-1A of the Annex 3.
  - **Added “Note 2”**
    Supplementary note about CB areas included in SIGMET for TC.

3.5.3.13. Repetition of elements (volcanic ash and tropical cyclone SIGMET only)

Elements can be repeated when there are instances of ~~two~~more than one volcanic ash ~~clouds~~cloud, or ~~two~~more than one area~~s~~ of cumulonimbus cloud associated with a tropical cyclone.

Note 1. — This must not be used for two separate tropical cyclones that are present in a FIR, or UIR.

Note 2. — For SIGMET messages for tropical cyclone, this should be used for areas of cumulonimbus clouds associated with a tropical cyclone, not all cumulonimbus clouds in a FIR.

With regard to the portrayal of complex volcanic ash events (which implies areas of volcanic ash at different levels) guidance in this regard is provided in Appendix B, example ~~9~~8.

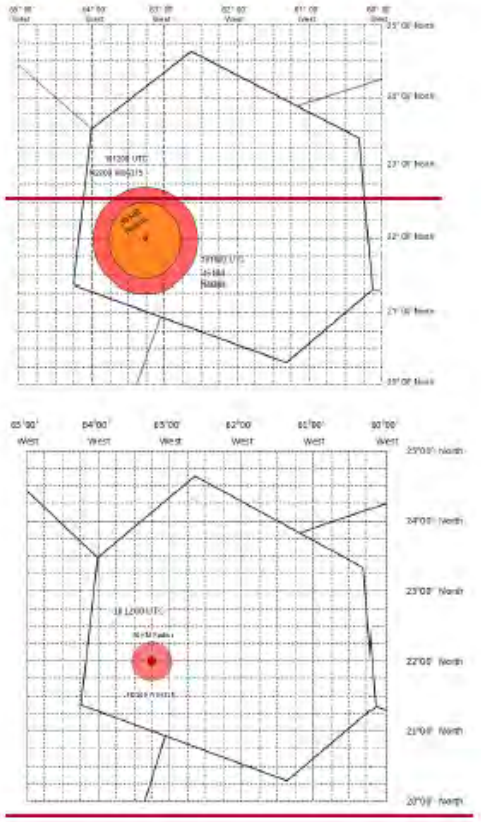
With regard to the portrayal of ~~two areas~~more than one area of cumulonimbus ~~clouds~~cloud associated with a tropical cyclone, guidance is provided in Appendix B, example 10.

Major point of the update

- **Appendix B 5) (p. B-16)**
  - **Revised the an example**
    Based on the footnote 25 of the Table A6-1A of the Annex 3.

5) A vertical cylinder of specified radius.

~~Where the surface position at the centre of the~~For SIGMET messages for radioactive cloud, a cylinder ~~does not change, but the~~of specified radius ~~increases~~was used.



YUDD SIGMET 2 VALID 101200/101600 YUSO-
YUDD SHANLON FIR/UIR RDOACT CLD OBS AT ~~1150Z~~1200Z WI ~~30NM~~30KM OF N2200 W06315 SFC/3000FT NC FCST AT 1600Z WI ~~45NM~~30KM OF N2200 W06315=

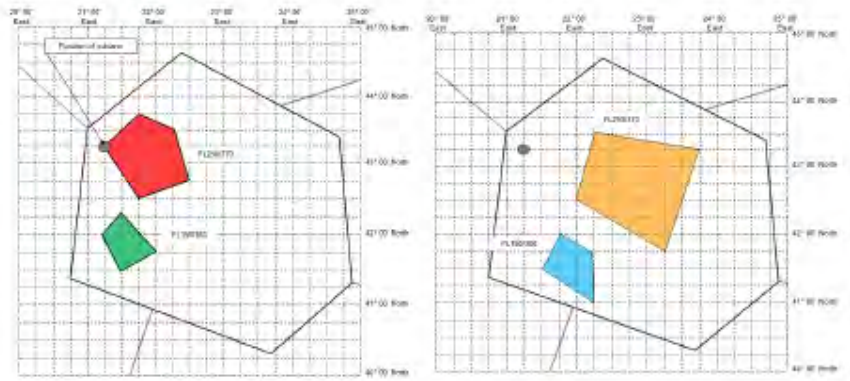
Major point of the update

- **Appendix B 8) (p. B-21)**
  - **Revised the an example**
    Based on the footnote 20 of the Table A6-1A of the Annex 3.

8) 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.



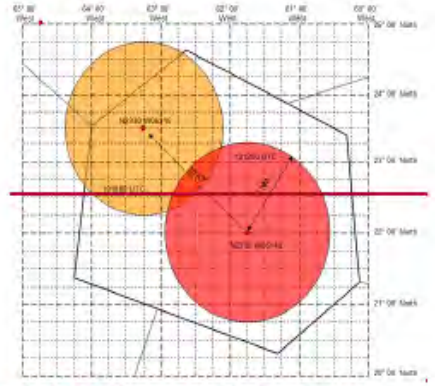
YUDD SIGMET 2 VALID 101200/101800 YUSO—
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 – N4330 E02215 – N4245 E02230 – N4230 E02145 – N4315 E02115 FL250/370 NC FCST AT 1800Z WI N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 – N4330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

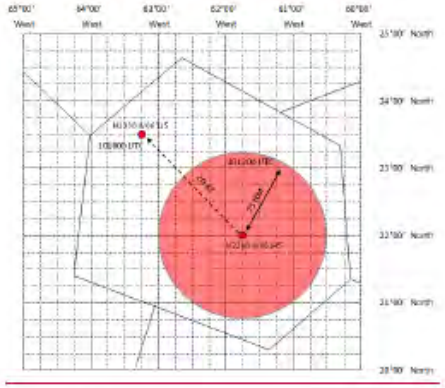
Major point of the update

- **Appendix B 9) (p. B-22 – B-24)**
  - **Modified a figure**
    In the case that the SIGMET dose not include “Forecast position” section.
  - **Typographical modification of the title**

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



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



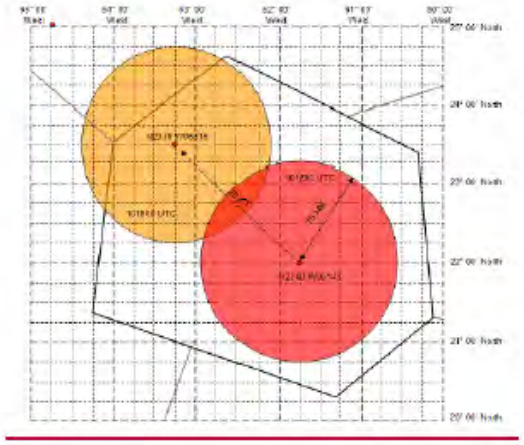
```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 075NM
OF TC CENTRE TOP BLW FL500 MOV NW 20KT WKN=

YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 075NM
OF TC CENTRE TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE PSN N2330
W06315=
```

Major point of the update

- **Appendix B 9) (p. B-22 – B-24)**
  - **Added a new example**
    In the case that the SIGMET includes “TC forecast position” and “Forecast position” sections.

When the SIGMET does include ‘TC forecast position’ and ‘Forecast position’ sections.

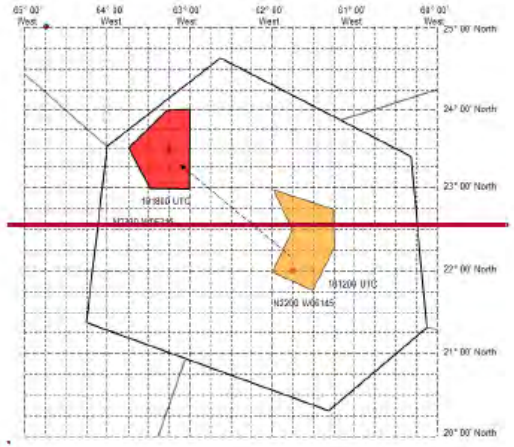


YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 075NM OF TC CENTRE TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE PSN N2330 W06315 CB WI 075NM OF TC CENTRE=

Major point of the update

- **Appendix B 9) (p. B-22 – B-24)**
  - **Modified a figure for clarification**
    As red shows OBS and yellow shows FCST.
  - **Added “CB” to the example**
    Based on “TC forecast position” section of the Table A6-1A of the Annex 3.

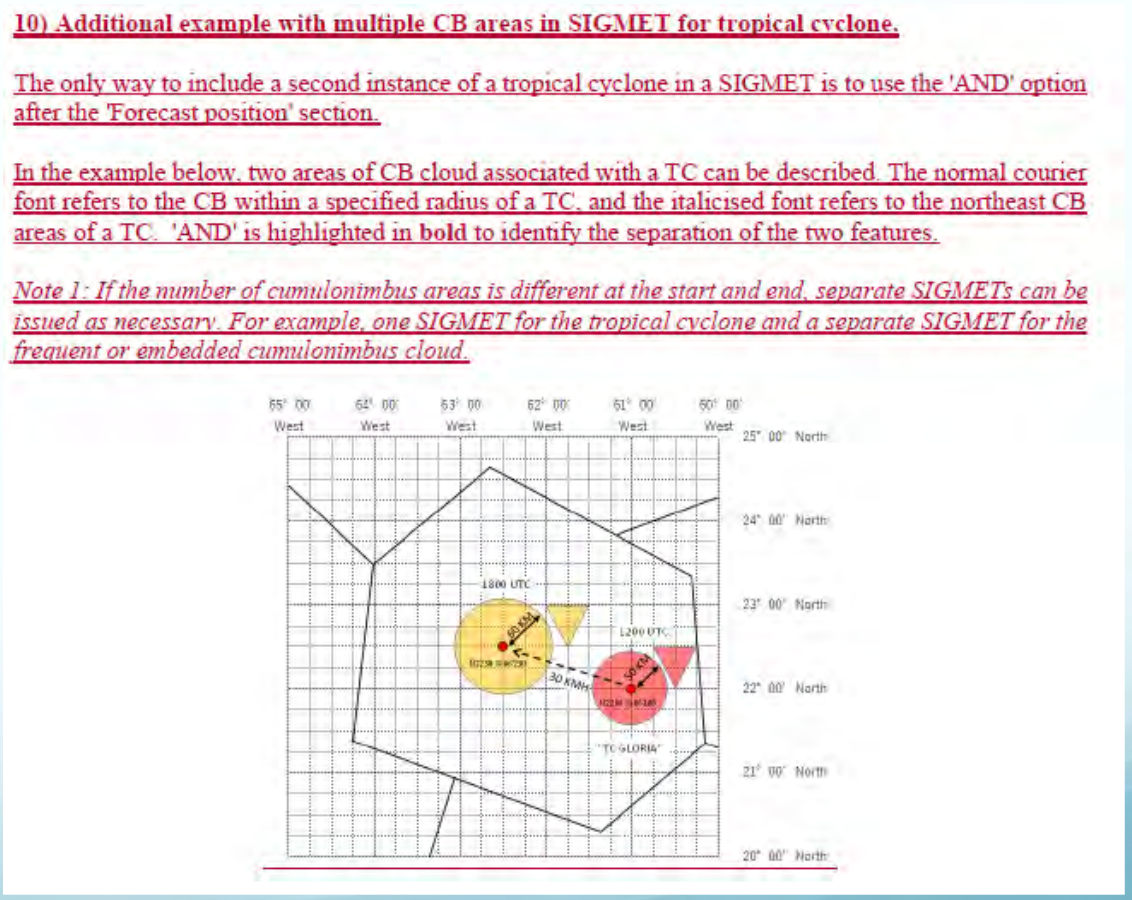
It is acceptable to use the other 'Location' options to describe the area affected by the CB of a Tropical Cyclone:



```
YUDD SIGMET 2 VALID 101200/101800 YUSO-
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI N2200
W06200 - N2230 W06145 - N2300 W06200 - N2245 W06115 - N2215 W06115 -
N2145 W06130 - N2200 W06200 TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE
PSN N2330 W06315 CB WI N2300 W06300 - N2400 W06300 - N2400 W06315 -
N2330 W06345 - N2300 W06330 - N2300 W06300=
```

Major point of the update

- **Appendix B 10) (p. B-24 – B-25)**
  - **Added a new section of examples for multiple CB areas associated with tropical cyclone**
    Based on the Table A6-1A and its footnote 21 and 29 of the Annex 3.
  - **Added “Note 1”**
    Supplementary note about the case that the number of CB areas is different at the start and end.
  - **Added “Note 2”**
    Supplementary note for the footnote 26 of the Table A6-1A of the Annex 3.



10) Additional example with multiple CB areas in SIGMET for tropical cyclone.

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

In the example below, two areas of CB cloud associated with a TC can be described. The normal courier font refers to the CB within a specified radius of a TC, and the italicised font refers to the northeast CB areas of a TC. 'AND' is highlighted in **bold** to identify the separation of the two features.

Note 1: If the number of cumulonimbus areas is different at the start and end, separate SIGMETs can be issued as necessary. For example, one SIGMET for the tropical cyclone and a separate SIGMET for the frequent or embedded cumulonimbus cloud.

Major point of the update

- **Appendix C**
  - **Revised the SIGMET test procedure**
    Based on the SIGMET test procedure in 2019 and the reorganization of BoM.

APPENDIX C

SIGMET TEST PROCEDURES

Note: While care is taken to ensure these instructions are correct, the instructions are for illustration only and may not be up to date. When participating in the annual SIGMET test, please follow the instructions supplied by ICAO specifically for that year's test.

1. INTRODUCTION ~~Introduction~~

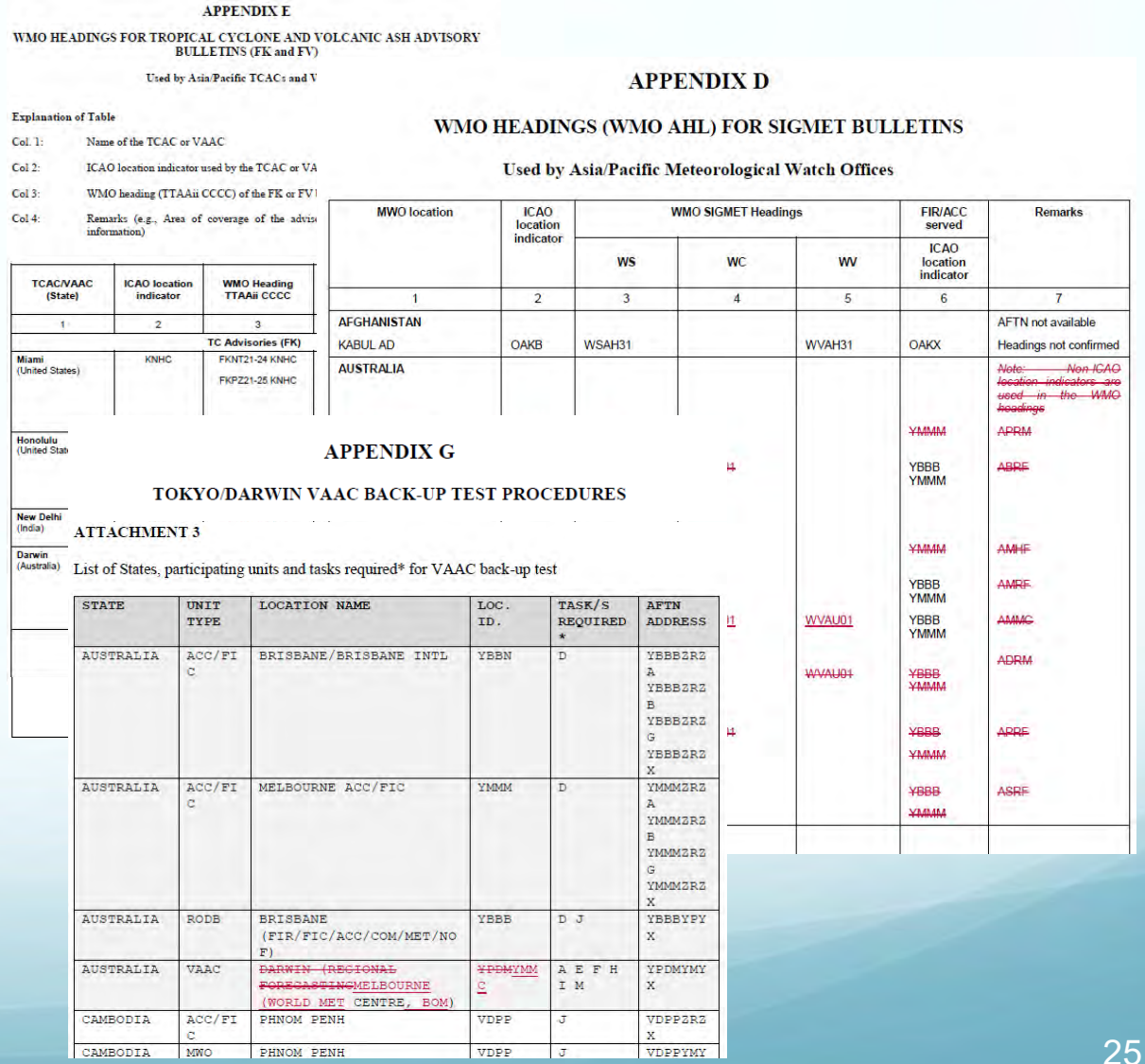
1.1. The Meteorology Divisional Meeting (2002) formulated Recommendation 1/12 b), *Implementation of SIGMET requirements,* which called, *inter alia,* for the relevant planning and implementation regional groups (PIRGs) to conduct periodic tests of the issuance and reception of SIGMET messages, especially those for volcanic ash.

1.2. This document describes the procedures for conducting regional SIGMET tests. The test procedures encompass all the three types of SIGMET messages, as follows:

- ~~SIGMET for volcanic ash (WV SIGMET);~~
- ~~SIGMET~~ messages for tropical cyclone (WC SIGMET); ~~and~~
- SIGMET messages for volcanic ash (WV SIGMET); and
- SIGMET messages for ~~other~~ weather and other phenomena apart from tropical cyclone and volcanic ash (WS SIGMET).

Major point of the update

- **Appendix D, E**
  - **Revised the table of WMO heading**
    Based on the reorganization of BoM.
- **Appendix G Attachment 3**
  - **Revised the list of States, participating unit and tasks**
    Based on the reorganization of BoM.



APPENDIX E

WMO HEADINGS FOR TROPICAL CYCLONE AND VOLCANIC ASH ADVISORY BULLETINS (FK and FV)

Used by Asia/Pacific TCACs and V

Explanation of Table

Col. 1: Name of the TCAC or VAAC

Col 2: ICAO location indicator used by the TCAC or VA

Col 3: WMO heading (TTAAii CCCC) of the FK or FV

Col 4: Remarks (e.g., Area of coverage of the advis information)

TCAC/VAAC (State)	ICAO location indicator	WMO Heading TTAAii CCCC
1	2	3
		TC Advisories (FK)
Miami (United States)	KNHC	FKNT21-24 KNHC FKPZ21-25 KNHC
Honolulu (United Stat		
New Delhi (India)		
Darwin (Australia)		

APPENDIX D

WMO HEADINGS (WMO AHL) FOR SIGMET BULLETINS

Used by Asia/Pacific Meteorological Watch Offices

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
AFGHANISTAN						AFTN not available
KABUL AD	OAKB	WSAH31		WVAH31	OAKX	Headings not confirmed
AUSTRALIA						~~Note: Non ICAO location indicators are used in the WMO headings~~
					~~YMMM~~	~~APRM~~
					YBBB YMMM	~~ABRF~~
					~~YMMM~~	~~AMHF~~
					YBBB YMMM	~~AMRF~~
				WVAU01	YBBB YMMM	~~AMMC~~
						ADRM
				~~WVAU01~~	~~YBBB YMMM~~	
					~~YBBB~~ YMMM	~~APRF~~
					~~YBBB~~ ~~YMMM~~	~~ASRF~~

APPENDIX G

TOKYO/DARWIN VAAC BACK-UP TEST PROCEDURES

ATTACHMENT 3

List of States, participating units and tasks required* for VAAC back-up test

STATE	UNIT TYPE	LOCATION NAME	LOC. ID.	TASK/S REQUIRED *	AFTN ADDRESS
AUSTRALIA	ACC/FIC	BRISBANE/BRISBANE INTL	YBBN	D	YBBBZRZA YBBBZRZB YBBBZRZG YBBBZRZX
AUSTRALIA	ACC/FIC	MELBOURNE ACC/FIC	YMMM	D	YMMMZRZA YMMMZRZB YMMMZRZG YMMMZRZX
AUSTRALIA	RODB	BRISBANE (FIR/FIC/ACC/COM/MET/NOF)	YBBB	D J	YBBBYPYX
AUSTRALIA	VAAC	~~DARWIN (REGIONAL FORECASTING~~MELBOURNE (WORLD MET CENTRE, BOM)	~~YPDMYMMC~~	A E F H I M	YPDMYMYX
CAMBODIA	ACC/FIC	PHNOM PENH	VDPP	J	VDPP2RZX
CAMBODIA	MWO	PHNOM PENH	VDPP	J	VDPPYMYX

Conclusion

- **The meeting is invited to consider the following actions.**

3.1 The meeting is invited to:

a) Note the information contained in this paper;

b) Propose any further updates to the SIGMET Guide as necessary; and

c) Adopt to submit the draft of the SIGMET Guide to the next MET SG meeting.