

International Civil Aviation Organization



**THE FOURTH MEETING OF ASIA/PACIFIC METEOROLOGICAL  
HAZARDS TASK FORCE (MET/H TF/4)**

ICAO Regional Sub-Office, Beijing, China

19 – 21 March 2014

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**Agenda Item C2: SIGMET and advisory information**

**e) Other SIGMET/advisory related business**

**PROPOSED CHANGES TO SIGMET FORMAT**

(Presented by Australia)

**SUMMARY**

This paper highlights some inconsistencies in the proposed format of SIGMET messages in Amendment 77 to Annex 3 – *Meteorological service for International Air Navigation* and recommends a number of changes and one addition to the format.

**1. INTRODUCTION**

1.1 The International Civil Aviation Organization (ICAO) and the World Meteorological Organization (WMO) Secretariats have published the proposed Amendment 77 to ICAO Annex 3 as a paper to conjoint ICAO Meteorology Divisional Meeting / WMO Commission for Aeronautical Meteorology to be held 7-18 July 2014 (refer to working paper WP/14-WP/11 | CAeM-15/Doc.11) . Whilst this paper proposes some significant improvements to the existing format, a number of inconsistencies within the SIGMET format remain.

1.2 This paper highlights some remaining inconsistencies in the proposed SIGMET format and recommends a number of changes.

**2. MULTIPLE POLYGONS AT A SINGLE TIME STEP**

2.1 The current and proposed SIGMET format supports multiple VA polygons or multiple tropical cyclones within a single SIGMET (e.g. where there are volcanic ash plumes at different altitudes). Annex 3 enables support for multiple polygons with the “AND” field. For example:

```

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 1800Z VA CLD
APRX N4330 E02215 - N4315 E02345 - N4145 E02315 - N4230 E02200 -
N4330 E02215 AND N4200 E02115 - N4217 E02130 - N4145 E02200 - N4130
E02130 - N4200 E02100 FL150/300 NC FCST 1800Z VA CLD APRX N4200
E02145 - N4145 E02215 - N4100 E02215 - N4130 E02130 - N4200 E02145=

```

2.2 However Annex 3 only allows the text “OBS” to be included once. This can result in confusion regarding whether the polygons/points described are forecast or observed. For example, in the above:

Polygon 1 is identified as OBS AT 1200Z

Polygon 2 is identified as FCST 1800Z

Polygon 3 is not identified as OBS or FCST or a time specified

Polygon 4 is identified as FCST 1800Z

2.3 So whilst it can be inferred that polygon 3 is likely to be an observation at 1200Z, for safety reasons this ambiguity should be removed and the SIGMET should explicitly state whether each polygon/point is an observation or a forecast and the corresponding time.

2.4 Consideration should also be given to whether ‘AND’ can be used for other SIGMET types, ie. for RDOACT CLD.

### 3. REMOVAL OF TERM ‘APRX’ AND ‘WID’

3.1 Table A6-1 of the proposed AMD 77 to ICAO Annex 3 introduced the concept of describing the position of a volcanic ash as a distance to a line. The concept is fully supported however the proposed change includes the use of the term “APRX”.

```

APRX nnKM WID LINE BTN (or 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]]

```

3.2 It is unclear why “APRX” has been introduced and how a pilot would interpret this field, particularly given its not applied to any other SIGMET parameter. It is recommended that APRX be removed and replaced with the within field (WI) to align within other SIGMET fields. For example:

```

APRX WI nnKM WID LINE BTN (or 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]]

```

3.3 It’s also unclear whether “WID LINE” is the distance between the two external boundaries or the distance from the centre line. To remove this ambiguity and to simplify the variations in the format it is proposed that “WID” be removed and the format refer to distance to a line. For example:

~~APRX~~ ~~WI~~ nnKM ~~WID~~ LINE BTN (or 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]]

3.4 It is also recommended that within a distance of line be enabled for all SIGMETs, rather than limiting its use to VA SIGMETs.

#### 4. ORDER OF PARAMETERS AND USE OF “AT” TIME FIELD

4.1 The introduction of multiple time steps within a single SIGMET has resulted in some inconsistencies in the order of parameters. For example:

```
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 - N4245 E02145 - N4330  
E02215 - N4245 E02230 - N4230 E02145 - N4315 E2115 FL250/370  
NC FCST 1800Z VA CLD WI N4315 E02115 - N4330 E02215 - N4315  
E02345 - N4145 E02315 - N4230 E02200 - N4315 E02115=
```

4.2 In the above example, the order of fields are:

```
[Phenomena] OBS AT [Time] [Position]  
FCST [Time] [Phenomena] [Position]
```

4.3 The above demonstrates the current order of fields varies between the initial and projected polygons. It is recommended the order of SIGMET parameters be reviewed and standardized for initial and projected position. It is recommended that the order of the initial polygon parameters be used for both initial and forecast polygons.

4.4 In addition, the above highlights that the initial polygon includes the text “AT”, to indicate that a time is included, but the projected polygon omits the “AT” identifier. It is recommended that the use of “AT” should be standardized in both the initial (OBS or FCST) and projected (FCST) time steps.

#### 5. CANCELLATION OF VA SIGMET

5.1 AMD 76 and the proposed AMD 77 include the requirement for the Cancellation of VA SIGMETs/AIRMETs to specify when a VA polygon is moving into a neighboring FIR. It is unclear why this required, and if it is required why it is not applicable to all SIGMETs, rather than just VA SIGMETs. In addition, volcanic ash may move into multiple FIRs and the existing format does not support reference to multiple FIRs.

#### 6. INCLUSION OF MULTIPLE LEVELS

6.1 The current and proposed format only allows a single ‘Level’ field can be included in a SIGMET (e.g TOP FL350, or FL250/350). This limits the use of multiple time steps within a SIGMET to when a SIGMET is not varying vertically. This can result in conservative forecasts whereby the vertical extent of the forecast is extended such that the initial and projected vertical extents are common. It is recommended that Level field be included for each observed or forecast position included within the SIGMET.

**7. RADIUS OF A POINT**

7.1 Annex 3 supports the definition of the position of phenomenon as a point, multi-point polygon or within a radius of a point. The latter is limited to TC's. Within a radius of point is an effective and efficient method of describing non-TC phenomena (such as frequent thunderstorms) although this is not currently supported in the proposed AMD 77 to Annex 3. It is recommended that within (WI) radial distance (KM or NM) of a point be included for at least WS SIGMETs. For example:

```
WSAU21 APRF 260255  
YMMM SIGMET A01 VALID 260300/260700 YPRF-  
YMMM MELBOURNE FIR EMBD TS FCST WI 120NM OF S1542 E9530 TOP  
FL450 MOV SW 5KT INTSF=
```

**8. INTENSITY**

8.1 The proposed Annex 3 retains the order of elements as per AMD 76 however note 26 now defines movement, or expected movement, as a conditional parameter which is only included when a single time step is included in the SIGMET. The intensity parameter remains a mandatory parameter. Given this, it is recommended the order of intensity and movement parameters be switched such that mandatory parameters are listed first, followed by conditional parameters.

**9. ACTION BY THE MEETING**

9.1 The meeting is invited to note the information in this paper.

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