International Civil Aviation Organization

SEVENTH MEETING OF THE ASIA/PACIFIC METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG/6)

Bangkok, Thailand, 22 – 24 March 2017

Agenda Item 6: Guidance and education related to the provision of meteorological services

THE ASIA/PACIFIC REGIONAL GUIDANCE ON THE ISSUANCE OF SIGMET FOR RADIOACTIVE CLOUD

(Presented by the Rapporteur, MET/S WG, Ad Hoc Group)

SUMMARY

This paper presents the latest international developments in the guidance on the issuance of SIGMET for radioactive clouds.

1. INTRODUCTION

1.1 At the sixth meeting of the Asia/Pacific Meteorological Services Working Group (MET/S WG/6) held in Bangkok, Thailand from 9 to 11 March 2016, it was decided that further action of the ad-hoc group responsible for developing regional guidance material on the issuance of SIGMET for radioactive cloud would not be necessary as it would wait for global developments in this area, which may be expected within 1 year, and further advice from the Meteorological Sub-group (MET SG) of APANPIRG as necessary, which would follow the MET SG's review of the outcomes from the Meteorology Panel (METP) Working Group for Meteorological Information and Service Development (WG-MISD) activities. The twentieth meeting of the MET SG held in Bangkok, Thailand from 6 to 9 June 2016 was informed of this decision.

1.2 In the global arena, the radioactive cloud SIGMET was discussed in the second meeting of METP WG-MISD held at Montreal, Canada from 11 to 13 July 2016. The outcome of this meeting was presented to the second meeting of METP (METP/2) held at Montreal, Canada from 17 to 21 October 2016.

1.3 This paper discusses the progress in the development of global guidance in the issuance of radioactive cloud SIGMET, the consequential draft Amendment 78 to Annex 3 — Meteorological Service for International Air Navigation.

2. OUTCOME OF METP/2

2.1 The phased concept proposed by WG-MISD in "*Initial Guidance*" in the issuance of radioactive cloud SIGMET was noted. Consistent with IAVWOPSG Memo/64 and the

recommendations by IAEA and IACRNE (Inter-Agency Committee on Radiological and Nuclear Emergencies) of urgent protection actions planning zone (UPZ), in case of a nuclear emergency when no information about the source is available, a vertical cylinder with a radius up to 30km (16nm) around the source of the release may be used in the SIGMET for RDOACT CLD. Phase 2, namely the transport phase, of the proposed "*Initial Guidance*" is not yet agreed and would require further work of the WG-MISD.

2.2 The Panel also reviewed the proposed additions to the template for SIGMET and AIRMET messages (Table A6-1A of Annex 3) to aid in the provision of radioactive cloud information through the SIGMET for RDOACT CLD. The first addition considered allowed for the use of a circle to describe the location of any SIGMET and AIRMET phenomenon, which resulted in a cylinder shaped SIGMET and AIRMET. The second addition proposed was the inclusion of a note in Annex 3, Appendix 6, Table A6-1A stating that when detailed information on the release was not available a radius of up to 30 km may be used in the SIGMET for RDOACT CLD, in addition to a vertical extent from the surface to the upper limit of the applicable airspace. Following the discussion, a recommendation was made to the draft Amendment 78 to Annex 3:

> **Recommendation 4/1 — Draft Amendment 78 to Annex 3/Technical Regulations [C.3.1] concerning the use of a circle (cylinder) in SIGMET messages, including RDOACT CLD**
> That, the proposal to amend Annex 3, Table A6-1A of Appendix 6, to allow the use of a circle (cylinder) for any SIGMET message as well as a note to address the issuance of a RDOACT CLD SIGMET when detailed information on the release is not available, be consolidated with other elements of draft Amendment 78 to Annex 3.

The draft amendment is included as an appendix of this paper.

2.3 WG-MISD also indicated that it would focus the coming intersessional period on the development of the provision of radioactive cloud information based on atmospheric transport and dispersion models (ATDM). This includes the review of regional initiatives that aim to develop and test ATDM-based approaches including criteria and guidance on how to use the information. The goal is to have additional SARPs ready in time for Amendment 79 to Annex 3.

2.4 Given the above, it is proposed that MET/S WG would keep in view the international developments of guidance in the issuance radioactive cloud SIGMET, including the endorsement of Amendment 78 to Annex 3 and the formulation of the guidelines in the use of information from ATDM for the issuance of SIGMET. If appropriate, MET/S WG would provide input to the review of regional initiatives as discussed in para. 2.3 above.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this paper;

b) discuss with way forward with the guidance.

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FCST SWX:	20161108/0100Z HNH HSH E18000 – W18000 ABV FL350
FCST SWX +6 HR:	20121108/0700Z HNH HSH E18000 – W18000 ABV FL350
FCST SWX +12 HR:	20161108/1300Z HNH HSH E18000 – W18000 ABV FL350
FCST SWX +18 HR:	20161108/1900Z HNH HSH E18000 – W18000 ABV FL350
FCST SWX +24 HR:	20161109/0100Z NO SWX EXP
RMK:	RADIATION LEVELS HAVE EXCEEDED 100 PERCENT OF BACKGROUND LEVELS AT FL350 AND ABOVE. THE CURRENT EVENT HAS PEAKED AND LEVELS ARE SLOWLY RETURNING TO BACKGROUND LEVELS. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	NO FURTHER ADVISORIES

Example A2-5: Space weather advisory message (HF COM effects)

(communication header)	
SWX ADVISORY	
DTG:	20161108/0100Z
SWXC:	(to be determined)
SWX EFFECT:	HF COM SEV
ADVISORY NR:	2016/1
OBS SWX:	20161108/0100Z DAYLIGHT SIDE
FCST SWX +6 HR:	20121108/0700Z DAYLIGHT SIDE
FCST SWX +12 HR:	20161108/1300Z DAYLIGHT SIDE
FCST SWX +18 HR:	20161108/1900Z DAYLIGHT SIDE
FCST SWX +24 HR:	20161109/0100Z DAYLIGHT SIDE
RMK:	PERIODIC HF COM ABSORPTION HAS BEEN OBSERVED AND IS LIKELY TO CONTINUE IN THE NEAR TERM. COMPLETE AND PERIODIC LOSS OF HF ON THE SUNLIT SIDE OF THE EARTH EXPECTED. CONTINUED HF COM DEGREDATION LIKELY OVER THE NEXT 7 DAYS. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	20161108/0700Z

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APPENDIX 6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS

(See Chapter 7 of this Annex.)

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Table A6-1A. Template for SIGMET and AIRMET messages

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Element	*Detailed content*	*SIGMET template*	*AIRMET template*	*SIGMET message examples*	*AIRMET message examples*
…	…	…	…	…	…
Location (C)[19]	Location (referring to latitude and longitude (in degrees and minutes))	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn] *or* N OF LINE[20] *or* NE OF LINE[20] *or* E OF LINE[20] *or* SE OF LINE[20] *or* S OF LINE[20] *or* SW OF LINE[20] *or* W OF LINE[20] *or* NW OF LINE[20] 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 LINE[20] *or* NE OF LINE[20] *or* E OF LINE[20] *or* SE OF LINE[20] *or* S OF LINE[20] *or* SW OF LINE[20] *or* W OF LINE[20] *or* NW OF LINE[20] 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]]]		N2020 W07005 N48 E010 S60 W160 S0530 E16530 N OF N50 S OF N5430 N OF S10 S OF S4530 W OF W155 E OF W45 W OF E15540 E OF E09015 N OF N1515 AND W OF E13530 S OF N45 AND N OF N40 N OF LINE S2520 W11510 – S2520 W12010 SW OF LINE N50 W005 – N60 W020 SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550 APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010	

		or WI[20, 21] 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]] *or* APRX nnKM WID LINE[20] BTN (*or* nnNM WID LINE[20] 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* ENTIRE FIR[/UIR] *or* ENTIRE CTA *or*[22] WI nnnKM (*or* nnnNM) OF TC CENTRE *or*[29] WI nnnNM *or* nnnKM OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn(nn)		ENTIRE FIR ENTIRE FIR/UIR ENTIRE CTA WI 400KM OF TC CENTRE WI 250NM OF TC CENTRE WI 30 KM OF N6030 E02550	
…	…	…	…	…	…
Forecast position (C)[19, 24, 25]	Forecast position of phenomenon at the end of the validity period of the SIGMET message	Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] [AND] W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* N OF Nnn[nn] *or* N OF Snn[nn] AND S OF Nnn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* W OF Ennn[nn] AND E OF Wnnn[nn] *or* E OF Ennn[nn] *or* N OF LINE[20] *or* NE OF LINE[20] *or* E OF LINE[20] *or* SE OF LINE[20] *or* S OF LINE[20] *or* SW OF LINE[20] *or* W OF LINE[20] *or* NW OF LINE[20] Nnn[nn] *or*	—	N30 W170 N OF N30 S OF S50 AND W OF E170 S OF N46 AND N OF N39 NE OF LINE N35 W020 – N45 W040 SW OF LINE N48 W020 – N43 E010 AND NE OF LINE N43 W020 – N38 E010 WI N20 W090 – N05 W090 – N10 W100 – N20 W100 – N20 W090 APRX 50KM WID LINE BTN N64 W017 – N57 W005 – N55 E010 – N55 E030 ENTIRE FIR ENTIRE FIR/UIR ENTIRE CTA TC CENTRE PSN N2740 W07345	—

		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 LINE[20] *or* NE OF LINE[20] *or* E OF LINE[20] *or* SE OF LINE[20] *or* S OF LINE[20] *or* SW OF LINE[20] *or* W OF LINE[20] *or* NW OF LINE[20] 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* WI[20, 21] 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 nnKM WID LINE[20] BTN (nnNM WID LINE[20] 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* ENTIRE FIR[/UIR] *or* ENTIRE CTA *or*[22] TC CENTRE PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] *or*[26] NO VA EXP *or*[29]		NO VA EXP WI 30 KM OF N6030 E02550	

		WI nnnNM *or* nnnKM OF Nnn[nn] *or* Snn[nn] Wnnn[nn] or Ennn(nn)			
…	…	…	…	…	…

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Notes.—

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29. When using SIGMET for RDOACT CLD, when detailed information on the release is not available, a radius of up to 30 km may be applied based on the International Atomic Energy Agency (IAEA) recommendation for surface contamination contained in IAEA Safety Guide GS-G-2.1 - *Arrangements for Preparedness for a Nuclear or Radiological Emergency* (2007); 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 as applicable.

APPENDIX 8. TECHNICAL SPECIFICATIONS RELATED TO SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

(See Chapter 9 of this Annex)

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4. SPECIFICATIONS RELATED TO FLIGHT DOCUMENTATION

4.1 Presentation of information

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4.1.3 METAR and SPECI (including trend forecasts as issued in accordance with regional air navigation agreement), TAF, GAMET, SIGMET, AIRMET and space weather, volcanic ash and tropical cyclone advisory information shall be presented in accordance with the templates in Appendices 1, 2, 3, 5 and 6, respectively. Such meteorological information received from other meteorological offices shall be included in flight documentation without change.

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ATTACHMENT E. SPATIAL RANGES AND RESOLUTIONS FOR SPACE WEATHER ADVISORY INFORMATION

Note.— The guidance contained in this table relates to Appendix 2, 6.1 Space weather advisory information.

Element		Range	Resolution
Flight Level:		250-600	30
Longitudes for advisories:	(degrees) (minutes)	000 – 180 00	15 0
Latitude bands for advisories:	High latitudes northern hemisphere (HNH)	N9000 - N6000	30
	Middle latitudes northern hemisphere (MNH)	N6000 - N3000	
	Equatorial latitudes northern hemisphere (EQN)	N3000 - N0000	
	Equatorial latitudes southern hemisphere (EQS)	S0000 - S3000	
	Middle latitudes southern hemisphere (MSH)	S3000 - S6000	