



WORKING PAPER

AIR NAVIGATION COMMISSION

**PRELIMINARY REVIEW OF PROPOSED AMENDMENT TO ANNEX 3 AND
CONSEQUENTIAL AMENDMENTS TO ANNEX 15, PANS-ABC AND PANS-ATM ARISING
FROM THE SECOND MEETING OF THE METEOROLOGY PANEL (METP/2)**

(Item No. 20401)

(Presented by the Director of the Air Navigation Bureau)

SUMMARY

This paper presents proposals arising from the second meeting of the Meteorology Panel (METP/2) to amend Annex 3 — *Meteorological Service for International Air Navigation* in relation to the provision of space weather information, improvements in the provision of SIGMET information, release of radioactive material in the atmosphere, use of “test/exercise” qualifiers in advisories, SIGMET and AIRMET messages related to volcanic ash and tropical cyclones, the extension of the use of ICAO Meteorological Information Exchange Model (IWXXM), competency, education and training of aeronautical meteorological personnel, and consequential amendments to Annex 15 — *Aeronautical Information Services, Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (Doc 8400, PANS-ABC) and *Procedures for Air Navigation Services — Air Traffic Management* (Doc 4444, PANS-ATM).

Action by the Air Navigation Commission is in paragraph 4.

WORK PROGRAMME ELEMENTS

1695, 1696, 1698, 1700, 1705

COORDINATION

AMO, AOI, PBN

REFERENCES

- *Annex 3
- *Annex 15
- *PANS-ABC (Doc 8400)
- *PANS-ATM (Doc 4444)
- *METP/2 Report (*available on the METP secure website at*
<https://portal.icao.int/METP/Pages/METP2-Reports.aspx>)

This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.

*Principal references

1. INTRODUCTION

1.1 The second meeting of the Meteorology Panel (METP/2) was held from 17 to 21 October 2016 at ICAO Headquarters in Montréal. It was attended by fifty-eight members, observers and advisers from seventeen States and six international organizations.

1.2 The METP/2 developed recommendations for a proposed amendment to Annex 3 — *Meteorological Service for International Air Navigation* concerning the provision of space weather information to support international air navigation, improvements in the provision of SIGMET information by meteorological watch offices (MWOs), the release of radioactive material in the atmosphere, use of “test/exercise” qualifiers in advisories, SIGMET and AIRMET messages related to volcanic ash and tropical cyclones, the extension of the use of ICAO Meteorological Information Exchange Model (IWXXM) in accordance with the GANP and alignment of the ICAO/World Meteorological Organization (WMO) provisions regarding competency, education and training of aeronautical meteorological personnel.

1.3 The METP/2 also developed consequential amendments to Annex 15, PANS-ABC and PANS-ATM.

2. DISCUSSION

2.1 Introduction of Space Weather Advisory Information Service

2.1.1 Appendix A (Initial Proposal 1) contains proposals to amend Annex 3 for the introduction of a space weather information service supporting international air navigation. The suggested introduction of these new SARPs is the culmination of a process initiated by Recommendation 1/20 c) of the Meteorology (MET) Divisional Meeting (Montréal, 9 to 27 September 2002) which requested the evaluation of the need to provide information for international air navigation, inter alia, on solar radiation storms. Subsequently, ICAO and WMO worked closely together over the years in maturing a proposal for a new requirement. In December 2011, IATA confirmed a high-level user requirement for information on space weather. Initial Proposal 1 was developed as a follow up to Recommendation 2/7 of the Meteorology (MET) Divisional Meeting (Montréal, 7 to 18 July 2014). The space weather proposals are consistent with the *Global Air Navigation Plan* (GANP) (Doc 9750) and are supported by a process for the assessment of prospective providers of space weather information, the establishment of providers and the further development of higher resolution information over time. (METP/2 Report, Agenda Item 4.2, Recommendations 4/3 to 4/6 inclusive refer).

2.1.2 Appendix B (Initial Proposal 1) contains consequential proposals to amend Annex 15 provisions by introducing an expansion in the scope in NOTAM to include information on space weather events. (METP/2 Report, Agenda Item 4.2, Recommendations 4/3 to 4/6 inclusive refer).

2.1.3 Appendix C (Initial Proposal 1) contains consequential proposals to amend PANS-ABC (Doc 8400) provisions by introducing abbreviations relating to space weather events and space weather information providers. (METP/2 Report, Agenda Item 4.2, Recommendations 4/3 to 4/6 inclusive refer).

2.1.4 The proposed amendment as detailed in Appendix D (Initial Proposal 1) contains consequential proposals to amend PANS-ATM (Doc 4444) relating to the transmission of space weather information as part of a flight information service, and removes the current perspective that only supersonic operations are affected. (METP/2 Report, Agenda Item 4.2, Recommendations 4/3 to 4/6 inclusive refer).

2.2 Improvement of the provision of SIGMET information by meteorological watch offices (MWOs)

2.2.1 Appendix A (Initial Proposal 2) adds a note to Annex 3, Chapter 3, 3.4.1, regarding the guidance to meteorological watch offices in bilateral and multilateral cooperation and coordination for the provision of SIGMET information messages to address user needs for better harmonization of the provision of en-route hazardous weather information. (METP/2 Report, Agenda Item 4.4, Recommendation 4/9 refers).

2.3 Information on the release of radioactive material into the atmosphere

2.3.1 Appendix A (Initial Proposal 3) contains provisions to amend Annex 3 to allow for the provision of SIGMET and AIRMET messages to contain a cylindrical description of the airspace affected. The proposed provision has an associated note to aid meteorological watch offices in the provision of the SIGMET messages for a radioactive cloud considering the recommendations of the International Atomic Energy Agency (IAEA). (METP/2 Report, Agenda Item 4.1, Recommendation 4/1 and 4/2 refers). Further enhancements to the provision of information for the release of radioactive material into the atmosphere are under consideration by the METP.

2.4 SIGMET and AIRMET information

2.4.1 Appendix A (Initial Proposal 4) contains proposals to amend Annex 3 that would enable the use of 'TEST' or 'EXERCISE' qualifiers in test messages for volcanic ash and tropical cyclone advisory as well as in SIGMET and AIRMET information. These provisions would remove the potential for ambiguity that may arise between operational messages and those messages issued during communications tests (e.g. TEST) or volcanic ash and tropical cyclone contingency exercises (e.g. EXERCISE). (METP/2 Report, Agenda Item 5, Recommendation 5/6 refers).

2.4.2 Appendix A (Initial Proposal 6) contains proposals to amend Annex 3 that would enable greater clarity in the presentation of information about tropical cyclones (TC) (Annex 3, Table A2-2 Template for advisory message for tropical cyclones) with regard to their advisory number, observation time, TC centre position, and associated observed cumulonimbus (CB) cloud. These proposals are reflected in proposals for related changes in SIGMET information (Annex 3, Table A6-1A Template for SIGMET and AIRMET messages) as well as with the remediation of missing cloud level utility and area description with reference to FIR and UIR. (METP/2 Report, Agenda Item 8, Recommendation 8/2 refers).

2.5 Introduction of IWXXM

2.5.1 Appendix A (Initial Proposal 5) contains provisions to amend Annex 3 that extend the use of the ICAO Meteorological Information Exchange Model (IWXXM) to facilitate the exchange of meteorological observations and reports (METAR/SPECI), aerodrome forecasts (TAF), SIGMETs, AIRMETs, and volcanic ash and tropical cyclone advisory information, in a system wide information management (SWIM) compliant environment. The current provisions allow those States with the capability to begin using IWXXM to exchange meteorological information in such a manner. From November 2020, the exchange of information in IWXXM format (in addition to the traditional

alphanumeric code) is proposed to become a Standard and the primary means for the exchange of international MET information¹. (METP/2 Report, Agenda Item 5.7, Recommendation 5/8 refers).

2.6 Aeronautical meteorological personnel qualification and competency, education and training

2.6.1 Appendix A (Initial Proposal 7) contains proposals to amend Annex 3 that would provide greater clarity with regard to the qualification and competency, education and training of personnel engaged in the provision of meteorological service for international air navigation (i.e. aeronautical meteorological personnel). The proposal brings the ICAO provisions in line with the requirements of the World Meteorological Organization (WMO) in this regard. (METP/2 Report, Agenda Item 8.2, Recommendation 8/3 refers).

3. IMPACT ASSESSMENT

3.1 The impact assessment for the proposed amendment is contained in Appendix E to this paper.

4. ACTION BY THE AIR NAVIGATION COMMISSION

4.1 The Air Navigation Commission is invited to:

- a) review the proposals for amendment to Annex 3 and the consequential amendments to Annex 15, PANS-ABC and PANS-ATM as contained in Appendices A to D, respectively;
- b) note the information regarding the impact assessment as contained in Appendix E;
- c) agree that the proposed amendments, as may be modified by the action in a) above, be transmitted to Member States and appropriate international organizations for comments;
- d) agree that the applicability date for the proposed amendment to Annex 3 be indicated as 8 November 2018 except for the provisions related to modifications of IWXXM representations of information which should be indicated as 7 November 2019 and those that pertain to the IWXXM as a standard practice which should be indicated as 5 November 2020;

¹ The IWXXM timeline is:

1. 2016-2018: TAC is a Standard, IWXXM is a Recommended Practice for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET;
2. 2018: TAC is a Standard, IWXXM is a Recommended Practice for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET, Space Weather;
3. 2020: TAC is a Standard, IWXXM is a Standard for METAR/SPECI/Trend, TAF, VAA, TCA, SIGMET, AIRMET, Space Weather.

- e) agree that the applicability date for the proposed amendments to Annex 15, PANS-ABC and PANS-ATM be indicated as 8 November 2018; and
- f) request the Secretary to present the results of the consultation in c) above for final review by the Air Navigation Commission in the 206th Session.

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APPENDIX A

PROPOSED AMENDMENT TO ANNEX 3

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

~~Text to be deleted is shown with a line through it.~~

text to be deleted

New text to be inserted is highlighted with grey shading.

new text to be inserted

~~Text to be deleted is shown with a line through it followed~~
by the replacement text which is highlighted with grey
shading.

new text to replace existing text

PROPOSED AMENDMENT TO
ANNEX 3 — *METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION*

INITIAL PROPOSAL 1
**INTRODUCTION OF A SPACE WEATHER INFORMATION SERVICE SUPPORTING
INTERNATIONAL AIR NAVIGATION (ANNEX 3)**

PART I. CORE SARPs

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CHAPTER 1. DEFINITIONS

1.1 Definitions

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Space weather centre (SWXC). A centre designated to monitor and provide information on space weather expected to affect communications, GNSS-based navigation and surveillance systems and/or pose a radiation risk to flight crew members and passengers.

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**CHAPTER 3. WORLD AREA FORECAST SYSTEM AND,
METEOROLOGICAL OFFICES AND OTHER CENTRES**

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3.8 Space weather centre (SWXC)

3.8.1 A Contracting State, having accepted the responsibility for providing a SWXC, shall arrange for that centre to provide information on space weather that is expected to affect communications and navigation systems and/or pose a radiation risk to flight crew members and passengers in its area of responsibility by arranging for that centre to:

- a) monitor relevant ground-based, airborne and space-based observations to detect, and predict when possible, the existence and extent of space weather conditions that have an impact in the following areas:
 - 1) high frequency (HF) radio communications;
 - 2) GNSS-based navigation and surveillance; and

- 3) radiation exposure at flight levels;
- b) issue advisory information regarding the extent, severity and duration of the space weather phenomena that have an impact referred to in a);
- c) supply space weather information referred to in b) to:
 - 1) area control centres, flight information centres and aerodrome meteorological offices serving flight information regions in its area of responsibility which may be affected;
 - 2) other SWXCs; and
 - 3) international OPMET databanks, international NOTAM offices and aeronautical fixed service Internet-based services.

3.8.2 SWXC shall maintain a 24-hour watch.

3.8.3 In case of interruption of the operation of a SWXC, its functions shall be carried out by another SWXC or another centre, as designated by the SWXC Provider State concerned.

Note.— Guidance on the provision of space weather information, including the ICAO-designated provider(s) of space weather information, is provided in the Manual on Space Weather in Support of International Air Navigation (Doc #####).

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CHAPTER 9. SERVICE FOR OPERATORS AND FLIGHT CREW MEMBERS

9.1 General provisions

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9.1.3 Meteorological information supplied to operators and flight crew members shall be up to date and include the following information, as agreed between the meteorological authority and the operators concerned:

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- i) meteorological satellite images; and
- j) ground-based weather radar information; and
- k) space weather information relevant to the intended route including aerodromes of departure, intended landing and alternate destination.

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9.3 Flight documentation

Note.— The requirements for the use of automated pre-flight information systems in providing flight documentation are given in 9.4.

9.3.1 Flight documentation to be made available shall comprise information listed under 9.1.3 a) 1) and 6), b), c), e), f) and, if appropriate, g) and k). However, flight documentation for flights of two hours' duration or less, after a short stop or turnaround, shall be limited to the information operationally needed, as agreed between the meteorological authority and the operator concerned, but in all cases it shall at least comprise information on 9.1.3 b), c), e), f) and, if appropriate, g) and k).

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PART II. APPENDICES AND ATTACHMENTS

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APPENDIX 2. TECHNICAL SPECIFICATIONS RELATED TO WORLD AREA FORECAST SYSTEM, AND METEOROLOGICAL OFFICES AND OTHER CENTRES

(See Chapter 3 of this Annex)

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6. SPACE WEATHER CENTRES

6.1 Space weather advisory information

6.1.1 Recommendation.— *Advisory information on space weather should be issued in abbreviated plain language, using approved ICAO abbreviations and numerical values of self-explanatory nature, and should be in accordance with the templates shown in Table A2-3. When no approved ICAO abbreviations are available, English plain language text, to be kept to a minimum, shall be used.*

6.1.2 Recommendation.— *Until 5 November 2020, space weather advisory information should be available in IWXXM GML form, in addition to the dissemination of space weather advisory information in abbreviated plain language in accordance with 6.1.1.*

6.1.3 From 5 November 2020, space weather advisory information shall be disseminated in IWXXM GML form, in addition to the issuance of this advisory information in abbreviated plain language in accordance with 6.1.1.

Note.— Guidance on IWXXM is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (Doc 10003).

6.1.4 Recommendation.— *One or more of the following space weather effects should be included in the space weather advisory information, using their respective abbreviations as indicated below:*

- HF communication (propagation, absorption) **HF COM**

- GNSS-based navigation and surveillance (degradation) **GNSS**

- Radiation at flight levels (increased exposure) **RADIATION**

6.1.5 Recommendation.— *The following intensities should be included in space weather advisory information, using their respective abbreviations as indicated below:*

- moderate **MOD**

- severe **SEV**

6.1.6 Recommendation.— *Updated advisory information should be issued as necessary but at least every six hours.*

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Insert new Table A2-3 as follows:

Table A2-3. Template for advisory message for space weather information

Key: M = inclusion mandatory, part of every message
O = inclusion optional

Note 1.— The explanations for the abbreviations can be found in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 2.— The spatial resolutions are shown in Attachment E.

Element	Detailed content	Template(s)	Examples
1 Identification of the type of message (M)	Type of message	SWX ADVISORY	SWX ADVISORY
2 TEST or EXERCISE indicator (C)*	TEST or EXERCISE indicator (C)*	Indicator of TEST or EXERCISE	TEST or EXERCISE
3 Time of origin (M)	Year, month, day, time in UTC	DTG: nnnnnnnn/nnnnZ	DTG: 20161108/0100Z
4 Name of centre (M)	Name of SWXC	SWXC: nnnnnnnnnnn	SWXC: <TBD>
5 Advisory number (M)	Number with year in full and unique message number	ADVISORY NR: nnnn/[n][n][n]	ADVISORY NR: 2016/1
6 Space weather effect and intensity	Kind of effect and intensity from the space weather event (HF communication, GNSS navigation and surveillance, radiation level exposure environment)	SWX EFFECT: HF COM MOD or SEV, or GNSS MOD or SEV, or HF COM MOD or SEV AND GNSS MOD or SEV, or RADIATION ¹ MOD or SEV	SWX EFFECT: HF COM MOD GNSS SEV HF COM MOD AND GNSS MOD RADIATION MOD

Element		Detailed content	Template(s)	Examples
7	Observed or expected extent of space weather event (M)	<p>Specify time: year, month, day, time in UTC (time T)</p> <p>Observed (or forecast if event has yet to occur) space weather horizontal extent (latitude bands and longitude in degrees) and/or altitude at time T.</p>	<p>OBS or FCST SWX:</p> <p>nnnnnnnn/nnnnZ</p> <p>DAYLIGHT SIDE</p> <p>and/or</p> <p>HNH and/or MNH and/or EQN and/or EQS and/or MSH and/or HSH</p> <p>Wnnn(nn) or Ennn(nn) – Wnnn(nn) or Ennn(nn)</p> <p>and/or</p> <p>ABV FLnnn or FLnnn–nnn</p> <p>or</p> <p>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]</p> <p>or</p> <p>NO SWX EXP</p>	<p>OBS SWX:</p> <p>FCST SWX:</p> <p>20161108/0100Z</p> <p>DAYLIGHT SIDE</p> <p>HNH HSH</p> <p>HNH MNH MSH HSH</p> <p>EQN EQS</p> <p>W18000 – W09000</p> <p>ABV FL350</p> <p>S3000 E09000 – S3000 E18000 – S4000 E18000 – S4000 E09000</p> <p>NO SWX EXP</p>
8	Forecast for the next 6 hours (M)	<p>Day and time (in UTC) (6 hours from time given in item 6, rounded to the next full hour)</p> <p>Forecast extent and/or altitude for the fixed valid time.</p>	<p>FCST SWX +6 HR:</p> <p>nn/nnnnZ</p> <p>DAYLIGHT SIDE</p> <p>and/or</p> <p>HNH and/or MNH and/or EQN and/or EQS and/or MSH and/or HSH</p> <p>and/or</p> <p>Wnnn(nn) or Ennn(nn) – Wnnn(nn) or Ennn(nn)</p> <p>and/or</p> <p>ABV FLnnn or FLnnn–nnn</p> <p>or</p>	<p>FCST SWX +6 HR:</p> <p>20161108/0700Z</p> <p>DAYLIGHT SIDE</p> <p>HNH HSH</p> <p>HNH MNH MSH HSH</p> <p>EQN EQS</p> <p>W09000 – W00000</p> <p>ABV FL350</p> <p>S3000 E09000 – S3000 E18000 – S4000 E18000 – S4000 E09000</p> <p>NO SWX EXP</p> <p>NOT AVBL</p>

Element		Detailed content	Template(s)	Examples
			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 NO SWX EXP or NOT AVBL	
9	Forecast for the next 12 hours (M)	Day and time (in UTC) (12 hours from time of onset given in item 6, rounded to the next full hour) Forecast extent and/or altitude for the fixed valid time.	FCST SWX +12 HR: nn/nnnnZ DAYLIGHT SIDE or HNH and/or MNH and/or EQN and/or EQS and/or MSH and/or HSH and/or Wnnn(nn) or Ennn(nn) – Wnnn(nn) or Ennn(nn) and/or ABV FLnnn or FLnnn–nnn or 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 NO SWX EXP or NOT AVBL	FCST SWX +12 HR: 20161108/1300Z DAYLIGHT SIDE HNH HSH HNH MNH MSH HSH EQN EQS E00000 – E09000 ABV FL350 S3000 E09000 – S3000 E18000 – S4000 E18000 – S4000 E09000 NO SWX EXP NOT AVBL
10	Forecast for the next 18 hours (M)	Day and time (in UTC) (18 hours from time of onset given in item 6, rounded to the next full hour) Forecast extent and/or altitude for the fixed valid time.	FCST SWX +18 HR: nn/nnnnZ DAYLIGHT SIDE or HNH and/or	FCST SWX +18 HR: 20161108/1900Z DAYLIGHT SIDE HNH HSH HNH

Element		Detailed content	Template(s)	Examples
			MNH <i>and/or</i> EQN <i>and/or</i> EQS <i>and/or</i> MSH <i>and/or</i> HSH <i>and/or</i> Wnnn(nn) <i>or</i> Ennn(nn) – Wnnn(nn) <i>or</i> Ennn(nn) <i>and/or</i> ABV FLnnn <i>or</i> FLnnn–nnn <i>or</i> Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – [Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] <i>or</i> NO SWX EXP <i>or</i> NOT AVBL	MNH MSH HSH EQN EQS E09000 – E18000 ABV FL350 S3000 E09000 – S3000 E18000 – S4000 E18000 – S4000 E09000 NO SWX EXP NOT AVBL
11	Forecast for the next 24 hours (M)	Day and time (in UTC) (24 hours from time of onset given in item 6, rounded to the next full hour) Forecast extent and/or altitude for the fixed valid time.	FCST SWX +24 HR: nn/nnnnZ DAYLIGHT SIDE <i>or</i> HNH <i>and/or</i> MNH <i>and/or</i> EQN <i>and/or</i> EQS <i>and/or</i> MSH <i>and/or</i> HSH <i>and/or</i> Wnnn(nn) <i>or</i> Ennn(nn) – Wnnn(nn) <i>or</i> Ennn(nn) <i>and/or</i> ABV FLnnn <i>or</i> FLnnn–nnn <i>or</i> Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] – Nnn[nn] <i>or</i> Snn[nn] Wnnn[nn] <i>or</i> Ennn[nn] –	FCST SWX +24 HR: 20161109/0100Z DAYLIGHT SIDE HNH HSH HNH MNH MSH HSH EQN EQS W18000 – W09000 ABV FL350 S3000 E09000 – S3000 E18000 – S4000 E18000 – S4000 E09000 NO SWX EXP NOT AVBL

Element		Detailed content	Template(s)	Examples
			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 NO SWX EXP or NOT AVBL	
12	Remarks (M)	Remarks, as necessary.	RMK: Free text up to 256 characters.	RMK: SWX EVENT HAS CEASED RMK: WWW.SPACEWEATHERPROVIDER.GOV RMK: NIL
13	Next advisory (M)	Year, month, day, time in UTC.	NXT ADVISORY: nnnnnnnn/nnnnZ or Free text up to XX (TBD) characters or NO FURTHER ADVISORIES	NXT ADVISORY: 20161108/0700Z. NO FURTHER ADVISORIES

* Use only when the message issued is a TEST or EXERCISE and is not to be used for operational decision-making. When TEST or EXERCISE is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".

Example A2-3: Space weather advisory message (GNSS and HF COM effects)

(communication header)	
SWX ADVISORY	
DTG:	20161108/0100Z
SWXC:	(to be determined)
SWX EFFECT:	GNSS MOD AND HF COM MOD
ADVISORY NR:	2016/1
OBS SWX:	20161108/0100Z HNH HSH E18000 – W18000
FCST SWX +6 HR:	20121108/0700Z HNH HSH E18000 – W18000
FCST SWX +12 HR:	20161108/1300Z HNH HSH E18000 – W18000
FCST SWX +18 HR:	20161108/1900Z HNH HSH E18000 – W18000
FCST SWX +24 HR:	20161109/0100Z NO SWX EXP
RMK:	LOW-LEVEL GEOMAGNETIC STORMING IS CAUSING INCREASED AURORAL ACTIVITY AND SUBSEQUENT MOD DEGRADATION OF GNSS ACCURACY AND HF COM AVAILABILITY IN THE AURORAL ZONE. THIS STORMING IS EXPECTED TO SUBSIDE IN THE FORECAST PERIOD. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	NO FURTHER ADVISORIES

Example A2-4: Space weather advisory message (RADIATION effects)

(communication header)	
SWX ADVISORY	
DTG:	20161108/0000Z
SWXC:	(to be determined)
SWX EFFECT:	RADIATION MOD
ADVISORY NR:	2016/2

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 DEGRADATION LIKELY OVER THE NEXT 7 DAYS. SEE WWW.SPACEWEATHERPROVIDER.WEB
NXT ADVISORY:	20161108/0700Z

End of new Table A2-3.

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

...

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

...

Insert new Attachment E as follows.

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	
	High latitudes southern hemisphere (HSH)	S6000 - S9000	

Note.— One or more latitude ranges should be included in the space weather advisory information for GNSS and RADIATION.

End of new Attachment E.

Origin	Rationale
METP/2	This amendment has been introduced to support the initial implementation of the provision of space weather advisory information to enhance the safety and efficiency of international air navigation consistent with the Global Air Navigation Plan. The provision of this information would include advisories for space weather events affecting, or expected to affect, communications, GNSS-based navigation and surveillance systems, and which could pose a radiation risk to flight crew members and passengers within the next 24 hours.

<p style="text-align: center;">INITIAL PROPOSAL 2</p> <p style="text-align: center;">IMPROVEMENT OF THE PROVISION OF SIGMET INFORMATION BY METEOROLOGICAL WATCH OFFICES (MWOS). (ANNEX 3)</p>

PART I. CORE SARPs

...

**CHAPTER 3. WORLD AREA FORECAST SYSTEM-AND,
METEOROLOGICAL OFFICES AND OTHER CENTRES**

...

3.4 Meteorological watch offices

3.4.1 A Contracting State, having accepted the responsibility for providing air traffic services within a flight information region (FIR) or a control area (CTA), shall establish, in accordance with regional air navigation agreement, one or more MWOs, or arrange for another Contracting State to do so.

Note.— Guidance on the arrangements between Contracting States for the provision of meteorological watch office services can be found in the Manual of Aeronautical Meteorological Practice (Doc 8896).

Origin	Rationale
METP/2	The introduction of this proposal for a Note is needed to point to additional guidance material to be developed to support bilateral and multilateral cooperation and coordination of the issuance of SIGMET information before the introduction of the regional advisory system for select en-route hazardous meteorological conditions.

INITIAL PROPOSAL 3**SIGMET INFORMATION ON THE RELEASE OF RADIOACTIVE MATERIAL INTO THE ATMOSPHERE. (ANNEX 3)****(APPLICABILITY DATE: NOVEMBER 2019)****APPENDIX 6. TECHNICAL SPECIFICATIONS RELATED TO SIGMET AND AIRMET INFORMATION, AERODROME WARNINGS AND WIND SHEAR WARNINGS AND ALERTS***(See Chapter 7 of this Annex.)*

...

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

...

<i>Element</i>	<i>Detailed content</i>	<i>SIGMET template</i>	<i>AIRMET template</i>	<i>SIGMET message examples</i>	<i>AIRMET message examples</i>
...
Location (C) ¹⁹	Location (referring to latitude and longitude (in degrees and minutes))	<p>Nnn[nn] Wnnn[nn] or Nnn[nn] Ennn[nn] or Snn[nn] Wnnn[nn] or Snn[nn] Ennn[nn]</p> <p>or</p> <p>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]</p> <p>or</p> <p>N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF Snn[nn]</p> <p>or</p> <p>W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn] or E OF Ennn[nn]</p> <p>or</p> <p>N OF LINE²⁰ or NE OF LINE²⁰ or E OF LINE²⁰ or SE OF LINE²⁰ or S OF LINE²⁰ or SW OF LINE²⁰ or W OF LINE²⁰ or NW OF LINE²⁰ 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 LINE²⁰ or NE OF LINE²⁰ or E OF LINE²⁰ or SE OF LINE²⁰ or S OF LINE²⁰ or SW OF LINE²⁰ or W OF LINE²⁰ or NW OF LINE²⁰ 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]]]</p>		<p>N2020 W07005 N48 E010 S60 W160 S0530 E16530</p> <p>N OF N50 S OF N5430 N OF S10 S OF S4530 W OF W155 E OF W45 W OF E15540 E OF E09015</p> <p>N OF N1515 AND W OF E13530 S OF N45 AND N OF N40</p> <p>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</p> <p>WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550</p> <p>APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010</p>	

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>or</p> <p>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]]</p> <p>or</p> <p>APRX nnKM WID LINE²⁰ BTN (or nnNM WID LINE²⁰ 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]]</p> <p>or</p> <p>ENTIRE FIR/UIR]</p> <p>or</p> <p>ENTIRE CTA</p> <p>or²²</p> <p>WI nnnKM (or nnnNM) OF TC CENTRE</p> <p>or²⁹</p> <p>WI nnnNM or nnnKM OF Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]</p>		<p>ENTIRE FIR</p> <p>ENTIRE FIR/UIR</p> <p>ENTIRE CTA</p> <p>WI 400KM OF TC CENTRE</p> <p>WI 250NM OF TC CENTRE</p> <p>WI 30 KM OF N6030 E02550</p>	
...
Forecast position (C) ^{19, 24, 25}	Forecast position of phenomenon at the end of the validity period of the SIGMET message	<p>Nnn[nn] Wnnn[nn] or Nnn[nn] Ennn[nn] or Snn[nn] Wnnn[nn] or Snn[nn] Ennn[nn]</p> <p>or</p> <p>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]</p> <p>or</p> <p>N OF Nnn[nn] or N OF Snn[nn] AND S OF Nnn[nn] or S OF Snn[nn]</p> <p>or</p> <p>W OF Wnnn[nn] or W OF Ennn[nn] AND E OF Wnnn[nn] or E OF Ennn[nn]</p> <p>or</p> <p>N OF LINE²⁰ or NE OF LINE²⁰ or E OF LINE²⁰ or SE OF LINE²⁰ or S OF LINE²⁰ or SW OF LINE²⁰ or W OF LINE²⁰ or NW OF LINE²⁰ Nnn[nn] or</p>	—	<p>N30 W170</p> <p>N OF N30</p> <p>S OF S50 AND W OF E170</p> <p>S OF N46 AND N OF N39</p> <p>NE OF LINE N35 W020 – N45 W040</p> <p>SW OF LINE N48 W020 – N43 E010 AND NE OF LINE N43 W020 – N38 E010</p> <p>WI N20 W090 – N05 W090 – N10 W100 – N20 W100 – N20 W090</p> <p>APRX 50KM WID LINE BTN N64 W017 – N57 W005 – N55 E010 – N55 E030</p> <p>ENTIRE FIR</p> <p>ENTIRE FIR/UIR</p> <p>ENTIRE CTA</p> <p>TC CENTRE PSN N2740 W07345</p>	—

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>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 LINE²⁰ or NE OF LINE²⁰ or E OF LINE²⁰ or SE OF LINE²⁰ or S OF LINE²⁰ or SW OF LINE²⁰ or W OF LINE²⁰ or NW OF LINE²⁰ 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 Wl^{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 LINE²⁰ BTN (nnNM WID LINE²⁰ 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 or²² TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] or²⁶ NO VA EXP</p>		<p>NO VA EXP</p> <p>WI 30 KM OF N6030 E02550</p>	

<i>Element</i>	<i>Detailed content</i>	<i>SIGMET template</i>	<i>AIRMET template</i>	<i>SIGMET message examples</i>	<i>AIRMET message examples</i>
		²⁹ WI nnnNM or nnnKM OF Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn(nn)			
...

Notes.—

...

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.

...

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to support the standardization of the description of airspace affected by a release of radioactive material into the atmosphere by allowing the production of SIGMETs and AIRMETs in a vertical cylinder and when detailed information on the release is not available by allowing the use of a 30 km radius consistent with recommendations from the International Atomic Energy Agency.

INITIAL PROPOSAL 4**USE OF 'TEST' OR 'EXERCISE' QUALIFIERS IN TEST MESSAGES FOR VOLCANIC ASH
AND TROPICAL CYCLONE ADVISORY AS WELL AS IN SIGMET AND AIRMET
INFORMATION. (ANNEX 3)****(APPLICABILITY DATE: NOVEMBER 2019)**

...

**APPENDIX 2. TECHNICAL SPECIFICATIONS RELATED
TO WORLD AREA FORECAST SYSTEM,
AND METEOROLOGICAL OFFICES AND OTHER CENTRES***(See Chapter 3 of this Annex)*

...

Table A2-1 Template for Advisory message for volcanic ash

...

<i>Element</i>	<i>Detailed content</i>	<i>Template(s)</i>	<i>Examples</i>
1	Identification of the type of message (M)	Type of message	VA ADVISORY
2	TEST or EXERCISE indicator (C)*	Indicator of TEST or EXERCISE	TEST or EXERCISE
23	Time of origin (M)	Year, month, day, time in UTC	DTG: nnnnnnnn/nnnnZ
34	Name of VAAC (M)	Name of VAAC	VAAC: nnnnnnnnnnnn
45	Name of volcano (M)	Name and IAVCEI ¹ number of volcano	VOLCANO: nnnnnnnnnnnnnnnnnnnnn [nnnnnn] or UNKNOWN or UNNAMED

Notes.—

...

* Use only when the message issued is a TEST or EXERCISE and is not to be used for operational decision-making. When TEST or EXERCISE is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".

Table A2-2. Template for advisory message for tropical cyclones

Element	Detailed content	Template(s)	Examples
1	Identification of the type of message	Type of message	TC ADVISORY
2	TEST or EXERCISE indicator (C) ¹	Indicator of TEST or EXERCISE TEST or EXERCISE	TEST or EXERCISE indicator (C) ¹ TEST or EXERCISE indicator (C) ¹
23	Time of origin	Year, month, day and time in UTC of issue	DTG: nnnnnnnn/nnnnZ DTG: 20040925/19600Z
34	Name of TCAC	Name of TCAC (location indicator or full name)	TCAC: nnnn or nnnnnnnnnn TCAC: YUFO ^{1,2} TCAC: MIAMI
45	Name of tropical cyclone	Name of tropical cyclone or "NN" for unnamed tropical cyclone	TC: nnnnnnnnnnnn or NN TC: GLORIA

Notes.—

1. Use only when the message issued is a TEST or EXERCISE and is not to be used for operational decision-making. When TEST or EXERCISE is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".
- 1.2. Fictitious location.

...

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

(See Chapter 7 of this Annex.)

...

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

...

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
...
Name of the FIR/CTA (M)	Location indicator and name of the FIR/CTA ⁴ for which the SIGMET/AIRMET is issued	nnnn nnnnnnnnnn FIR/[UIR] or nnnn nnnnnnnnnn CTA	nnnn nnnnnnnnnn FIR/[n]	YUCC AMSWELL FIR ² YUDD SHANLON ² FIR/UIR ² YUDD SHANLON CTA ²	YUCC AMSWELL FIR/2 ² YUDD SHANLON FIR ²
IF THE SIGMET OR AIRMET MESSAGE IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.					
TEST or EXERCISE indicator (O)*	Indicator of TEST or EXERCISE	TEST or EXERCISE	TEST or EXERCISE	TEST EXERCISE	TEST EXERCISE
Phenomenon (M) ⁵	Description of	OBSC ⁶ TS[GR ⁷]	SFC WIND nnn/nn[n]MPS	OBSC TS	SFC WIND 040/40MPS

<i>Element</i>	<i>Detailed content</i>	<i>SIGMET template</i>	<i>AIRMET template</i>	<i>SIGMET message examples</i>	<i>AIRMET message examples</i>
	phenomenon causing the issuance of SIGMET/AIRMET	EMBD ⁸ TS[GR ⁷] FRQ ⁹ TS[GR ⁷] SQL ¹⁰ TS[GR ⁷] TC nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB or TC NN ¹¹ PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB 	(or SFC WIND nnn/nn[n]KT) SFC VIS nnnnM (nn) ¹⁵ ISOL ¹⁶ TS[GR ⁷] OCNL ¹⁷ TS[GR ⁷] MT OBSC 	OBSC TSGR EMBD TS EMBD TSGR FRQ TS FRQ TSGR SQL TS SQL TSGR TC GLORIA PSN N10 W060 CB TC NN PSN S2030 E06030 CB 	SFC WIND 310/20KT SFC VIS 1500M (BR) ISOL TS ISOL TSGR OCNL TS OCNL TSGR MT OBSC
...

Notes.—

. . .

* Use only when the message issued is a TEST or EXERCISE and is not to be used for operational decision-making. When TEST or EXERCISE is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to support the inclusion of a clear data line in volcanic ash and tropical cyclone advisories and related SIGMETs to denote those that are issued as part of tests or exercises. This change is necessary to clarify for both users and producers when volcanic ash and tropical cyclone advisories are for test or exercise purposes.

INITIAL PROPOSAL 5

ICAO METEOROLOGICAL INFORMATION EXCHANGE MODEL (IWXXM). (ANNEX 3)

PART I. CORE SARPs

...

CHAPTER 1. DEFINITIONS

1.1 Definitions

...

ICAO meteorological information exchange model (IWXXM). A data model for representing aeronautical meteorological information.

...

PART II. APPENDICES AND ATTACHMENTS

...

APPENDIX 2. TECHNICAL SPECIFICATIONS RELATED TO WORLD AREA FORECAST SYSTEM, AND METEOROLOGICAL OFFICES AND OTHER CENTRES

(See Chapter 3 of this Annex)

3. VOLCANIC ASH ADVISORY CENTRES

3.1 Volcanic Ash Advisory Information

...

3.1.2 **Recommendation.**—*Until 5 November 2020, Volcanic ash advisory centres (VAACs) should issue volcanic ash advisory information should be disseminated in digital IWXXM GML form in addition to the issuance of this advisory information in abbreviated plain language in accordance with 3.1.1.*

3.1.3 *Volcanic ash advisory information, if disseminated in digital form, shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML). From 5 November 2020, volcanic ash advisory information shall be disseminated in IWXXM GML form in addition to the issuance of this advisory information in accordance with 3.1.1.*

3.1.4 *Volcanic ash advisory information, if disseminated in digital form, shall be accompanied by the appropriate metadata.*

Note.— Guidance on the information exchange model IWXXM, XML/GML and the metadata profile is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

...

5. TROPICAL CYCLONE ADVISORY CENTRES

5.1 Tropical Cyclone Advisory Centres

...

5.1.3 **Recommendation.**— *Until 5 November 2020, Tropical cyclone advisory centres should issue tropical cyclone advisory information should be disseminated in digital IWXXM GML form in addition to the issuance of this advisory information in abbreviated plain language in accordance with 5.1.2.*

5.1.4 Tropical cyclone advisory information, if disseminated in digital form, shall be formatted in accordance with a globally interoperable information exchange model and shall use XML/GML. From 5 November 2020, tropical cyclone advisory centres shall issue tropical cyclone advisory information in IWXXM GML form in addition to the issuance of this advisory information in abbreviated plain language in accordance with 5.1.2.

5.1.5 Tropical cyclone advisory information, if disseminated in digital form, shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model IWXXM, XML/GML and the metadata profile is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (Doc 10003).

...

APPENDIX 3. TECHNICAL SPECIFICATIONS RELATED TO METEOROLOGICAL OBSERVATIONS AND REPORTS

(See Chapter 4 of this Annex)

...

2. GENERAL CRITERIA RELATED TO METEOROLOGICAL REPORTS

2.1 Format of meteorological reports

...

2.1.3 **Recommendation.**— *Until 5 November 2020, METAR and SPECI should be disseminated in digital IWXXM GML form in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.*

2.1.4 ~~METAR and SPECI if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).~~ From 5 November 2020, METAR and SPECI shall be disseminated in IWXXM GML form in addition to the dissemination of the METAR and SPECI in accordance with 2.1.2.

2.1.5 ~~METAR and SPECI if disseminated in digital form shall be accompanied by the appropriate metadata.~~

Note.— Guidance on ~~the information exchange model IWXXM, XML/GML and the metadata profile~~ is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

...

APPENDIX 5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS

(See Chapter 6 of this Annex)

1. CRITERIA RELATED TO TAF

1.1 TAF format

...

1.1.2 **Recommendation.**— ~~Until 5 November 2020, TAF should be disseminated in digital IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.~~

1.1.3 ~~TAF if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).~~ From 5 November 2020, TAF shall be disseminated in IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.

1.1.4 ~~TAF if disseminated in digital form shall be accompanied by the appropriate metadata.~~

Note.— Guidance on ~~the information exchange model IWXXM, XML/GML and the metadata profile~~ is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

...

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

(See Chapter 7 of this Annex)

1. SPECIFICATIONS RELATED TO SIGMET INFORMATION

1.1 Format of SIGMET messages

...

1.1.6 **Recommendation.**— *Until 5 November 2020, Meteorological watch offices should issue SIGMET information should be disseminated in digital IWXXM GML form, in addition to the issuance dissemination of this SIGMET information in abbreviated plain language in accordance with 1.1.1.*

1.1.7 SIGMET if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML). From 5 November 2020, SIGMET information shall be disseminated in IWXXM GML form in addition to the dissemination of SIGMET information in accordance with 1.1.1.

1.1.8 SIGMET if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— *Guidance on the information exchange model IWXXM, XML/GML and the metadata profile is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) Digital Exchange of Aeronautical Meteorological Information (Doc 10003).*

...

2. SPECIFICATIONS RELATED TO AIRMET INFORMATION

2.1 Format of AIRMET messages

...

2.1.6 **Recommendation.**— *Until 5 November 2020, Meteorological offices should issue AIRMET information should be disseminated in digital IWXXM GML form, in addition to the issuance dissemination of this AIRMET information in abbreviated plain language in accordance with 2.1.1.*

2.1.7 AIRMET if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use XML/GML. From 5 November 2020, AIRMET information shall be disseminated in IWXXM GML form in addition to the dissemination of AIRMET information in accordance with 2.1.1.

2.1.8 AIRMET if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model IWXXM, XML/GML and the metadata profile is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) (Doc 10003).

...

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to support the exchange of aeronautical meteorological information using the ICAO Meteorological Information Exchange Model (IWXXM). This amendment supports the GANP and will encourage all ICAO States to ensure that they are ready to implement IWXXM for the international exchange of aeronautical meteorological information by November 2020.

INITIAL PROPOSAL 6

GREATER CLARITY IN THE PRESENTATION OF INFORMATION ABOUT TROPICAL CYCLONES (TC). (ANNEX 3)

PART II. APPENDICES AND ATTACHMENTS

...

APPENDIX 2. TECHNICAL SPECIFICATIONS RELATED TO WORLD AREA FORECAST SYSTEM, AND METEOROLOGICAL OFFICES AND OTHER CENTRES

(See Chapter 3 of this Annex)

Table A2-2. Template for advisory message for tropical cyclones

Key: = = a double line indicates that the text following it should be placed on the subsequent line.

Note 1.— The ranges and resolutions for the numerical elements included in advisory messages for tropical cyclones are shown in Appendix 6, Table A6-4.

Note 2.— The explanations for the abbreviations can be found in the PANS-ABC (Doc 8400).

Note 3.— All the elements are mandatory.

Note 43.— Inclusion of a “colon” after each element heading is mandatory.

Note 54.— The numbers 1 to 4921 are included only for clarity and they are not part of the advisory message, as shown in the example.

Element	Detailed content	Template(s)	Examples
1	Identification of the type of message	Type of message	TC ADVISORY
2	TEST or EXERCISE indicator (C) ¹	Indicator of TEST or EXERCISE TEST or EXERCISE	TEST or EXERCISE indicator (C) ¹ TEST or EXERCISE indicator (C) ¹
23	Time of origin	Year, month, day and time in UTC of issue	DTG: nnnnnnnn/nnnnZ DTG: 20040925/19600Z
34	Name of TCAC	Name of TCAC (location indicator or full name)	TCAC: nnnn or nnnnnnnnnn TCAC: YUFO ⁴² TCAC: MIAMI
45	Name of tropical cyclone	Name of tropical cyclone or “NN” for unnamed tropical cyclone	TC: nnnnnnnnnnnn or NN TC: GLORIA
56	Advisory number	Advisory number: Year in full and message number (separate sequence starting with “01” for each cyclone)	ADVISORY NR: nnnn/[n][n]nn ADVISORY NR: 2004/1304
67	Observed pPosition of the centre	Day and time (in UTC) and pPosition of the centre of the tropical cyclone (in degrees and minutes)	OBS PSN: nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] OBS PSN: 25/1800Z N2706 W07306
8	Observed CB cloud ³	Location of CB cloud (referring to latitude and longitude (in degrees and minutes)) and vertical extent (flight level)	CB: WI nnnKM (or nnnNM) OF TC CENTRE or WI ⁴ 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]] TOP [ABV or BLW] FLnnn CB: WI 250NM OF TC CENTRE TOP FL500
79	Direction and speed of movement	Direction and speed of movement given in sixteen compass points and km/h (or kt), respectively, or moving slowly (< 6 km/h (3 kt)) or stationary (< 2 km/h (1 kt))	MOV: N nnKMh (or KT) or NNE nnKMh (or KT) or NE nnKMh (or KT) or ENE nnKMh (or KT) or E nnKMh (or KT) or ESE nnKMh (or KT) or SE nnKMh (or KT) or SSE nnKMh (or KT) or S nnKMh (or KT) or SSW nnKMh (or KT) or SW nnKMh (or KT) or WSW nnKMh (or KT) or W nnKMh (or KT) or MOV: NW 20KMh

Element		Detailed content	Template(s)		Examples	
				WNW nnKMH (or KT) or NW nnKMH (or KT) or NNW nnKMH (or KT) or SLW or STNR		
810	Central pressure	Central pressure (in hPa)	C:	nnnHPA	C:	965HPA
911	Maximum surface wind	Maximum surface wind near the centre (mean over 10 minutes, in m/s (or kt))	MAX WIND:	nn[n]MPS (or nn[n]KT)	MAX WIND:	22MPS
4012	Forecast of centre position (+6 HR)	Day and time (in UTC) (6 hours from the "DTG" given in Item 6); Forecast position (in degrees and minutes) of the centre of the tropical cyclone	FCST PSN +6 HR:	nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	FCST PSN +6 HR:	26/0000Z N2748 W07350
4413	Forecast of maximum surface wind (+6 HR)	Forecast of maximum surface wind (6 hours after the "DTG" given in Item 6)	FCST MAX WIND +6 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +6 HR:	22MPS
4214	Forecast of centre position (+12 HR)	Day and time (in UTC) (12 hours from the "DTG" given in Item 6); Forecast position (in degrees and minutes) of the centre of the tropical cyclone	FCST PSN +12 HR:	nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	FCST PSN +12 HR:	26/0400Z N2830 W07430
4315	Forecast of maximum surface wind (+12 HR)	Forecast of maximum surface wind (12 hours after the "DTG" given in Item 6)	FCST MAX WIND +12 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +12 HR:	22MPS
4416	Forecast of centre position (+18 HR)	Day and time (in UTC) (18 hours from the "DTG" given in Item 6); Forecast position (in degrees and minutes) of the centre of the tropical cyclone	FCST PSN +18 HR:	nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	FCST PSN +18 HR:	26/1000Z N2852 W07500
4517	Forecast of maximum surface wind (+18 HR)	Forecast of maximum surface wind (18 hours after the "DTG" given in Item 6)	FCST MAX WIND +18 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +18 HR:	21MPS
4618	Forecast of centre position (+24 HR)	Day and time (in UTC) (24 hours from the "DTG" given in Item 6); Forecast position (in degrees and minutes) of the centre of the tropical cyclone	FCST PSN +24 HR:	nn/nnnnZ Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	FCST PSN +24 HR:	26/1600Z N2912 W07530
4719	Forecast of maximum surface wind (+24 HR)	Forecast of maximum surface wind (24 hours after the "DTG" given in Item 6)	FCST MAX WIND +24 HR:	nn[n]MPS (or nn[n]KT)	FCST MAX WIND +24 HR:	20MPS
4820	Remarks	Remarks, as necessary	RMK:	Free text up to 256 characters or NIL	RMK:	NIL

Element	Detailed content	Template(s)	Examples
4921 Expected time of issuance of next advisory	Expected year, month, day and time (in UTC) of issuance of next advisory	NXT MSG: [BFR] nnnnnnnn/nnnnZ or NO MSG EXP	NXT MSG: 20040925/2000Z

Notes.—

1. Use only when the message issued is a TEST or EXERCISE and is not to be used for operational decision-making. When TEST is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".
- 1.2. Fictitious location.
3. Optional field.
4. The number of coordinates should be kept to a minimum and should not normally exceed seven.

Example A2-2. Advisory message for tropical cyclones

TC ADVISORY	
DTG:	20040925/19600Z
TCAC:	YUFO
TC:	GLORIA
ADVISORY NR:	2004/1304
OBS PSN:	25/1800Z N2706 W07306
CB:	WI 250NM OF TC CENTRE
MOV:	NW 20KMH
C:	965HPA
MAX WIND:	22MPS
FCST PSN +6 HR:	25/2200Z N2748 W07350
FCST MAX WIND +6 HR:	22MPS
FCST PSN +12 HR:	26/0400Z N2830 W07430
FCST MAX WIND +12 HR:	22MPS
FCST PSN +18 HR:	26/1000Z N2852 W07500
FCST MAX WIND +18 HR:	21MPS
FCST PSN +24 HR:	26/1600Z N2912 W07530
FCST MAX WIND +24 HR:	20MPS
RMK:	NIL
NXT MSG:	20040926/0100Z

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

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

Note 2.— In accordance with 1.1.5 and 2.1.5, severe or moderate icing and severe or moderate turbulence (SEV ICE, MOD ICE, SEV TURB, MOD TURB) associated with thunderstorms, cumulonimbus clouds or tropical cyclones should not be included.

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
Location indicator of FIR/CTA (M) ¹	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET/AIRMET refers	nnnn		YUCC ² YUDD ²	
Identification (M)	Message identification and sequence number ³	SIGMET [n][n]n	AIRMET [n][n]n	SIGMET 1 SIGMET 01 SIGMET A01	AIRMET 9 AIRMET 19 AIRMET B19
Validity period (M)	Day-time groups indicating the period of validity in UTC	VALID nnnnnn/nnnnnn		VALID 010000/010400 VALID 221215/221600 VALID 101520/101800 VALID 251600/252200 VALID 152000/160000 VALID 192300/200300	
Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen	nnnn-		YUDO ⁻² YUSO ⁻²	
Name of the FIR/CTA (M)	Location indicator and name of the FIR/CTA ⁴ for which the SIGMET/AIRMET is issued	nnnn nnnnnnnnnn FIR/[UIR] or UIR or FIR/UIR or nnnn nnnnnnnnnn CTA	nnnn nnnnnnnnnn FIR/[n]	YUCC AMSWELL FIR ² YUDD SHANLON ² FIR/UIR ² UIR FIR/UIR YUDD SHANLON CTA ²	YUCC AMSWELL FIR/2 ² YUDD SHANLON FIR ²
IF THE SIGMET OR AIRMET MESSAGE IS TO BE CANCELLED, SEE DETAILS AT THE END OF THE TEMPLATE.					
TEST or EXERCISE indicator (C) ⁵	Indicator of TEST or EXERCISE	TEST or EXERCISE	TEST or EXERCISE	TEST EXERCISE	TEST EXERCISE
Phenomenon (M) ⁶	Description of phenomenon causing the issuance of SIGMET/AIRMET	OBSC ⁶⁷ TS[GR ⁷⁸] EMBD ⁶⁹ TS[GR ⁷⁸] FRQ ⁹¹⁰ TS[GR ⁷⁸] SQL ⁴⁶¹¹ TS[GR ⁷⁸] TC nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB or TC NN ⁴¹² PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB SEV TURB ⁴²¹³ SEV ICE ⁴³¹⁴ SEV ICE (FZRA) ⁴³¹⁴ SEV MTW ⁴⁴¹⁵ HVY DS HVY SS [VA ERUPTION] [MT nnnnnnnnnn] [PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn]]	SFC WIND nnn/nn[n]MPS (or SFC WIND nnn/nn[n]KT) SFC VIS nnnnM (nn) ⁴⁶¹⁶ ISOL ⁴⁶¹⁷ TS[GR ⁷⁸] OCNL ⁴⁷¹⁸ TS[GR ⁷⁸] MT OBSC BKN CLD nnn/[ABV] nnnnM (or BKN CLD [n]nnn/[ABV] [n]nnnnFT) or BKN CLD SFC/[ABV] nnnnM (or BKN CLD SFC/[ABV][n]nnnnFT) OVC CLD nnn/[ABV]nnnnM (or OVC CLD [n]nnn/[ABV] [n]nnnnFT)	OBSC TS OBSC TSGR EMBD TS EMBD TSGR FRQ TS FRQ TSGR SQL TS SQL TSGR TC GLORIA PSN N10 W060 CB TC NN PSN S2030 E06030 CB SEV TURB SEV ICE SEV ICE (FZRA) SEV MTW HVY DS HVY SS VA ERUPTION MT ASHVAL ² PSN S15 E073	SFC WIND 040/40MPS SFC WIND 310/20KT SFC VIS 1500M (BR) ISOL TS ISOL TSGR OCNL TS OCNL TSGR MT OBSC BKN CLD 120/900M BKN CLD 400/3000FT BKN CLD 1000/5000FT BKN CLD SFC/3000M BKN CLD SFC/ABV 10000FT OVC CLD 270/ABV3000M OVC CLD 900/ABV10000FT OVC CLD 1000/5000FT OVC CLD SFC/3000M

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		VA CLD RDOACT CLD	or OVC CLD SFC/[ABV]nnnnM (or OVC CLD SFC/[ABV][n]nnnnFT) ISOL ⁴⁶¹⁷ CB ⁴⁸¹⁹ OCNL ⁴⁷¹⁸ CB ⁴⁸¹⁹ FRQ ⁴⁹¹⁰ CB ⁴⁸¹⁹ ISOL ⁴⁶¹⁷ TCU ⁴⁸¹⁹ OCNL ⁴⁷¹⁸ TCU ⁴⁸¹⁹ FRQ ⁴⁹¹⁰ TCU ⁴⁸¹⁹ MOD TURB ⁴²¹³ MOD ICE ⁴³¹⁴ MOD MTW ⁴⁴¹⁵	VA CLD RDOACT CLD	OVC CLD SFC/ABV 10000FT ISOL CB OCNL CB FRQ CB ISOL TCU OCNL TCU FRQ TCU MOD TURB MOD ICE MOD MTW
Observed or forecast phenomenon (M)	Indication whether the information is observed and expected to continue, or forecast	OBS [AT nnnnZ] or FCST [AT nnnnZ]		OBS OBS AT 1210Z FCST FCST AT 1815Z	
Location (C) ⁴⁹²⁰	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 ²⁹²¹ or NE OF LINE ²⁹²¹ or E OF LINE ²⁹²¹ or SE OF LINE ²⁹²¹ or S OF LINE ²⁹²¹ or SW OF LINE ²⁹²¹ or W OF LINE ²⁹²¹ or NW OF LINE ²⁹²¹ 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 ²⁹²¹ or NE OF LINE ²⁹²¹ or E OF LINE ²⁹²¹ or SE OF LINE ²⁹²¹ or S OF LINE ²⁹²¹ or SW OF LINE ²⁹²¹ or W OF LINE ²⁹²¹ or NW OF LINE ²⁹²¹ 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 W ^{2921, 2422} 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] –		ENTIRE FIR ENTIRE UIR ENTIRE FIR/UIR ENTIRE CTA	

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]]</p> <p>or</p> <p>APRX nnKM WID LINE²⁰²¹ BTN (or nnNM WID LINE²⁰²¹ 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]]</p> <p>or</p> <p>ENTIRE FIR{UIR}</p> <p>or</p> <p>ENTIRE FIR</p> <p>or</p> <p>ENTIRE FIR/UIR</p> <p>or</p> <p>ENTIRE CTA</p> <p>or²²²³</p> <p>WI nnnKM (or nnnNM) OF TC CENTRE</p> <p>or²⁹</p> <p>WI nnnNM or nnnKM OF Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]</p>		<p>WI 400KM OF TC CENTRE</p> <p>WI 250NM OF TC CENTRE</p> <p>WI 30KM OF N6030 E02550</p>	
Level (C) ¹⁹²⁰	Flight level or altitude ²³	<p>[SFC/]FLnnn or [SFC/]nnnnM (or [SFC/][n]nnnnFT) or FLnnn/nnn or TOP FLnnn or [TOP] ABV FLnnn or (or [TOP] ABV [n]nnnnFT) [nnnn/nnnnM (or [[n]nnnn/][n]nnnnFT) or [nnnnM/]FLnnn (or [[n]nnnnFT/]FLnnn)</p> <p>or²²²³</p> <p>TOP [ABV or BLW] FLnnn</p>		<p>FL180</p> <p>SFC/FL070</p> <p>SFC/3000M</p> <p>SFC/10000FT</p> <p>FL050/080</p> <p>TOP FL390</p> <p>ABV FL250</p> <p>TOP ABV FL100</p> <p>ABV 7000FT</p> <p>TOP ABV 9000FT</p> <p>TOP ABV 10000FT</p> <p>3000M</p> <p>2000/3000M</p> <p>8000FT</p> <p>6000/12000FT</p> <p>2000M/FL150</p> <p>10000FT/FL250</p> <p>TOP FL500</p> <p>TOP ABV FL500</p> <p>TOP BLW FL450</p>	
Movement or expected movement (C) ^{1920, 24}	Movement or expected movement (direction and speed) with reference to one of the sixteen points of compass, or stationary	<p>MOV N [nnKMH] or MOV NNE [nnKMH] or MOV NE [nnKMH] or MOV ENE [nnKMH] or MOV E [nnKMH] or MOV ESE [nnKMH] or MOV SE [nnKMH] or MOV SSE [nnKMH] or MOV S [nnKMH] or MOV SSW [nnKMH] or MOV SW [nnKMH] or MOV WSW [nnKMH] or MOV W [nnKMH] or MOV WNW [nnKMH] or MOV NW [nnKMH] or MOV NNW [nnKMH] (or MOV N [nnKT] or MOV NNE [nnKT] or MOV NE [nnKT] or MOV ENE [nnKT] or MOV E [nnKT] or MOV ESE [nnKT] or MOV SE [nnKT] or MOV SSE [nnKT] or MOV S [nnKT] or MOV SSW [nnKT] or</p>		<p>MOV SE</p> <p>MOV NNW</p> <p>MOV E 40KMH</p> <p>MOV E 20KT</p> <p>MOV WSW 20KT</p> <p>STNR</p>	

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		MOV SW [nnKT] or MOV WSW [nnKT] or MOV W [nnKT] or MOV WNW [nnKT] or MOV NW [nnKT] or MOV NNW [nnKT]) or STNR			
Changes in intensity (C) ¹⁹²⁰	Expected changes in intensity	INTSF or WKN or NC		INTSF WKN NC	
Forecast time (C) ²⁴	Indication of the forecast time of phenomenon	FCST AT nnnnZ	—	FCST AT 2200Z	—
TC forecast position (C) ²²	Forecast position of TC centre at the end of the validity period of the SIGMET message	TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]	—	TC CENTRE PSN N1030 or E1600015	TC forecast position (C) ²²
Forecast position (C) ^{1920, 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 ²⁰²¹ or NE OF LINE ²⁰²¹ or E OF LINE ²⁰²¹ or SE OF LINE ²⁰²¹ or S OF LINE ²⁰²¹ or SW OF LINE ²⁰²¹ or W OF LINE ²⁰²¹ or NW OF LINE ²⁰²¹ 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]]	—	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 UIR ENTIRE FIR/UIR ENTIRE CTA TC CENTRE PSN N2740 W07345 NO VA LONGER EXP	—

Element	Detailed content	SIGMET template	AIRMET template	SIGMET message examples	AIRMET message examples
		<p>[AND N OF LINE²⁰²¹ or NE OF LINE²⁰²¹ or E OF LINE²⁰²¹ or SE OF LINE²⁰²¹ or S OF LINE²⁰²¹ or SW OF LINE²⁰²¹ or W OF LINE²⁰²¹ or NW OF LINE²⁰²¹ 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 W^{2021, 2422} 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]</p> <p>or</p> <p>APRX nnKM WID LINE²⁰²¹ BTN (nnNM WID LINE²⁰²¹ 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]]</p> <p>or</p> <p>ENTIRE FIR{UIR}</p> <p>or</p> <p>ENTIRE UIR</p> <p>or</p> <p>ENTIRE FIR/UIR</p> <p>or</p> <p>ENTIRE CTA</p> <p>or²² TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]</p> <p>or²⁶ NO VA LONGER EXP</p>			

<i>Element</i>	<i>Detailed content</i>	<i>SIGMET template</i>	<i>AIRMET template</i>	<i>SIGMET message examples</i>	<i>AIRMET message examples</i>
Repetition of elements (C) ²⁷	Repetition of elements included in a SIGMET message for volcanic ash cloud or tropical cyclone	[AND] ²⁷	—	AND	—
OR					
Cancellation of SIGMET/AIRMET (C) ²⁸	Cancellation of SIGMET/AIRMET referring to its identification	CNL SIGMET [n][n]n nnnnnn/nnnnnn or ²⁶ CNL SIGMET [n][n]n nnnnnn/nnnnnn VA MOV TO nnnn FIR	CNL AIRMET [n][n]n nnnnnn/nnnnnn	CNL SIGMET 2 101200/101600 CNL SIGMET A13 251030/251430 VA MOV TO YUDO FIR ²	CNL AIRMET 05 151520/151800

Notes.—

1. See 4.1.
2. Fictitious location.
3. In accordance with 1.1.3 and 2.1.2.
4. See 2.1.3.
5. Used only when the message is issued as a TEST or EXERCISE. Under such circumstances the information contained within the message is not to be used for operational decision-making. When this field is omitted, information contained within the message is intended to be used operationally. When TEST is indicated, the message may contain information (not to be used operationally) or will otherwise end immediately after the word "TEST".
56. In accordance with 1.1.4 and 2.1.4.
67. In accordance with 4.2.1 a).
78. In accordance with 4.2.4.
89. In accordance with 4.2.1 b).
910. In accordance with 4.2.2.
1011. In accordance with 4.2.3.
1112. Used for unnamed tropical cyclones.
1213. In accordance with 4.2.5 and 4.2.6.
1314. In accordance with 4.2.7.
1415. In accordance with 4.2.8.
1516. In accordance with 2.1.4.
1617. In accordance with 4.2.1 c).
1718. In accordance with 4.2.1 d).
1819. The use of cumulonimbus (CB) and towering cumulus (TCU) is restricted to AIRMETs in accordance with 2.1.4.
1920. In the case of volcanic ash cloud or cumulonimbus clouds associated with a tropical cyclone covering more than one area within the FIR, these elements can be repeated, as necessary.
2021. A straight line is to be used between two points drawn on a map in the Mercator projection or between two points which crosses lines of longitude at a constant angle.
2122. The number of coordinates should be kept to a minimum and should not normally exceed seven.
2223. Only for SIGMET messages for tropical cyclones.
23. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
24. The elements "forecast time" and "forecast position" are not to be used in conjunction with the element "movement or expected movement".
25. The levels of the phenomena remain fixed throughout the forecast period.
26. Only for SIGMET messages for volcanic ash.
27. To be used for two volcanic ash clouds or two centres of tropical cyclones simultaneously affecting the FIR concerned..
28. End of the message (as the SIGMET/AIRMET message is being cancelled).
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.

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to improve the clarity of the information on tropical cyclones (TC) provided by Annex 3, Table A2-2 Template for advisory message for tropical cyclones, with respect to the advisory number, observation time, centre position, and observed CB cloud. These proposed provisions are reflected in proposals for related changes to SIGMET and AIRMET message.

INITIAL PROPOSAL 7

**QUALIFICATION AND COMPETENCY, EDUCATION AND TRAINING OF PERSONNEL
ENGAGED IN THE PROVISION OF METEOROLOGICAL SERVICE FOR INTERNATIONAL
AIR NAVIGATION (ANNEX 3)**

CHAPTER 2. GENERAL PROVISIONS

2.1 Objective, determination and provision of meteorological service

2.1.5 Each Contracting State shall ensure that the designated meteorological authority complies with the requirements of the World Meteorological Organization (WMO) in respect of qualifications, ~~and~~ competencies, education and training of meteorological personnel providing service for international air navigation.

Note.— Requirements concerning the qualifications, ~~and~~ competencies, education and training of meteorological personnel in aeronautical meteorology are given in the Technical Regulations (WMO-No. 49), Volume I — General Meteorological Standards and Recommended Practices, Part V — Qualifications and Competencies of Personnel Involved in the Provision of Meteorological (Weather and Climate) and Hydrological Services, Part VI — Education and Training of Meteorological Personnel, and Appendix A — Basic Instruction Packages.

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to update Annex 3 with regard to the qualifications, competency, education and training of meteorological personnel to be consistent with the relevant World Meteorological Organization Technical Regulations. This amendment is similar to the provisions already provided in Annex 15, 3.7.4.

— — — — —

APPENDIX B

PROPOSED AMENDMENT TO ANNEX 15

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

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New text to be inserted is highlighted with grey shading.

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the replacement text which is highlighted with grey shading.

new text to replace existing text

PROPOSED AMENDMENT TO
ANNEX 15 — AERONAUTICAL INFORMATION SERVICES

INITIAL PROPOSAL 1
INTRODUCTION OF A SPACE WEATHER INFORMATION SERVICE SUPPORTING
INTERNATIONAL AIR NAVIGATION (ANNEX 15)

CHAPTER 5. NOTAM

5.1 Origination

...

5.1.1.1 A NOTAM shall be originated and issued concerning the following information:

...

- t) forecasts of solar cosmic radiation, where provided space weather events (that have an impact on high frequency radio communications, GNSS-based navigation and surveillance, and radiation exposure at flight levels), the date and time of the event, the flight levels where provided, and portions of airspace which could be affected;

...

<i>Origin</i>	Rationale
METP/2	This amendment has been introduced to support the initial implementation of the provision of space weather information to enhance the safety and efficiency of international air navigation consistent with the Global Air Navigation Plan.

— — — — —

APPENDIX C

PROPOSED AMENDMENT TO PANS-ABC (DOC 8400)

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

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the replacement text which is highlighted with grey shading.

new text to replace existing text

PROPOSED AMENDMENT TO
PROCEDURES FOR AIR NAVIGATION SERVICES — ICAO ABBREVIATIONS AND CODES
(PANS-ABC, Doc 8400)

INITIAL PROPOSAL 1
INTRODUCTION OF A SPACE WEATHER INFORMATION SERVICE SUPPORTING
INTERNATIONAL AIR NAVIGATION (PANS-ABC)

ABBREVIATIONS

DECODE

...			
E		M	
...		...	
EOBT	Estimated off-block time	MM	Middle marker
EQN	Equatorial latitudes northern hemisphere	MNH	Middle latitudes northern hemisphere
EQPT	Equipment	MNM	Minimum
EQS	Equatorial latitudes southern hemisphere	...	
...		MSG	Message
H		MSH	Middle latitudes southern hemisphere
...		MSL	Mean sea level
HN	Sunset to sunrise	...	
HNH	High latitudes northern hemisphere	S	
HO	Service available to meet operational requirements	...	
...		SWB	South-westbound
HS	Service available during hours of scheduled operations	SWX	Space weather
HSN	High latitudes southern hemisphere	SWXC	Space weather centre
HUD	Head-up display	...	
...			

<i>Origin</i>	Rationale
METP/2	This proposed amendment has been introduced to support the initial implementation of the provision of space weather information to enhance the safety and efficiency of international air navigation consistent with the Global Air Navigation Plan.

— — — — —

APPENDIX D

PROPOSED AMENDMENT TO PANS-ATM (DOC 4444)

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

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New text to be inserted is highlighted with grey shading.

new text to be inserted

~~Text to be deleted is shown with a line through it~~ followed by
the replacement text which is highlighted with grey shading.

new text to replace existing text

PROPOSED AMENDMENT TO
PROCEDURES FOR AIR NAVIGATION SERVICES — AIR TRAFFIC MANAGEMENT
(PANS-ATM, DOC 4444)

<p>INITIAL PROPOSAL 1</p> <p>INTRODUCTION OF A SPACE WEATHER INFORMATION SERVICE SUPPORTING INTERNATIONAL AIR NAVIGATION (PANS-ATM)</p>

CHAPTER 9
FLIGHT INFORMATION SERVICE AND ALERTING SERVICE

9.1 FLIGHT INFORMATION SERVICE

...

9.1.3 Transmission of information

...

9.1.3.8 TRANSMISSION OF INFORMATION CONCERNING SPACE WEATHER ACTIVITY

Information on space weather events that have an impact on high frequency radio communications, GNSS-based navigation and surveillance, and radiation exposure at flight levels, within the area of responsibility of the ATS unit shall be transmitted to aircraft by one or more of the means specified in 9.1.3.1.1.

...

CHAPTER 15
**PROCEDURES RELATED TO EMERGENCIES,
COMMUNICATION FAILURE AND CONTINGENCIES**

...

15.5 OTHER IN-FLIGHT CONTINGENCIES

...

15.5.5 Descents by ~~supersonic~~ aircraft due to solar ~~cosmic~~ radiation from space weather events

Air traffic control units should be prepared for the possibility that ~~supersonic~~ aircraft ~~operating at levels above 15 000 m (49 000 ft)~~ may, on rare occasions, experience a rise in solar ~~cosmic~~ radiation which requires them to descend to lower levels, ~~possibly down to or below the levels being used by subsonic aircraft~~. When such a situation is known or suspected, air traffic control units should take all possible action to safeguard all aircraft concerned, including any ~~subsonic~~ aircraft affected by the descent.

Note.— All ~~supersonic~~ aircraft in a particular portion of airspace and above a certain altitude may ~~will~~ be affected at the same time, and the event may be accompanied by a deterioration or loss of air-ground communications. It is expected that the aircraft will alert air traffic control units before the radiation reaches a critical level and will request a descent clearance when the critical level is reached. However, situations may occur in which the aircraft will need to descend without waiting for a clearance. In such cases, the aircraft are expected to advise air traffic control units, as soon as possible, of the emergency action taken.

...

Origin	Rationale
METP/2	This proposed amendment has been introduced to support the initial implementation of the provision of space weather information to enhance the safety and efficiency of international air navigation consistent with the Global Air Navigation Plan.



APPENDIX E

New SARP / PANS Proposal

IMPACT ASSESSMENT AND IMPLEMENTATION PLAN

PART 1: IMPACT ASSESSMENT

1.1 What is the problem/opportunity that this proposal is designed to address?

Please include reference to Jobcard / ASBU / work programme item, as applicable

1. METP.006.01 - The release of radioactive materials into the atmosphere could pose a risk to aircraft operations and the health of its occupants, air traffic and aerodromes. There is a need to continue and enhance existing international arrangements and procedures to keep aircraft operations out of areas affected by the release of radioactive material into the atmosphere.
2. METP.009.01 - Space weather events such as solar radiation storms, solar flares, geomagnetic storms and ionospheric disturbances that impact Earth pose a risk to flight safety, impacting communication, navigation systems, on board avionics and also pose a risk to the health of aircraft occupants.
3. METP.004.01 - Aeronautical meteorological information needs to be integrated into the SWIM-enabled environment (through use of XML/GML approach – hence IWXXM) which introduces unique issues relating to governance and data management.
4. METP.003.01 - The international airways volcano watch (IAVW) was established to provide notification (via advisory messages, SIGMETs and other notices) to international air navigation regarding the existence of volcanic ash in the atmosphere. The IAVW needs to be maintained and further developed including the integration of the information provided into the future system wide information management (SWIM) in support of the ASBU methodology.
5. METP.007.01 - To address user needs for better harmonization of en-route hazardous weather information by including the note referring meteorological watch offices to the guidance on bilateral and multilateral cooperation and coordination for the issuance of SIGMET information messages.
6. Annex 3 needs to be updated with regard to the clear testing and exercising of SIGMET, AIRMET, VAA and TCA, better enabling MWOs and Centres to test and improve the provision and content without confusing end users.
7. Annex 3 needs to be updated with regard to the qualifications, competency, education and training of meteorological personnel with respect to the primary World Meteorological Organization (WMO) frameworks. The proposed amendment is similar to that already provided in Annex 15 (para 3.7.4).

1.2 What is the overall impact of this proposal on the strategic objectives of ICAO, namely:

	Positive / Negative / Negligible/None	Rationale: <i>Please provide an explanation for your choice and highlight any caveats or limitations in the selection</i>
Safety	Positive	The safety of aircraft operations is enhanced with access to improved information on current and expected atmospheric conditions. Improved information about space weather events that may affect communications, navigation and surveillance systems utilized by the aviation industry will lead to improved decision-making, particularly in the planning phase, to mitigate the potential impacts of space weather events on aircraft operations.
Security	Negligible/None	Data security and governance may be enhanced with the implementation of IWXXM in a SWIM environment.
Environment	Negligible/None	None identified.
Efficiency	Positive	The efficiency of aircraft operations is enhanced with more timely access to and

		incorporation of digital meteorological information in flight planning, flow management and aircraft management. Improved information about space weather events will improve route selection and fuel-loading decisions and minimize the need for rerouting flights due to the potential impacts of space weather events.
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Note: In the following questions 'States' applies to the adoption and oversight of new SARPs. 'Industry' applies to the service provision and use, whether State owned or not (e.g. ANSPs, airlines aerodromes, meteorology, general aviation, etc). With respect to financial costs for States, it refers to the cost to develop, implement, maintain, and consider oversight issues associated with the proposed change. For Industry, it refers to the cost of implementing the change, where compliance is required by the State, which may translate in costs for equipage, human resources, training, documentation, aircraft modifications or upgrades, operations and airworthiness for example.

1.3 What is the overall impact on resources (financial, personnel, etc.) of this proposal for:

	Increase/decrease/negligible/unknown	Rationale: <i>Please provide an explanation for your choice and highlight any caveats or limitations in the selection</i>
States	Increase in overall cost	The Provider States will have increased costs in the provision of space weather services, at least over the initial three years where there may not be a regional cost recovery mechanism. The cost to States to implement IWXXM will increase to various extents, depending on prevailing State capabilities.
Industry	Decrease in overall cost	Efficiency enhancements will reduce industry costs.

1.4 In your opinion, do the benefits of this proposal justify the cost of implementing the proposal from the perspective of:

	Answer	Rationale: <i>Please provide an explanation for your choice and highlight any caveats or limitations in the selection</i>
States	Yes	These proposals are integral to the global effort in civil aviation safety and efficiency. They lay the foundation for more effective provision and use of more extensive meteorological information.
Industry	Yes	

PART 2: IMPLEMENTATION PLAN

To assist ICAO and States ensure this proposal will be effectively implemented please answer the following questions.

Note: The ANC recognizes that panel experts may feel limited in their ability to answer some or all of these questions, however, encourages the panels to provide their views. If still unsure, it is acceptable to leave one or more blank. The answers presented to the ICAO Council with the proposed amendment will be further developed by ICAO.

2.1 What supporting documentation is required for this proposed amendment?

<p><i>Please include reference to any documents that require initial release/amendment e.g. ICAO Document or Circular name and number, industry specification, etc</i></p> <ul style="list-style-type: none"> • <i>Manual on Aeronautical Meteorological Practices (Doc 8896);</i> • <i>Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691);</i> • <i>Handbook on International Airways Volcano Watch (IAVW) – Operational Procedures and Contact List (Doc 9766)</i> • <i>Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377)</i> • <i>Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003)</i> • <i>Manual on Space Weather Information (Doc #####) (to be developed to support implementation by November 2018).</i> • <i>Quality Management System for the Provision of Aeronautical Meteorological Service for International Air Navigation (Doc 9873)</i>
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2.2 What other guidance, training and support activities do you recommend ICAO undertake to ensure the effective implementation of this proposed amendment?

Please include reference to any existing support/promotional programmes and whether it is required globally or regionally e.g. regional seminars, iKits, etc.

- Regional SIGMET guides to be amended for:
 - the use of TEST and EXERCISE;
 - the initial and subsequent issuance of SIGMETs for radioactive clouds when information on the amount released as well as type of radioactive material is not available to the meteorological watch office;
 - the minor changes to the SIGMET and AIRMET template.
- The coordination and cooperation between meteorological watch offices for the provision of SIGMET messages

And generally:

- Coordination with PIRGs and WMO.
- Ongoing consultation with users: IATA and IFALPA.
- Completing the new arrangements between ICAO / WMO (Doc 7475).

2.3 What are the essential steps to be followed by a State in order to implement this proposed amendment?

Please include the major steps e.g. amendment of national legislation, change of oversight procedures, training of oversight personnel, required competencies, etc.

- The only major step for the minor changes to the existing products in Annex 3 is training. This training would be minimal and directed at the meteorologists who provide the AIRMET, SIGMET, and volcanic ash and tropical cyclone advisories, as well as the users of these products (e.g., pilots, air traffic controllers). It is expected that on-station or available personnel already responsible for training would conduct the training.
- For the provision of space weather information:
 - Update eANP Aeronautical Information Publication to identify the Provider State(s) for space weather information for the State and/or geographic region.
 - Update national policies and procedures for impacts of space weather events on the State air traffic management system.
- Update oversight procedures and training of oversight personnel to include the space weather information service.
- For IWXXM, the transition is staged and makes allowance for some States to defer full implementation. An extended period of time that will accommodate these States will be enabled as necessary. It is anticipated that most States will implement, within reasonable timeframes, as the advantages of doing so become clear.

2.4 What is the timeframe needed to implement this proposal by:

	Answer	Rationale: <i>For the State, the timeframe is the length of time needed to implement in the national regulatory framework For industry, the timeframe is the length of time needed for industry to start implementing in their operations</i>
States	0 - 2 Years	<ul style="list-style-type: none"> • 0 - 1 years with regards to training and implementation for SIGMET, AIRMET, TCA, VAA proposals as there is minimal training required; • Implementation of IWXXM is ongoing (GANP) hence no definable expectation at this stage; • 1 - 2 years with regards to space weather information system operations under regulatory and co-operative frameworks. Training will only need to cover the representation of existing expertise in new templates and communications protocols.

Industry	0 - 2 Years	<ul style="list-style-type: none">• 0 - 1 years with regards to training and implementation for SIGMET, AIRMET, TCA, VAA proposals as there is minimal training in system integration and interpretation required;• Implementation of IWXXM is ongoing (GANP);• 0 - 2 years with regards to space weather information system operations integration into industry/user systems. Training will only need to cover the representation of information currently used in the form of the new templates.
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PART 3: AUDIT PLAN

Note: This section will be completed by ICAO prior to the presentation of any proposed changes to SARPs or PANS. The Panel Secretary will coordinate with the relevant experts in ICAO.

3.1 Does this proposal require an amendment of the USOAP CMA protocol questions to assess effective implementation by States?

Please include reference to existing PQs that may need amendment or description of any new PQs that may be required. State 'Not applicable' if no impact.

- No amendment of the USOAP CMA protocol questions is required.

— END —