



International Civil Aviation Organization

**SEVENTEENTH MEETING OF THE METEOROLOGY
SUB-GROUP (MET SG/17) OF APANPIRG**

Bangkok, Thailand, 13 – 16 May 2013

Agenda Item 7: Meteorological advisories, warnings and hazards

- 7.2) implementations of advisories and warnings
- space weather

SPACE WEATHER

(Presented by the Secretariat)

SUMMARY

This paper presents an overview of activities concerning the development of guidance for aspects of space weather that are relevant to the Meteorology Sub-group (MET SG) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG).

1. Introduction

1.1 Stemming from discussions on the topic of space weather at the Sixteenth Meeting of the Communications, Navigation, Surveillance and Meteorology Sub-group (CNS/MET SG/16), held in Bangkok, Thailand, from 23 to 27 July 2012, the Twenty-third Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/23) adopted Decision 23/48 – *Aspect of space weather*, that called for the CNS and MET Sub-groups to review the impact of space weather in the CNS and MET areas and report to APANPIRG.

2. Discussion

2.1 The meeting may recall that, in addition to its principle function for overseeing the operation and the development of the international airways volcano watch (IAVW), the IAVW Operations Group (IAVWOPSG) is also overseeing the development of operational requirements for space weather products intended for international air navigation flight planning purposes and proposed for inclusion in Amendment 77 of Annex 3 (applicability November 2016). Guidelines/guidance to support potential future provisions on space weather is also under development.

2.2 Furthermore, a draft concept of operations for the provision of space weather information in support of international air navigation is intended to be finalized by the IAVWOPSG in time for the proposed MET Divisional Meeting (July 2014).

2.3 The activities noted in 2.1 and 2.2, above, were most recently reviewed by the Seventh Meeting of the IAVWOPSG (IAVWOPSG/7), which adopted the following (3) relevant conclusions:

IAVWOPSG/7 Conclusion 7/38 – Amendment to Annex 3 related to space weather (Target date: November 2014)

That the proposal to amend Annex 3 — *Meteorological Service for International Air Navigation* be consolidated with other elements of Amendment 77.

IAVWOPSG/7 Conclusion 7/39 – Space weather impacts on international air navigation (Target date: November 2013)

That an ad-hoc working group consisting of Australia, Chile, France, Japan, the United Kingdom (Rapporteur), the United States, IATA, ICCAIA and WMO be tasked to:

- a) review the “Space Weather Effects in regard to International Air Navigation” document (available on the IAVWOPSG website) including a retitling to “Space Weather Impacts on International Air Navigation” to ensure that its content supports the proposed amendment to Annex 3 — *Meteorological Service for International Air Navigation* under Conclusion 7/38;
- b) study the addition of space weather aviation colour codes to the “Space Weather Impacts on International Air Navigation” document referred to in a) above;
- c) provide a final draft of the “Space Weather Impacts on International Air Navigation” document to the Secretary no later than 30 November 2013 with a view to it forming the basis of an ICAO manual supporting potential future provisions on space weather; and
- d) prepare a progress report in time for the IAVWOPSG/8 meeting.

IAVWOPSG/7 Conclusion 7/40 – Draft concept of operations for the provision of space weather information in support of international air navigation (Target date for part b: November 2013)

That:

- a) the draft concept of operations for the provision of space weather information in support of international air navigation, version 2.2 of December 2012, as supported in principle by the group, be made available by the Secretary on the IAVWOPSG website by May 2013; and
- b) an ad-hoc group consisting of Australia, China, France, Japan, the United Kingdom (Rapporteur), the United States, IATA, ICCAIA and WMO, assisted by the Secretary, be tasked to review the concept of operations referred to in a) above and propose further changes, as necessary, in time for IAVWOPSG/8 in view of the provision of a final version to the proposed ICAO Meteorology Divisional Meeting (July 2014).

2.4 A copy of the draft proposal to amend Annex 3 — *Meteorological Service for International Air Navigation*, developed by the IAVWOPSG, is provided in the **Appendix** to this paper. The “Space Weather Effects in regard to International Air Navigation” document and the draft concept of operations for the provision of space weather information in support of international air navigation, version 2.2 of December 2012, will be available on the IAVWOPSG website (<http://www.icao.int/safety/meteorology/iavwopsg/Pages/default.aspx>), along with other relevant material including the report from IAVWOPSG/7.

3. Action by the Meeting

3.1 The meeting is invited to:

- a) review the information contained in this paper in view that the information is intended for presentation to APANPIRG/24 ; and
- b) discuss any relevant matters as appropriate.

Appendix

(Reproduced from APPENDIX N to the Report on IAVWOPSG/7)

DRAFT AMENDMENT TO ANNEX 3 — METEOROLOGICAL SERVICE FOR INTERNATIONAL AIR NAVIGATION (EIGHTEENTH EDITION — JULY 2013)

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PART I. CORE SARPs CHAPTER 1. DEFINITIONS

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1.1 Definitions

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Space weather centre (SWXC). A centre designated by regional air navigation agreement to provide information on space weather affecting the earth's surface or atmosphere that is expected to affect communications and navigation systems and may pose a radiation risk to flight crew members and passengers.

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CHAPTER 3. WORLD AREA FORECAST SYSTEM AND METEOROLOGICAL OFFICES

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Editorial Note.— Insert the following new text.

3.8 Space weather centres

3.8.1 A Contracting State, having accepted, by regional air navigation agreement, the responsibility for providing a space weather centre (SWXC), shall arrange for that centre to provide information on space weather affecting the earth's surface or atmosphere expected to affect communications and navigation systems and which may pose a radiation risk to flight crew members and passengers by arranging for that centre to:

- a) monitor relevant ground-based, airborne, and space-based observations to detect the existence and extent of the following in the area concerned:
 - 1) geomagnetic storms;
 - 2) solar radiation storms;
 - 3) solar flares that result in radio blackout; and
 - 4) ionosphere activity.
- b) provide space weather information regarding the type, intensity and extent of the space weather referred to in a);
- c) supply space weather information referred to in b) to:
 - 1) area control centres and flight information centres 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 centres designated by regional air navigation agreement for the operation of aeronautical fixed service satellite distribution system and internet-based services

3.8.2 SWXCs 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 meteorological centre, as designated by the SWXC Provider State concerned.

Note.— Guidance on the provision of space weather information is provided in the Manual on the Effects of Space Weather on International Air Navigation (Doc #####).

END OF NEW TEXT

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