

OUTCOME OF RELEVANT WMO, ITU, AND RELATED MEETINGS

Outcome of WMO meetings with relevance to space weather

(Submitted by the Secretariat)

Summary and Purpose of Document

This document highlights some outcomes of WMO meetings with direct relevance to ICTSW activities:

- The WMO Executive Council (EC),
- The Commission for Aeronautical Meteorology (CAeM) with ICAO
- The Commission for Instruments and Methods of Observation (CIMO)
- The Commission for Basic Systems (CBS).

ACTION PROPOSED

The Inter-Programme Coordination Team is invited to take note.

DISCUSSION

1. 66th Session of the WMO Executive Council (EC-66)

The EC-66 was held from 12 to 27 June 2014. Among the decisions taken, the Council has requested the Secretary-General to prepare a four-year plan to frame the activities of Members in Space Weather service delivery and to establish a Trust Fund.

The purpose of a Trust Fund is to collect voluntary contributions from Members in addition to the regular budget in order to promote specifically identified activities.

2. Joint meeting of the Commission for Aeronautical Meteorology (CAeM) and ICAO

The sixteenth session of CAeM was held in Montreal, Canada, from 8 to 15 July 2014 and included a Joint WMO-ICAO Meteorological Divisional Meeting with the International Civil Aviation Organization (ICAO). (See: <http://caem-15.wmo.int/>).

This joint meeting discussed the possible definition and organisation of future space weather information services to be delivered in support of international air traffic navigation. Once approved by the parties, such services will be listed in an amendment to Annex 3 of the ICAO Convention and will become mandatory. A contribution was submitted by WMO on the basis of the guidance provided by the ICTSW. The relevant extract of the ICAO meeting report is provided in Appendix.

On this occasion, XiaoXin Zhang, ICTSW Co-chair, gave a [presentation](#) on space weather and ICTSW activities.

3. Commission for Instruments and Methods of Observation (CIMO)

The sixteenth session of the Commission for Instruments and Methods of Observation was held in St Petersburg, Russian Federation, from 10 to 16 July 2014.

SI traceability: In view of the key role played by traceability of observations in many application areas, especially in climate for the assessment of climate variability and changes, the Commission was pleased to note the progress in developing a CIMO strategy to improve the traceability of instrument calibrations. The Commission recalled that the ultimate goal was to ensure proper traceability of observations to the International System of Units (SI) through an uninterrupted calibration chain of the instruments.

CIMO Guide: The Commission appreciated the substantial contributions made to update the CIMO Guide, which had been posted on the WMO/IMOP website for Members to review. It noted that the Chapter on satellite observation had been replaced by seven totally new chapters comprising the new Part III of the CIMO Guide. Space weather missions and observations are addressed in sections 4.6 and 5.9 of this new Part III.

(See: <http://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/Provisional2014Edition.html>)

Taking into account the result of the review, the Commission approved the Provisional 2014 Edition of the CIMO Guide and recommended its publication. The Commission encouraged Members to provide in-kind support and/or contribute to the CIMO Trust Fund to support further translation of the CIMO Guide.

4. Commission for Basic Systems (CBS)

The Extraordinary session 2014 of the Commission for Basic Systems (CBS-Ext(2014)) was held in Asunción, Paraguay, from 8 to 12 September 2014. Among its main decisions related to satellite matters, the session:

- Welcomed the initiative to develop a new Vision of WIGOS component observing systems in 2040. It encouraged IPET-OSDE, in consultation with ET-SAT, ET-SUP and other groups, to update the space-based component of the current Vision taking into account the advances in remote-sensing and satellite technology, the increasing maturity of space applications, the diversity of orbits and mission concepts required for a balanced and robust space-based observing system.
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Appendix: Extract from the report of the joint WMO/CAeM- ICAO/MET divisional meeting

Space weather

2.2.7 The meeting noted the recent work carried out by the International Airways Volcano Watch Operations Group (IAVWOPSG) to develop draft initial provisions for inclusion in Annex 3/Technical Regulations [C3.1] to meet the requirements for information concerning space weather, involving the establishment of space weather centres. Additionally, the meeting noted the complementary development of a concept of operations for space weather information services which, as a living document, would be expected to evolve in line with the GANP, which explicitly included space weather as agreed by ICAO's Twelfth Air Navigation Conference in 2012 (AN-Conf/12), and that space weather information should be integrated into the future SWIM environment.

2.2.8 Taking into account the advice of WMO, including the WMO Inter-Programme Coordination Team on Space Weather (ICTSW) and others concerned, the meeting was of the view that space weather information services which serve international air navigation should be organized through the establishment of an optimal number of global centres (for solar radiation storms and solar flares, as well as for geomagnetic storms and ionospheric disturbances at the predictive stage) augmented by an optimal number of regional centres (for geomagnetic storms and ionospheric disturbances at the observation stage). The meeting agreed that the roles, requirements and capabilities of the global and regional centres (together with the optimal number of centres) had not been fully elaborated. The meeting agreed therefore that further consideration should be given to the aforementioned, including the development of a process for the designation of global and regional centres, their governance (including cost recovery for provision of service and competency standards) and duration of mandate. Furthermore, the overall understanding of how space weather information would be used needed to be elaborated in detail and appropriately reflected in appropriate documentation for space weather.

2.2.9 In view of the foregoing, the meeting agreed to not include the draft initial provisions mentioned above in the draft Amendment 77 to Annex 3 (addressed under agenda item 5.1) in view of the need for the further development of service requirements and capabilities and any additional related guidance material. However, the meeting agreed that ICAO should work towards enabling space weather services for aviation by developing Annex 3 provisions for inclusion in 2018 (i.e. Block 1). The meeting formulated the following recommendation accordingly:

Recommendation 2/7 — Development of provisions for information concerning space weather

That an appropriate ICAO expert group, in close coordination with WMO, be tasked to develop provisions for information on space weather to international air navigation consistent with the *Global Air Navigation Plan* (Doc 9750), including the integration of the information produced into the future system-wide information management (SWIM) environment underpinning the future globally interoperable air traffic management system, specifically addressing:

- a) requirements for space weather information services consistent with the draft concept of operations for space weather information services;
- b) selection criteria and associated capability for the designation of global and regional space weather centres, including the optimum number thereof;
- c) appropriate governance and cost recovery arrangements for the provision of space weather information services on a global and regional basis; and
- d) considerations on the use of space weather information and the various impacts space weather events could have on international air navigation.