

FOUR-YEAR PLAN FOR SPACE WEATHER ACTIVITIES

Status of actions and recommendations from previous meetings

(Submitted by the Secretariat)

Summary and Purpose of Document

The document summarizes the status of actions and recommendations agreed at ICTSW-4 in November 2013, for the purpose of monitoring the progress made.

These on-going actions should also be noted as background information when discussing the four-year activity plan.

ACTION PROPOSED

The Inter-Programme Coordination Team is invited to:

- Review the status of actions and recommendations;
- Consider the consistency between the outstanding actions and the draft four-year plan;
- Take measures to complete the outstanding actions, or decide to close or amend them, as appropriate.

STATUS OF ACTIONS AND RECOMMENDATIONS FROM ICTSW-4
 Extracted from http://www.wmo.int/pages/prog/sat/documents/ICTSW-4_FinalReport.pdf

I. STATUS OF ACTIONS AS OF OCTOBER 2014

Action	Status (October 2014)
Action 4.1: All ICTSW members to review and check that the actual contents of the SOG are current (check any gap or risk that was overlooked or that has emerged in the meantime) and report to the co-chairs and the Secretariat (jlafeuille@wmo.int). (30 June 2014)	On going. Updated version to be provided at ICTSW-5 for approval.
Action 4.2: In particular, all ICTSW members to check and report if the observations they are aware of at the national level are fully reflected in the proposed addition to the SOG regarding radiation dose rate, thermospheric wind and density. (30 June 2014)	On-going. The requirements for these new observations need to be checked.
Action 4.3: David Jackson, Terry Onsager, Jérôme Lafeuille to condense the text in Doc. 4.2 Appendix, with a view of its inclusion in the SOG update (31 July 2014).	Completed A condensed draft was prepared in June 2014, and included in the draft updated SOG.
Action 4.4: David Jackson to propose a more precise definition of the Radiation Dose Rate, specifying which part of the energy spectrum is considered. (31 January 2014)	OPEN
Action 4.5: K. Kauristie to draft a 2-page summary of the Statement of Guidance for communication to COSPAR as a contribution to the Space Weather Roadmap (28 February 2014)	Completed (should be communicated to ICTSW for information). The SOG is acknowledged in the COSPAR roadmap.
Action 4.6: All ICTSW members to provide Terry Onsager and Jérôme Lafeuille with comments on the CONOPS Draft Version 2.3. (Due date: 4 December 2013)	Completed.
Action 4.7: T. Onsager and J. Lafeuille to consolidate the ICTSW comments and provide the ICAO Secretariat and Andy Wells with the formal response from WMO on the CONOPS Draft Version 2.3. (Due date: 6 December 2013)	Completed on 6 Dec. Most of these comments were taken into account.
Action 4.8: All ICTSW members to review the draft SARPs contained in ICTSW-4/Doc. 5.2 Rev1 and provide comments to T. Onsager and J. Lafeuille. (10 January 2014)	Completed
Action 4.9: T. Onsager and J. Lafeuille to consolidate the comments from ICTSW on the draft SARPs. (17 January 2014)	Completed
Action 4.10: J. Lafeuille to provide ICAO Secretariat (R. Romero) with the WMO comments on the draft SARPs, after finalization. (24 January 2014)	Completed , through the WMO Working Paper WP/33 submitted for IAVWOPSG/7 (March 2014)
Action 4.11: Terry Onsager to schedule in January 2014 two ICTSW teleconferences on the network organization and functions of space	Completed (9 and 16 January)

weather centres for ICAO. (15 January 2014)	
Action 4.12: All ICTSW Members to review the prototype PAG (http://wmo-sat.info/product-access-guide/) and forward comments on the layout and overall functionality. (10 January 2014)	Closed . Little or no feedback received by January. The PAG is now implemented. See: http://wmo-sat.info/product-access-guide/theme/space-weather
Action 4.13: Jan Janssens and Nils Hettich to coordinate to implement the sunspot cycle in the Space Weather Product Portal. (31 December 2013)	Completed on 7 December
Action 4.14: J. Janssens and Larisa Trichtchenko to lead a discussion to define guidelines for the specifications of regional geomagnetic disturbance products to ensure that future regional geomagnetic products on the portal are comparable. (28 February 2014)	OPEN
Action 4.15: The training strategy team, including Hyesook Lee, Mamoru Ishii, Nicole Vilmer, Xiaoxin Zhang, to select the training material references to be included in the Space Weather Product Portal and recommend how it should be organized in the portal (e.g. according to which topic categories). (31 August 2014)	OPEN
Action 4.16: David Jackson, Mauro Messerotti, Mike Terkildsen, Terry Onsager, Vyacheslav Burov and Xiaoxin Zhang to evaluate, improve, and expand as necessary the set of global and local Space Weather scales in order to ensure efficient and standardized information communication to the users in severe event situations. (30 November 2014)	OPEN
Action 4.17: M. Ishii and J. Lafeuille to investigate whether the RINEX format is currently used on the WMO GTS or WIS for Integrated Water Vapour observations from ground-based GNSS receivers and, if necessary, will recommend to the WMO CBS that the RINEX format – and GTEX once finalized - be recognized for data exchange in the WIS. (28 February 2014)	OPEN
Action 4.18: Xiaoxin Zhang shall investigate whether GNOS RO data will also be used in BUFR format by CMA in addition to the proposed GNOS RO format and report to ICTSW (15 January 2014)	OPEN
Action 4.19: T. Onsager, in coordination with Bill Schreiner, to provide a sample of Formosat-3/COSMIC-1 and Formosat-7/COSMIC-2 data formats for comparison with the data formats used by the NWP community (15 February 2014).	OPEN
Action 4.20: All ICTSW members to review the Appendices to Doc 9.1, complete as appropriate the list of ground-based observation networks, update the links to relevant information sources and inform Larisa Trichtchenko (30 June 2014).	On-going.
Action 4.21: ICTSW members shall review the proposed typology of “layers” and “coverage” included in Doc. 9.3(1) and provide comments to the WMO Secretariat (30 April 2014)	OPEN
Action 4.22: Alain Hilgers will lead a further review of the instrument categorization in OSCAR and of the association between instrument	OPEN

classes and variables, and will suggest modifications as necessary for consideration by the WMO Secretariat (J. Lafeuille). (31 March 2014)	
Action 4.23: The ICTSW co-chairs to coordinate the preparation of an outline of a Space Weather Watch (SWW) proposal, providing a reasonable description of the planned SWW proposal, in advance of EC-66 in May 2014. (28 February 2014)	OPEN
Action 4.24: T. Onsager (as ICTSW Co-chair and ISES Director) and J. Lafeuille to clarify with the WMO and NOAA legal counsels whether ISES is eligible for a MoU or a working arrangement should be concluded in an equivalent form, and proceed towards the signature of this MoU or other arrangement by WMO and ISES. (30 April 2014)	COMPLETED A MoU is possible but an exchange of letters is found appropriate
Action 4.25: The training strategy team, including Xiaoxin Zhang, Mamoru Ishii, Nicole Vilmer, Hyesook Lee, will propose a training approach for discussion at ICTSW-5. (31 October 2014)	OPEN
Action 4.26: ICTSW members to review the material contained in Doc. 12(2) in their respective areas of expertise and report any correction or addition needed. (28 February 2014)	COMPLETED Input received from T. Onsager and M. Messerotti. The new CIMO Guide is finalized and approved by CIMO, but still open for public comments : http://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/Provisional2014Edition.html
Action 4.27: Xiaoxin Zhang, Matt Francis, Martin Zurn (designated by Neil Mitchison), Norbert Jakowski shall liaise with the Space Weather subgroup of the IROWG (Point of contact: Anthony Mannucci, NASA/JPL) for the preparation the workshop on atmosphere and ionosphere applications planned with the 2014 COSMIC/Formosat Data Users Workshop in Boulder (See background in Doc. 9.2).	COMPLETED The "ionosphere-atmosphere coordination workshop" will be held in UCAR on October 3 rd , after the 8 th COSMIC Data Users' Workshop. http://www.cosmic.ucar.edu/workshop_2014/index.html
Action 4.28: The ICTSW co-chairs to set up a task team in charge of developing a plan to address space agencies and space weather service-providing agencies at the proper level for programmatic issues regarding the long-term continuity of essential space weather satellite observations (including future L1 missions, missions to other heliospheric locations, coronagraph measurements, and heliospheric imaging), advocating for both space-based and ground-based, including both long-term continuity and immediate availability. (31 January 2014)	OPEN
Action 4.29: T. Onsager, M. Ishii to contact IPET-MDRD to determine schedule for updates to the WMO metadata profile and make sure that space weather considerations are addressed in a satisfactory manner, noting that ICTSW was invited to contribute to revise the metadata profile. (15 January 2014)	OPEN
Action 4.30: Xiaoxin Zhang, Mamoru Ishii and T.Tsugawa, Mike Terkildsen, David Jackson, Hyesook Lee, to investigate the modalities of ground-based GNSS network data exchange for NWP (as	OPEN

discussed at the NAEDEX-APSDEU meetings) and for ionospheric monitoring (as discussed within e.g. IGS), and evaluate if the data from the GNSS sites used for NWP could also be made available (or already are available) for space weather applications. (31 August 2014)	
Action 4.31: All ICTSW members to investigate possibilities of their organization providing a seconded expert to WMO to support space weather and ICTSW activities, and/or financial resources to a WMO trust fund for these activities. (31 March 2014)	OPEN
Action 4.32: WMO to send a letter to all WMO Members involved in ICTSW encouraging them to second staff to support the work ICTSW and thus leverage the benefits of ICTSW activities. (31 January 2014)	OPEN
Action 4.33: X. Zhang, T. Onsager and J. Lafeuille to update the ICTSW work plan for 2014-2015 by 31 January 2014.	To be closed. Superseded by the 4-year activity plan
Action 4.34: V. Burov, X. Zhang, T. Onsager and J. Lafeuille to coordinate the preparation and invitation for the next ICTSW meetings (20 February 2014).	COMPLETED An ISES meeting was held in Moscow, with participation of ICTSW members. The ICTSW-5 is convened in Ispra.

II. RECOMMENDATIONS

Recommendations
Recommendation 4.1: All Members involved in ICTSW to communicate at the governmental level on space weather impacts and on the benefits of space weather services.
Recommendation 4.2: To advocate the importance of space and ground-based observations, as documented in the SOG; this advocacy effort should be directed towards the current operators of space- or ground-based observing capabilities as well as towards potential new operators.
<p>Recommendation 4.3 : ICTSW should work along the following lines in support of severe space weather event warning:</p> <ul style="list-style-type: none"> • Encourage all countries to include space weather risk into their national multi-hazard warning schemes; • Identify/select proper indices (R, S, G, DIX, W,...) to characterize the severity of the events, and define levels above which specific procedures should be activated; • Establish a real-time communication mechanism among warning centres to share urgent technical and informal information, cross-verify forecasts, keep each other informed of the press/media accounts about extreme events (taking into account the need to be efficient in an emergency context); exercise such communication mechanisms under test conditions; • Develop a “manual of best practices” to deal with severe/extreme events; in particular, the manual should define a standard set of products in concise formats including for instance a risk index in a space weather hazard scale; • Conduct post-event analyses and statistics to refine the capabilities and to document the reliability of the warnings issued.
Recommendation 4.4: The ICTSW recommends the finalization of the GTEX format by ITU and ultimately its use for the exchange of TEC slant data.

Recommendation 4.5: The ICTSW should express a recommendation on the use of BUFR and GRIB for space weather data in the light of the pilot activities when completed.
Recommendation 4.6: ICTSW, as the CBS expert body on the subject matter, unanimously supports the application of NICT as a DCPC for space weather.
Recommendation 4.7: All space weather regional warning centres are encouraged to register as a DCPC in the WIS.
Recommendation 4.8: NICT, BOM to pursue the WIS demonstration actions on the four selected products and their BUFR encoding with a view of distributing these products through the WIS.
Recommendation 4.9: In the light of the WIS pilot project, ICTSW should further discuss whether there is a need and/or advantages to migrate products from current ISES codes to e.g. BUFR.
Recommendation 4.10: The list of variables should be reviewed with the aim to have independent, technology-free quantities with consistent definitions and units (31 March 2014)
Recommendation 4.11: ICTSW recommends to put emphasis in OSCAR on operational observation capabilities, for instance taking advantage of the filter function (R&D or Operational agencies) and/or of the "Capability review" function which allows assessing the gaps with respect to a pre-defined reference constellation.
Recommendation 4.12: Continue and update the review of international initiatives and potential partnerships contained in Appendices to Doc. 10.3.
Recommendation 4.13: Utilize the new Space Weather agenda item to promote awareness and coordination of data needs within COPUOS.
Recommendation 4.14: Research to operations. Engage research organisations to ensure their research activities are extended to research to operations activities. An example would be to lobby for extension of ISWI to make new ISWI observations suitable for operational use.
<p>Recommendation 4.15: CGMS should engage in space weather activities:</p> <ul style="list-style-type: none"> • to promote a strategy to ensure the long-term continuity of space weather observations, in coordination with WMO and other international organizations; • to coordinate the acquisition and availability of space weather observations made by meteorological satellites; • to jointly define with ICTSW a strategy to improve the collection, availability, and uses of satellite anomaly information; • to express its requirements for space weather products and services to satellite operators and to provide feedback on the value of available products.
Recommendation 4.16: The focus of space weather educational activities (mainly organised by ISWI and SCOSTEP) should be extended from research to operational activities. This may include: producing training materials on WMO ICTSW website (See Action 4.15 above); expanding the scope of SCOSTEP and other workshops to include research to operations; WMO, ISES or CGMS running operational space weather workshops.
Recommendation 4.17: ICTSW should define a training strategy identifying the target audiences, the intended focus (subjects and training goals), the key partnership opportunities to be exploited such as VLab and COSPAR, and including a plan to develop training material, or select existing training material.
Recommendation 4.18: T. Onsager, in the context of ISES, and J. Lafeuille, at the WMO Executive Council, should encourage full participation of ISES members in ICTSW (e.g. India, Austria, ...)
Recommendation 4.19: All members contributing to the Space Weather Product Portal to maintain consistency of their web pages with the ICTSW agreed standards.