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**Committee on the Peaceful
Uses of Outer Space**
Scientific and Technical Subcommittee
Fifty-second session
Vienna, 2-13 February 2015
Item 10 of the agenda: Space weather

**First Meeting of Space Weather Expert Group on
4 February 2015:**

**Report on Proposed Mandate and Work Plan of the Space
Weather Expert Group**
Dr Ian Mann, Rapporteur

Executive Summary

A space weather workshop was organized on the margins of the 52nd session of the Scientific and Technical Subcommittee (STSC) of the United Nations Committee on the Peaceful Uses of Outer Space on 3 February 2015. The Workshop enabled member States and their experts to review the current activities in member States and related national and international organizations. This workshop provided the appropriate background which was used to inform discussions defining a proposed mandate, scope and future work plan for the Expert Focus Group. This was developed during the first meeting of the Space Weather Expert Group held on the margins of the STSC on 4 February 2015.

A consensus was reached at the meeting of the Expert Group on Space Weather on the mandate and the plan of work which will be presented to the STSC at its 52nd session for approval.

Mandate

The mandate of the Space Weather Expert Group is to promote awareness, provide guidance, and enable communication and cooperation in space weather related activities among States members of the Committee and related national and international organizations.



Work Plan

1. Examine the report and conclusions of the LTS Expert Group C on space weather (A/AC.105/C.1/2014/CRP.15)) and other information related to space weather including the recent report from the COSPAR-ILWS Roadmap team “Understanding Space Weather to Shield Society”. The group will examine the guidelines, recommendations and best practices to identify mechanisms to promote their implementation, including an assessment of prioritization. [year 1]
2. Complete an inventory of relevant United Nations organizations, including the World Meteorological Organisation (WMO) and International Civil Aviation Authority (ICAO) and others, and those within States members of the Committee and national and international organizations. Identify and assess their role in the global space weather effort, promote coordination and communication between them, and ensure that the efforts of STSC are complementary. [years 1-2]
3. Recognizing the impacts of space weather, the group will promote increased and expanded member State involvement in providing space weather monitoring, from the ground and in space, and in developing, advancing, and sharing and delivering space weather services. [years 2-4]
4. The group will report yearly to the STSC on its progress, on important issues which have been identified, and where specific action is recommended. The group will also make a recommendation for its continuing and future work plan.

Some background to the activity, and a report on the first Expert Group are also provided for information below.

I. Background and vision

Under the Working Group on the Long-Term Sustainability of Outer Space Activities (LTS), four Expert Groups (EG) completed work and provided reports and recommendations to the Chair of the LTS working group and member States.

Among the issues addressed by the LTS working group; measures to control space debris are covered by the Inter-Agency Debris Committee (IADC) and COPUOS Debris Mitigation Guidelines (ST/SPACE/49); and threats related to Near-Earth Objects are addressed by Action Team 14 as well as the recently created International Asteroid Warning Network (IAWN) and Space Mission Planning Advisory Group (SMPAG). In contrast, despite the growing understanding of both the likelihood and severity of its impacts, there is no similar process for space weather within COPUOS to take stock of and develop activities targeting the mitigation of the risks relating to space weather. The STSC does, however, have a standing agenda item on space weather which could be used to address the coordination of actions and strategies of member States in this regard.

In this context, the Committee, at its fifty-seventh session, endorsed the recommendation of the Science and Technical Subcommittee (STSC) to set up an expert group with a rapporteur under the agenda item on space weather. Drawing on the best practices of the work of expert group C on space weather of the Working

Group on the Long-term Sustainability of Outer Space Activities, a programme of work will be considered at the fifty-second session, in 2015 (A/AC.105/1065, annex I, para. 10).

Space weather is an intrinsically international issue, where expertise, monitoring, and forecasting capabilities developed by multiple nations will benefit from improved coordination. This is especially relevant for filling key measurement gaps, securing the long-term continuity of critical measurements, and for advancing global forecasting capabilities.

There is a clear need to foster more synergy and promote the convergence of common interest among member States for space weather. It is envisioned that the expert group would enable further collaborative engagement of member States, inter-governmental and non-governmental organizations and could propose tangible and long lasting options for ensuring coordination and actions consistent with securing the long-term sustainability of outer space and ultimately for mitigating the effects and impacts of space weather for the benefit of member States and humanity.

II. Report on First Meeting Space Weather Expert Group

The Expert Group met for the first time on the 4 February 2015 on the margins of the 52nd session of STSC, following the previous days U.S. organized Workshop on “Space Weather Services to Build Global Resilience” whose presentations informed the discussion at this first meeting of the new United Nations Space Weather Expert Group. The goal of the Expert Group meeting was *“to establish a proposal for consideration by the Scientific and Technical Subcommittee (STSC) of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) at its fifty-second session in February 2015 of the Terms of Reference, Scope and initial Schedule of Work for an Expert Group on Space Weather, and whose work will be completed and approved annually under the Space Weather agenda item of STSC.”*

Discussion at the Expert group provided the basis to develop a proposed mandate and focus for the future work of the Expert Group. Significant attention was devoted to determining an appropriate specific focus for the Expert Group which was defined as follows: To promote awareness, communication, and provide guidance and enable cooperation in space weather related activities. Importance was also placed on ensuring the work of the Expert Group lead to specific actions and definite outcomes, including ensuring that the work of this COPUOS Expert Group was complementary to other space weather coordination activities such as those within the WMO, ISES, COSPAR, ILWS, ICAO etc.

Discussions included topics on:

- Relationship and role of COPUOS Expert Group in relation to other international efforts (e.g., within WMO, ISES, COSPAR, ILWS, ICAO, etc.).
- Coordination and/or Cooperation and/or Exchange of information about Space Weather activities and services in member States
- Promotion of increased recognition of the importance of, and increased participation in, international space weather endeavour within COPUOS member States.

- Increased communication between nations with active space weather services and/or space weather monitoring on the ground and/or in space
- An opportunity at Member State delegation level to promote efforts to quantify the level of national threat, and promote the importance of policies facilitating improved resilience against space weather.
- Providing a framework which encourages Member State delegations to develop policy which supports space weather implementation being addressed elsewhere in the United Nations and other administrations e.g., WMO, ISES, ICAO etc.
- Broadening the international consensus and action in relation to mitigation of space weather effects
- Promoting space weather monitoring and activities in existing and future space-faring nations in developed and developing nations
- Promote new data collection on ground and in space in Member States, especially in relation to identified gaps.
- Communication and coordination activities in relation to improved international space weather forecasts
- The future role of the International Space Weather Initiative and its relationship to the COPUOS Space Weather Expert Group?
- How to promote and expand new member State involvement in space weather activities?

The Expert Group decided that its initial task would extend the work completed by the United Nations Long-Term Sustainability (LTS) of Outer Space Activities Expert Group C, and focus on the steps towards implementation of Draft Guidelines and Best Practices for Space Weather defined by Expert Group C.

The Space Weather Expert Group will capture information, review and analyse practices and initiatives in support of maintaining effective coordination among member States towards the mitigation of damaging space weather effects. This will include work in order to: identify gaps; propose solutions; and provide orientation for the future work of the STSC, focusing initially on developing mechanisms for international space weather coordination, and promoting wider and increased involvement of member States in the global space weather endeavour.

The group could: (i) review the content, structure and organization of ongoing efforts in the field of space weather; (ii) identify where additional coordination may be required or appropriate and/or identify opportunities and areas for additional contributions by member States, international intergovernmental organizations and non-governmental organizations; (iii) propose steps to enhance space weather coordination with specialized bodies, including United Nations Agencies (e.g. activities of the World Meteorological Organization –WMO, and within the International Civil Aviation Authority (ICAO), etc.), and facilitate collaboration with other space weather initiatives; (iv) promote the importance and scope of space weather impacts on technology infrastructure, and encourage the completion of space weather impacts and socio-economic effects studies in Member States. The

group may also address specific requests and questions that the Sub-Committee may direct to its attention.

Communication between space weather stakeholder entities was also thought to be of significant importance, and the Expert Group meeting discussed the value of potential workshops and sharing of information between member States in relation to space weather, perhaps including a dedicated web based resource. Significant importance was also attached to the completion of space weather impact studies, and the work completed for example by the United Kingdom has demonstrated the value for highlighting the important impacts of space weather and for taking steps to mitigate their damaging effects. It was also highlighted that space weather endeavours span all the aspects of science, applications, and outreach and capacity building and as such communication between the relevant actors is essential for the efficient use of resources. The group was informed that WMO had developed a four-year plan for space weather coordination activities aiming to enable, improve and deliver operational space weather services, in particular in response to the ICAO requirements for space weather services to air navigation. It encouraged this initiative which is expected to be an important contribution to the objectives of the expert group.

Consistent with the conclusions of the LTS Expert Group C, the first meeting of this Expert Group also highlighted the importance of space weather in relation to space debris and for the accurate prediction of the re-entry trajectories of objects from their space orbits. Finally, the success and achievements from the International Space Weather Initiative (ISWI) in promoting data collection and in promoting space weather activities in developing nations was also highlighted. The future of the ISWI program will be discussed at an upcoming United Nations sponsored workshop on space weather in Fukuoka, Japan, and this workshop can examine the potential future role and value of the ISWI legacy and measurements to future global space weather activities.

By holding meetings on the margins of the STSC, the group will provide a forum for member States, international intergovernmental organizations, non-governmental organizations and their respective experts to share information and best practices, needs and vision to enable and ensure sufficient space and ground-based resources are coordinated and directed to mitigating the damaging effects of space weather. Such forum will also serve to promote a wider appreciation of the importance of space weather, of potential threats, and would promote increased and expanded member State involvement in providing space weather monitoring, from the ground and in space, and in developing and delivering space weather services. Additional meetings of the Expert Group may also be organized either by teleconference, or at additional venues as appropriate perhaps utilizing opportunities provided as side meetings at other space weather or space science meetings and/or conferences.

By reporting to the STSC through the agenda item on space weather, the Space Weather Expert Group will increase awareness, engagement and promote collaborative efforts among member States on this topic while focusing their energy towards achieving tangible and long-lasting results. The Expert Group will also aim to define action lists, updated and/or revised on at least an annual basis through which it will seek to promote appropriate action towards implementation of guidelines, best practices and other activities dedicated towards space weather requirements.