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# Overview of COPUOS LTS Expert Groups

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**Regional Workshop on the Long-term Sustainability of  
Space Activities**

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# UNCOPUOS

- UN COPUOS (Committee on the Peaceful Uses of Outer Space) is the primary international forum for the development of laws and principles governing activities in outer space.
- founded in 1959 by 24 Member States
- Legal Subcommittee (LSC)
- Scientific and Technical Subcommittee (STSC)

# Space Sustainability in COPUOS

- STSC
  - Space debris
  - Use of NPS in outer space
  - Use of GEO
  - Space weather
  - Long-term sustainability
- LSC
  - Application status of UN space Treaties
  - Review of Principles on use of NPS in space
  - Capacity building in space law
  - National mechanisms relating to space debris
  - National legislation on peaceful uses of space

# Space Sustainability in COPUOS

- UN COPUOS Space Debris Mitigation Guidelines
- UN COPUOS/IAEA Safety Framework for Nuclear Power Source Applications in Outer Space.
- **WG on Long-Term Sustainability of Outer Space Activities of the STSC**

# WG on Long-Term Sustainability of Space Activities (LTS)

- The objective of the Working Group is to examine and propose measures to ensure the safe and sustainable use of outer space for peaceful purposes, for the benefit of all countries.
- Examine the long-term sustainability of outer space activities in the wider context of sustainable development on Earth.
- Take into consideration current practices, operating procedures, technical standards and policies associated.
- Legal framework: the existing United Nations treaties and principles governing the activities of States in the exploration and use of outer space.

# Outputs of the WG LTS

- **Report on the long-term sustainability**
  - current best practices
  - operating procedures
  - technical standards
  - policies for safe conduct of space operations
- **Voluntary recommended guidelines**
  - reduce collectively the risk to space operations
  - ensure that all countries are able to have equitable access to the limited natural resources of outer space
- Non-binding recommendations
- Ultimate goal: **National laws** based on the guidelines

# Work Scheme

- Four Expert Groups
  - a) Sustainable space utilization supporting sustainable development on Earth (expert group A);**
  - b) Space debris, space operations and tools to support collaborative space situational awareness (expert group B);**
  - c) Space weather (expert group C);**
  - d) Regulatory regimes and guidance for actors in the space arena (expert group D)**
- Expert Groups meet on margins of COPUOS STSC and main committee meetings and at other agreed times.



# Work Scheme

- Experts are nominated by
  - Member States
  - Inter-governmental organisations with PO status with COPUOS
- Number of experts in each group:
  - A ~ 40
  - B ~ 70
  - C ~ 40
  - D ~ 50
- Additional inputs are received from
  - International organisations (e.g. IAA, IADC, CCSDS, etc)
  - Non-governmental organisations
- Points of contact for the WG by 36 Member States and 5 intergovernmental organizations

# Work Scheme

- Expert Groups met formally in 2012, 2013 and 2014 on the margins of sessions of the STSC and the COPUOS in Vienna, Austria.
- Informal consultation meetings on the margins of the International Astronautical Congress 2011, 2012 and 2013.
- Electronic exchanges of information
- Dedicated web page established by the LTS WG
- Work done intersessionally
- Inputs received from States and consulted with other expert groups on cross-cutting issues
- Workshops organized by the WG in the margins of STSC, where representatives of national nongovernmental organizations and private sector entities, having experience in space activities, provided information on their experiences and practices in the conduct of sustainable space activities.

# Expert Group A

## Sustainable Space Utilization Supporting Sustainable Development on Earth

- Co-chairs: Filipe Duarte Santos (Portugal), Enrique Pacheco Cabrera (Mexico)
  - The contribution of space science and technology to sustainable development on Earth
  - The concept of sustainable development extended to the domain of outer space
  - Equitable access to the limited resources of outer space benefits of space activities
  - International cooperation in peaceful uses of outer space as a means of enhancing space sustainability and supporting sustainable development on Earth

# Findings

- Space activities should have minimal negative impact on the Earth or on the space environment.
- Promotion and development of technologies that minimize the environmental impact of launching space assets and maximize the use of renewable resources and the reusability or repurposing of existing space assets.
- Information-sharing and education raise the profile of sustainable space utilization.
- International coordination and cooperation is needed to ensure that radio-frequency spectrum is used in a rational and equitable manner.
- Ensure that countries or groups of countries have equitable access to radio frequencies.
- Ensure space activities conducted to prevent harmful interference with the space activities of other States and intergovernmental organizations.
- Improve measures for resolution when in cases of harmful interference.

# Expert Group B

## Space Debris, Space Operations and Tools to Support Collaborative Space Situational Awareness

- Co-chairs: Richard Buenneke (USA), Claudio Portelli (Italy)
- Space debris:
  - Measures to reduce the creation and proliferation of space debris
  - Collection, sharing and dissemination of data on space objects
  - Re-entry notifications regarding substantial space objects
  - Technical developments and possibilities regarding space debris removal
- Space operations:
  - Collision avoidance processes and procedures
  - Pre-launch and pre-manoeuvre notifications
  - Common standards, best practices and guidelines
- Tools to support collaborative space situational awareness:
  - Registries of operators and contact information
  - Data centres for the storage and exchange of information on space objects and operational information

# Findings

- Increasing number of orbital objects is deteriorating the space environment despite the implementation of internationally agreed debris mitigation standards and guidelines.
- Debris hazard analyses:
  - a) risk of deterioration or termination of a space mission, impact of a sub centimeter debris object
  - b) risk of a catastrophic break-up due to the collision of a large, intact object with an object large enough to be catalogued (debris or intact).
- Space Debris Mitigation Guidelines of the COPUOS, in 2007.
- Other references:
  - IADC Space Debris Mitigation Guidelines,
  - European Code of Conduct for Space Debris Mitigation,
  - Standard 24113:2011 (Space systems: space debris mitigation requirements) of the ISO.

# Findings

- Need to combine capabilities in monitoring of objects in orbit.
- The technologies for monitoring are no longer financially costly and are available to all interested States,
- widest possible participation in studying man-made debris in near-Earth space.
- Lack of standard approaches to representing measurement data.
- No international mechanism for exchanging verified information that, using the same methodological approach,
- Differences in the accuracy of orbital data
- Conjunction Assessment

# Expert Group C

## Space Weather

- Co-chairs: Takahiro Obara (Japan), Ian Mann (Canada)
  - Collection, sharing and dissemination of data and forecasts
  - Capabilities to provide a comprehensive and sustainable network of sources of key data in order to observe and measure phenomena related to space weather in real or near- real time
  - Open sharing of established practices and guidelines to mitigate the impact of space weather phenomena on operational space systems
  - Coordination among States on ground-based and space-based space weather observations in order to safeguard space activities



# Findings

- Needs in space weather:
  - Improved coordination to support and promote the collection, archiving, sharing, intercalibration and dissemination of critical space weather data
  - More advanced space weather models and forecast tools in support of user requirements
  - Coordinated sharing and dissemination of space weather model outputs and forecasts.
- Support and promote the collection, sharing, dissemination and access to information relating to established practices for mitigating the effects of space weather on terrestrial and space-based systems and related risk assessments.

# Expert Group D

## Regulatory Regimes and Guidance for Actors In the Space Arena

- Co-chairs: Sergio Marchisio (Italy), Anthony Wicht (Australia)
- Regulatory regimes:
  - Adherence to existing treaties and principles on the peaceful uses of outer space
  - Review of the regulatory framework and the tools for the use and transfer of space technologies within international cooperation and international turnover of controlled space-related goods
  - National regulatory frameworks for space activities
- Guidance for actors in the space arena:
  - Technical standards, best practices and lessons learned for the successful development and operation of space systems, from the pre-launch phase to the end- of-life phase
  - Technical and legal capacity-building for developing countries

# Findings

- National regulatory frameworks promote behaviours that enhance the long-term sustainability of outer space activities.
- Encourage advisory input from participants in space activities likely to be affected by any regulatory developments
- Increasing awareness of issues relating to the long-term sustainability of outer space activities.
- Communication within relevant regulatory bodies can promote regulations to ensure that regulatory outcomes are as intended.
- Existing international standards and recommended practices can complement regulation.
  - standards published by ISO
  - the Consultative Committee for Space Data Systems
  - Recommended practices published by IADC and the Committee on Space Research (COSPAR).

# Draft Guidelines and Reports

- The expert groups considered inputs received from States members of the Committee, international intergovernmental organizations and non-governmental entities
- considered current practices, operating procedures, technical standards and policies associated with the safe conduct of space activities
- Expert group A proposed 7 candidate guidelines (A/AC.105/C.1/2014/CRP.13).
- Expert group B proposed 8 (A/AC.105/2014/CRP.14).
- Expert group C proposed 5 (A/AC.105/C.1/2014/CRP.15).
- Expert group D proposed 11 (A/AC.105/C.1/2014/CRP.16).
- 2 guidelines proposed by the Chair of the WG.
- Total of 33 guidelines (A/AC.105/C.1/L.339).

# Draft Guidelines and Reports

- Consolidated draft guidelines including proposal submissions of:
  - Russia – 2
  - Switzerland -1(A/AC.105/C.1/L.340)
- The expert groups have finished their reports and the discussion of the draft guidelines is now being held in the LST WG
- By 2015 additional proposals to the guidelines have been made by:
  - USA – 1
  - Russia – 8
  - Several amendments by a number of Member States
- **Still work in progress**

# Process Summary

- 2011
  - Terms of Reference and Methods of Work adopted
  - Expert Groups established
- 2012
  - First COPUOS Long-Term Sustainability Workshop
  - WG and Expert Groups commence work and refine list of topics to discuss,
  - Identify overlaps and gaps
  - Begin to identify candidate guidelines
- 2013
  - Second COPUOS Long-Term Sustainability Workshop
  - Practices and experiences of non-State actors
  - Candidate guidelines discussed
  - Expert Groups draft reports
- 2014
  - **Finalization of the Expert Group Reports**
  - Development of Working Group Draft Report and Guidelines
- 2015
  - Deadline for new guideline proposals
  - First meeting of Space Weather Expert Group, work plan presented

# Thank you!

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