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Information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities

Note by the Secretariat containing replies from CANEUS
International, the Hague Institute for Global Justice and the
National Space Society

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II. Replies received from organizations

CANEUS International

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[3 April 2023]

CANEUS International welcomes this opportunity to present inputs for consideration at the meetings of the Working Group on the Long-term Sustainability of Outer Space Activities to be held during the sixty-sixth session of the Committee on the Peaceful Uses of Outer Space, in June 2023, and at the workshop planned for 2024 (see [A/AC.105/1258](#), annex II, appendix, para. 18).

Specifically, CANEUS would like to request the creation of a focus group on “Space science and technologies for Indigenous peoples’ knowledge and practices” at the session of the Committee in June 2023 and the related dedicated session or sessions at the workshop in 2024.

CANEUS has been cooperating with the Office for Outer Space Affairs of the Secretariat and several member States of the Committee on the Peaceful Uses of Outer Space, regarding the use of emerging Earth observation-based solutions, which are relevant to serving the needs of the global Indigenous communities.

There is a need to examine and identify challenges and barriers for Indigenous communities in implementing workable and replicable solutions based on emerging space technologies. For example, the spatial and temporal nature of space-based information provides a better understanding of a situation and influences the decision-making process to help research, policies and programmes.

Therefore, CANEUS, with the support of the Office for Outer Space Affairs, the Fund for the Development of Indigenous Peoples of Latin America and the Caribbean, and global Indigenous stakeholders, created the Global Research Initiative and Knowledge Repository to integrate Indigenous knowledge into efforts to achieve the Sustainable Development Goals by using Indigenous knowledge to develop a digital infrastructure known as the Indigenous Knowledge Research Infrastructure.

This partnership was launched in 2021 at the United Nations Food Systems Summit and is aimed at restoring and preserving Indigenous knowledge to bring long-term socioeconomic benefits to society. The Indigenous Knowledge Research Infrastructure compiles information that is currently scattered and allows more food systems to incorporate Indigenous knowledge and techniques.

One of the key aspects of this initiative is to leverage the power of Earth observation and frontier technologies to support the conservation of Indigenous people’s habitats and conserve Indigenous knowledge and practices in the interest of building resilient food systems. Otherwise, we are at risk of losing this knowledge given the current pace of development.

These joint efforts are designed and developed to support the One United Nations approach. As may be noted from the related publications, the Office for Outer Space Affairs has been the key partner and supporter in advancing the Indigenous Knowledge Research Infrastructure initiative:

- https://caneus.org/4_CANEUS_UNOOSA_GAR2-22.pdf
- https://caneus.org/2_CANEUS_UNOOSA_IKRI_UN-IATT_2022.pdf
- https://caneus.org/3_Di_Pippo_IKRI_UN_ECOSOC2022.pdf
- https://caneus.org/1_CANEUS_UNOOSA_UN_ATT_2021.pdf

Thus, CANEUS would very much welcome leadership from the Working Group and its Chair in this important and timely initiative.

Hague Institute for Global Justice¹

[Original: English]
[27 March 2023]

The Washington Compact on Norms of Behavior for Commercial Space Operations

General Assembly resolution 76/3, entitled “The ‘Space2030’ Agenda: space as a driver of sustainable development”, recognizes that space systems are vital to sustainability, economic growth, scientific discovery and the betterment of the human condition. Furthermore, it underscores the importance of fulfilling the “Space2030” Agenda through global partnerships and strengthened cooperation among Member States, United Nations entities, intergovernmental and non-governmental organizations, industry, and private sector entities that take advantage of the practical experiences and contributions of different stakeholders.

The Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Use of Outer Space suggest that the management of entities that conduct outer space activities establish structures and procedures for planning and conducting space activities in a manner that supports the objective of promoting the long-term sustainability of outer space activities. The Guidelines further state that such entities should establish and foster an organizational commitment to promoting the long-term sustainability of outer space activities within the entity, as well as in relevant interactions with other entities, and the Guidelines encourage the sharing of the experiences of such entities in the conduct of safe and sustainable outer space activities as a contribution to enhancing the long-term sustainability of outer space activities.

It is in this spirit that the Hague Institute for Global Justice has created The Off-World Approach as the first comprehensive platform for civil society actors to share their views and take actions with regard to the future of the space enterprise.

The Off-World Approach has produced the first civil society-generated set of high-level commitments undertaken on a voluntary basis by signatories and which are applicable to their outer space activities in Earth orbit and on the surface and subsurface and in the orbit of the Moon and other celestial bodies. This landmark instrument draws on the six decades of experience in space exploration at all levels and in all sectors and applies it to a new paradigm in governance for commercial space activities.

The Institute presents the Washington Compact on Norms of Behavior for Commercial Space Operations (the Washington Compact).

The Washington Compact is an unprecedented document generated by civil society to guide its presence in space. Non-governmental entities and leading personalities in the space arena developed the Compact as a means of ensuring the orderly and transparent use of space for the benefit of the global community.

The Washington Compact is universal, with signatories from Africa, the Asia-Pacific region, Eastern Europe, Latin America, North America and Western Europe.

Civil society unquestionably plays a central role in shaping the future of the space enterprise, and that role must be incorporated at all levels. Indeed, article VI of the Outer Space Treaty enshrined the principle that activities could be undertaken in outer space by non-governmental entities with “authorization and continuing supervision by the appropriate State party”.

¹ The full text of the submission was made available, in English only, during the sixtieth session of the Scientific and Technical Subcommittee, in February 2023, as a conference room paper (A/AC.105/C.1/2023/CRP.27).

The Treaty offers no opinion as to what constitutes “authorization” or “continuing supervision” and how these functions are to be executed under national law. Nor does it specify the activities that are to be covered. In other words, nations are free to determine their own ways and means of authorization and continuing supervision, and non-governmental entities are free to choose what activities to pursue in space. Article VI allows for non-governmental entities not only to engage in space activities but also to choose the governance mechanisms (contracts or voluntary associations) they might want to employ with other non-governmental entities for transnational commercial ventures.

Bearing this in mind, the Washington Compact offers a framework through which non-governmental entities could cooperate in activities related to the Moon and other celestial bodies and is offered by the Institute as a contribution to the global space economy.

The Institute offers the Washington Compact as a tangible contribution to the implementation of the “Space2030” Agenda and the Guidelines for the Long-term Sustainability of Outer Space Activities.

The Institute’s full submission on the Washington Compact was made available to the Scientific and Technical Subcommittee at its sixtieth session in February 2023.

National Space Society²

[Original: English]
[5 March 2023]

Introduction

It is clear to the National Space Society that there is an urgent need to preserve and protect outer space for future generations. A holistic approach should be taken to ensure the sustainability of the Earth’s orbital environment, cislunar space and the surfaces and orbits of other celestial bodies. Orbital debris, on-orbit servicing, space situational awareness and space traffic management must be considered together in order to properly address the critical aspects of space infrastructure.

Challenges

Implementing the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space will become more challenging as space technology develops, and efforts to sustain our outer space environment must adapt quickly.

The first major challenge in promoting adherence to the Guidelines is that they will have a tangible impact only after implementation by most, if not all, State actors. Several States have already amended existing national regulations or adopted new ones to conform to the Guidelines, but more States must follow and build frameworks to fully enable best practices in space sustainability. If a State has greater “technical and other relevant capabilities” at its disposal, the “greater the emphasis that State should place on implementing the guidelines to the extent feasible and practicable”. In addition, “States without such capabilities are encouraged to take steps to develop their own capacity to implement the guidelines” but are also encouraged to collaborate internationally. The nature of this international collaboration must be further defined to ensure effective cooperative implementation of the Guidelines.

The second challenge is determining the nature of the “policy and regulatory framework for space activities” (see, in particular, guideline A.1). Implementation of the Guidelines should be consistent with the principles and norms of international

² The full text of the submission was made available, in English only, during the sixtieth session of the Scientific and Technical Subcommittee, in February 2023, as a conference room paper (A/AC.105/C.1/2023/CRP.15).

law. In May 2022, the Office for Outer Space Affairs issued a stakeholder report³ based on States' experiences in implementing the Guidelines, in which it was found that "legal certainty is one of the best incentives that a Member State can offer to its space sector". In other words, States would more readily implement the Guidelines if an appropriate legal framework were in place. For example, there should be a framework for orbital debris similar to the law of the sea, which allows for operations to salvage derelict space objects to be undertaken by entities from a State that is not the State of the object's owner. Allowing entities with superior debris removal capabilities to engage in such operations is in the best interests of all spacefaring nations.

The third challenge lies in the broad scope of the Guidelines, which leaves much room for interpretation. That breadth allows actors with vastly different technical capabilities to implement the Guidelines to varying degrees. The value of the Guidelines as an international standard and a tool for coordination could thus be diluted without rigorously defined norms and behaviours.

Fourth, determining the most effective way to ensure private sector involvement and adherence to the Guidelines poses a challenge. Most satellites are owned and operated by private entities, and more megaconstellations are to be launched in the future. The Guidelines only mention the private sector as part of its recommendation for States and international intergovernmental organizations to exchange experience, knowledge and technology with a view to facilitating international cooperation.

Fifth, the Guidelines do not address a broader range of activities such as space resource utilization, lunar activity, human settlement and environmental impacts on the Earth or other celestial bodies. As these are nascent activities, their nature is difficult to anticipate at this time. They should be researched further, and the scope of the Guidelines expanded to take them into account.

Finally, the Guidelines do not take into account a future in which many large-scale deployments and operations of space infrastructure, whether in Earth orbit, on a celestial surface or in deep space, will be developed and owned by multiple States and/or private entities domiciled in multiple State jurisdictions. Selecting one State to be the responsible party with regard to long-term sustainability regulations may be arbitrary and unreasonable.

In the coming years, space activity will include work beyond Earth's orbit and on the surface of other celestial bodies, including the recycling of solid propellant/defunct rocket stages and cislunar metal processing for service vehicles/satellites. These future activities are resource-intensive, and long-term environmental impacts on the lunar surface must be considered, including the use of lunar ice.

The impact of other lunar activities, including resource utilization and human settlement, should be assessed and incorporated into the Guidelines, especially those activities which are commercial in nature and not carried out solely for the purposes of research and science.

Current efforts

Guideline A.1 encourages States to "adopt, revise and amend" their relevant "national regulatory frameworks" to ensure and enhance the long-term sustainability of outer space activities. Some States are already creating and putting frameworks into place that are aligned with Guideline A.1 and are updating them accordingly with new data. Such strategies "ensure the effective application of relevant, generally accepted international norms, standards and practices for the safe conduct of outer space activities".

For example, the regulatory requirements of the United States Federal Communications Commission for the licensing of satellites reflect current efforts to implement the Guidelines. In particular, the Guidelines' intent is reflected in

³ Available at <https://spacesustainability.unoosa.org/content/stakeholder-study-report-2>.

requirements related to how small satellites and small businesses address space sustainability.

Guideline A.3 advises States to establish and maintain all necessary technical competencies required to conduct outer space activities safely and responsibly and enable the entity to comply with the relevant regulatory frameworks, requirements, policies and processes, thus facilitating the long-term sustainability of outer space activities. Some companies are already voluntarily implementing “responsible space initiatives” by developing satellite constellations that minimize the risk of on-orbit collisions and conjunctions and working with Governments and other entities to advance space situational awareness technology.

Guideline D.2 encourages States to “investigate and consider new measures to manage the space debris population in the long term”. Current efforts to manage space debris include extending the operational lifetime of a spacecraft (for example, through on-orbit servicing), novel techniques to prevent collision with debris and other space objects, and advanced measures for post-mission disposal (such as the use of drag sails).

Guideline B.4 advises that “States should encourage entities ... under their jurisdiction and/or control to perform conjunction assessments through national mechanisms”, while guideline B.2 states that States and international intergovernmental organizations should “promote techniques and the investigation of new methods to improve such accuracy [of orbital and other relevant data]”. Entities should also coordinate both domestically and internationally to share and disseminate orbital debris data and “space debris monitoring information” (guideline B.3).

For example, the development of a domestic space object tracking database is currently under way. The data thus acquired can be used and shared to guide the development and implementation of appropriate methods for conjunction assessment during all orbital phases of controlled flight. Together with the pre-launch guidelines on making spacecraft more trackable, the database would ideally become as comprehensive as possible.

Recommendations

Considering the above-mentioned challenges and current efforts, the National Space Society makes the following recommendations for developing and implementing the Guidelines:

(a) The National Space Society suggests that the Working Group on the Long-term Sustainability of Outer Space Activities propose the adoption of a model law – following the example of the Model Law on International Commercial Arbitration adopted by the United Nations Commission on International Trade Law – to ensure the adoption of uniform, comprehensive and globally compatible legal frameworks;

(b) The National Space Society suggests that national regulatory frameworks for the oversight of space activities should be enacted and continuously updated to ensure the implementation of space sustainability practices;

(c) States’ regulations should not be drafted in such a way that they could become a barrier to future space activities that facilitate the sustainability of the space environment. Such regulations should be “efficient in terms of limiting the cost for compliance (e.g., in terms of money, time or risk)”. The National Space Society recommends reviewing the impact of regulations on commercial actors and ensuring that national regulatory frameworks are neither overly burdensome nor prohibitive;

(d) Guideline A.4 addresses recommendations for equitable access to radio spectrum frequency bands:

(i) The National Space Society suggests that the Guidelines should address the possible consequences of harmful radiofrequency interference emphasizing the extent of impact on launches and other spacecraft. For example, if a

satellite's connection with its operating agency is interrupted by another spacecraft, the potential for collisions and the creation of more space debris increases significantly;

(ii) The National Space Society recommends discussing the possible consequences of spectrum interference with all appropriate stakeholders to motivate States, agencies and intergovernmental organizations to continue operating existing spacecraft and use more caution when launching new spacecraft;

(e) The Guidelines recommend that States “develop practical approaches for pre-launch conjunction assessment”. The National Space Society suggests that a national regulatory pre-launch assessment could consist of a review of “design approaches that increase the trackability of space objects” and determine whether the relevant entity “implement[s] applicable international and national space debris mitigation standards and/or guidelines”;

(f) The Guidelines recognize the importance of small-size space objects, especially because of their accessibility for “emerging spacefaring countries”. The National Space Society recommends incorporating the Guidelines into national regulatory frameworks for “the launching and operation of small-size space objects that are difficult to track, in a way that promotes the long-term sustainability of outer space activities”.

Conclusion

Given the ever-expanding number of actors poised to engage in space activities, the existing regulatory framework is not apt to ensure the long-term sustainability of outer space. The Guidelines should be updated to better support the development of frameworks for conducting outer space activities while allowing States the flexibility to adapt such practices and frameworks to their current capabilities. The international community must remember that, just as we care for the environment here on Earth, we must ensure that the space environment is sustained for the generations to come.
