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Open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours

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Consideration of issues contained in paragraph 5 of General Assembly resolution A/RES/76/231

To make recommendations on possible norms, rules and principles of responsible behaviours relating to threats by States to space systems, including, as appropriate, how they would contribute to the negotiation of legally binding instruments, including on the prevention of an arms race in outer space

Reducing Space Threats: Practical Steps Towards a System of Governance in Outer Space

Submitted by The International Institute for Strategic Studies¹

Summary

This report provides recommendations for further work to support the development of norms, rules, and principles of responsible behaviours in outer space, including the development of a glossary of terms, agreeing to an overarching purpose for the rules and norms, improved notification and registration of space objects, development of national space operations centres, development of global space situational awareness, and reorganisation and rationalisation of space governance. The report also recommends specific short-term steps to be undertaken which will support longer-term work to ensure the security, safety and sustainability of the peaceful uses of outer space.

I. Introduction

1. UN General Assembly (UNGA) Resolution 76/231 established the Open-Ended Working Group (OEWG) on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours on 24 December 2021. Focusing on this topic, UNGA tasked the OEWG to take stock of existing relevant frameworks, consider current and future threats in this domain, make recommendations on norms, rules and behaviours to mitigate these threats and to submit a report to the UNGA at the conclusion of these efforts. The OEWG has met twice and now will convene for a third session from 30 January to 3 February 2023. This

¹ This document reflects the conclusions developed from a series of workshops conducted by The International Institute for Strategic Studies to identify the strengths and weaknesses of the UN Open Ended Working Group convened pursuant to the UNGA Resolution 76/231 and to agree upon potential areas of agreement for work and development of steps towards the development of responsible behaviours in outer space. The workshops included government officials from ministries of defence, foreign affairs and space agencies, as well as industry representatives and non-governmental experts in outer space security issues. We are grateful to the UAE Government, Ministry of Foreign Affairs and International Cooperation and Space Agency for hosting a workshop, as well as the other governments and space agencies who participated in this effort.



third OEWG is intended to make specific recommendations towards making progress to realising the aims of the Resolution.

2. This paper is intended to support the work of the OEWG through the description of an overall system of governance for outer space, including norms, rules and principles of responsible behaviours, as well as practical steps that can be taken to help ‘all Member States reach a common understanding of how best to act to reduce threats to space systems in order to maintain outer space as a peaceful, safe, stable and sustainable environment, free from an arms race and conflict, for the benefit of all, and consider establishing channels of direct communication, including for the management of perceptions of threat’.²

II. The Building Blocks of Norms and Rules

3. In order to agree upon norms and rules, Member States must come to agreement on a common set of principles. Based on those principles, norms and rules can be devised which provide the boundaries for acceptable behaviour. Such norms and rules can then provide the basis for stronger measures, including politically and legally binding agreements, as has occurred in the past, such as with the Outer Space Treaty of 1967. Firstly, Member States need to develop a better understanding of outer space threats – including threats to space objects and threats from space objects to Earth – and the potential tools for mitigating these threats and the benefits of cooperation. The OEWG is making progress in this regard, but more can be done.

4. It is not necessary now to agree upon any specific set of mechanisms to begin to better govern behaviour in outer space. However, it is logical and useful to take the first steps towards establishing the necessary foundations for any more complex process which may be agreed in the future. Many of these ideas draw upon previous work on the topic, especially A/68/189 (the Report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities).

A. Development of a Glossary of Terms

5. One of the most fundamental missing pieces of the foundation for defining responsible norms and rules is a common understanding of the terminology involved. Different Member States’ submissions to the OEWG to date have attempted to define some of the terms where an agreed definition is absent, often based either on national terminology or terminology from agreements in other domains (e.g., “proximity operations”). However, there already exists a core of agreed terms in outer space law, including the five outer space treaties adopted by the United Nations, the principles contained in the five UNGA resolutions and the related resolutions.^{3,4} While these terms are not sufficient, they form a solid basis for further work to define the terms around the key principles and the operational and technical terminology. Precedents may be found in nuclear arms control negotiations and the Non-Proliferation Treaty P-5 talks.

6. It therefore would be useful to come to agreement on definitions of terminology related to outer space behaviours. A list of terminology to support the development of norms, rules and principles of responsible behaviours for definition can be taken from the treaties, principles and related resolutions. The other terms to be defined can be taken from, inter alia, the proposed norms and rules already submitted by Member States, or those terms that other Member States have sought to define in their submissions to the previous OEWG sessions. The work can be carried out by an informal working group, with assistance from outside organisations (such as the United Nations Institute for Disarmament Research, where this topic is under discussion), undertaking the task of proposing definitions for the OEWG. This

² United Nations General Assembly, ‘Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviours’, 30 December 2021, OP3, p. 1, <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N21/417/21/PDF/N2141721.pdf?OpenElement>.

³ Resolutions 1962 (XVIII), 37/92, 41/65, 47/68 and 51/122.

⁴ United Nations Office for Outer Space Affairs, ‘International Space Law: United Nations Instruments’, May 2017, <https://www.un-ilibrary.org/content/books/9789213630921>.

work does not have to impede or otherwise stop the effort to define norms and rules, but rather move in parallel to help support progress.

B. Agreeing to the Underlying Purpose of Norms and Rules

7. The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, adopted on 13 December 1963 (Resolution 1962 (XVIII)), provides a list of legal principles that should undergird any effort towards governance of behaviour in outer space. More fundamental is the basic assertion that in order to continue to derive the benefits of the peaceful uses of outer space, all nations need to agree upon an underlying purpose: to preserve safety, security and sustainability. The separation of efforts towards this goal has hampered the ability of many smaller and emerging players in outer space from engaging successfully in either the efforts to ensure security or to ensure safety and sustainability.

8. While it is not desirable to undermine the mandate of separate organisations with separate tasks, namely the UNGA First Committee and the Conference on Disarmament on the one hand, and the Fourth Committee and the Committee on the Peaceful Uses of Outer Space (COPUOS) on the other, the fact remains that actions that undermine security in outer space also undermine safety and inhibit sustainability. Actions that create debris, for instance, whether intentional or not, undermine safety, security and sustainability for all.

9. Thus, to agree to a set of responsible behaviours in outer space, safety, security and sustainability will all need to be addressed together. Failure to do so risks resulting in gaps in governance on vital matters as issues fall between the mandates of the organisations, or as Member States lack the capacity to address the issue in several bodies simultaneously. Instead, all Member States should be ready and willing to address these issues in a coordinated manner throughout the OEWG process and beyond. Such work will require a sustained process to develop responsible behaviours in outer space and implement the resulting rules and norms, either in a follow-on OEWG or some other formalization of the work.

C. Elaboration of Pre-launch Notification Information Towards a Strengthened Global Registry of Space Objects

10. The 1976 UN Convention on Registration of Objects Launched into Outer Space (UNOOSA) established the requirement to register objects launched into outer space, an outer space National Focal Point, and a related exchange of information to reduce risks and engender cooperation. However, even among its 76 parties, implementation remains uneven. According to UN data, nearly 15% of space objects remain unregistered, and a recent analysis shows that registration rates are declining.⁵ This effort should be universalised and implemented fully by all OEWG participants as a simple and tangible confidence-building measure.

11. In addition, all Member States should register all space objects except for debris, even if the details of some of those objects must remain secret. The responsibility for notification must be clarified in some cases, especially regarding commercial and multi-national launches and de-orbiting plans, and these minimal notification standards should be upheld. All national registrations should be collected on the UNOOSA website and be accessible to all members, and aid should be given to states experiencing systemic problems with compliance, as well as improvements in data transmission and submission certification to provide instantaneous dissemination.

⁵ From “United Nations Register of Objects Launched into Outer Space” at <https://www.unoosa.org/oosa/en/spaceobjectregister/index.html> and Ram S. Jakhu, Bhupendra Jasani, Jonathan C. McDowell, “Critical issues related to registration of space objects and transparency of space activities,” *Acta Astronautica* 143 (2018) 406–420.

D. National Space Operations Centres

12. Those Member States with or seeking outer space capabilities should establish national Space Operations Centres (SOCs) where each of the national Point of Contact (POC) resides, preferably staffed 24/7 to further improve risk reduction by providing real-time connectivity among nations. Such a centre can provide notifications and information related to outer space from other agreements, including an annual plan for Space Launch Vehicles (SLVs) launches and individual Pre-Launch Notifications for SLVs (as required under the Hague Code of Conduct), space object registration information (inter alia, the UN Registration Convention), as well as providing a direct line of communication to the outer space POC (or, more usefully, the tasked 24/7 space operations team).

13. Not all nations will require such arrangements, depending on their outer space capacity and ambition, but there are precedents, including national military operations centres or civilian air traffic control (ATC). SOCs also could become the focal points for a global Space Situational Awareness (SSA) system at a later point, as described in the following section. Thus, each SOC would be connected to a global SSA/SOC to facilitate communications and risk reduction.

E. Development of Space Situational Awareness

14. A broad understanding of what constitutes responsible behaviours in outer space is within reach. However, some Member States are unable to agree upon specifics in defining these behaviours due to a lack of data regarding the types, frequency, location and levels of danger of different activities. This lack of common SSA engenders suspicion that certain commercial actors or the higher capability spacefaring nations may be unfairly taking advantage of their superior SSA to advocate for rules that benefit them but may not be in the interests of the lower capability or emerging spacefaring nations. Indeed, well-designed SSA should aid in the management of both intentional and unintentional hazards and hazardous behaviour, and encourage responsible behaviour by all.

15. Bringing together the smaller amounts of SSA data created by lower-capability and emerging space powers, and establishing data exchange protocols and a means to certify the data, could be an important step towards global SSA. A data centre would be created, alongside methods for monitoring and verifying the integrity of each feed down to the individual quantum of data. Then, once participants are satisfied with the protocols, additional data feeds can be added on a case-by-case basis – such as from universities and research centres – to build more complete SSA. Commercial data also could be added if licensing can be agreed upon. This would then provide each participating state with a better set of SSA upon which it can make judgements about any proposed norms and rules, based on a better understanding of the degree of risk and threat which each addresses.

16. SSA also should include space weather/environmental monitoring, to support sustainability and security, as well as the ability to detect unexpected space activities. It would thus form the basis of Space Traffic Management (STM), if it can be agreed. The STM, similar to the ATC, would collect SSA and space weather together, alongside notifications of short-notice manoeuvres, and information on imminent space launches and other unexpected or potentially hazardous incidents. Fully integrated and supported STM then would contribute both to improve sustainability and security, and therefore benefit all. However, it would not ‘control’ space objects, any more than ATC controls aircraft, but rather, allow real-time avoidance or mitigation of natural or man-made hazards.

17. Precedents abound for development of real-time situational awareness across many other domains, including those involving vital security information; for example, the US-Russia Joint Data Exchange Center (JDEC) and the Comprehensive Nuclear-Test-Ban Treaty Organisation’s (CTBTO) International Monitoring System (IMS). JDEC was an agreement to develop a common situational awareness of missile and space launches signed in 1998. The CTBTO-IMS is a system where monitoring stations around the world (321 across 89 nations) are certified, with the data streams gathered into a central analysis hub for processing and distribution to all signatories in near-real time. The data feeds connected to the IMS are authenticated multiple times a second and are sequestered if potentially adulterated or

compromised. In this way, both governments and private institutions are able to contribute to a global system of situational awareness and to have a very high degree of confidence in the final product.

18. Thus, the development of a common SSA system based on these other real-world examples would facilitate the definition of, and agreement upon, responsible behaviours in outer space. To this end, the first step would be for several of the lower capacity and emerging spacefaring states to work together to develop a common SSA system, including data source certification, data standards, exchange protocols, data validation and other vital elements. In combination with SOCs, a Global Space Operations Centre (GSOC) could be created, modelled on the CTBTO Provisional Technical Secretariat Operations Centre (COPC). Creation of a GSOC would facilitate the open communication of intent, helping with STM, deconfliction, and thus facilitate good behaviours while helping to manage risks around negative behaviours.

III. Norms and Rules

19. As stated above, there are a number of actions previously identified where norms and rules will be required to ensure the sustainable and secure access to the peaceful benefits of outer space. Many submissions to the OEWG have described the various models upon which the norms and rules can be defined. These include the Avoidance of Hazardous Incidents on and Above the High Seas Agreements (INCSEAs) that are implemented by more than a dozen nations in Europe and Asia, the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), and the Code for Unplanned Encounters at Sea (CUES). At the same time, for some of these actions, general rules can be decided as extensions of acceptable and unacceptable behaviour in other domains.

20. Such behaviours include, inter alia:

- (a) Actions that create outer space debris, including direct-ascent weapons, and co-orbital actions such as deliberate collision or other attempts to cause damage or destruction of objects in outer space;
- (b) Actions that take control of, destroy, blind, or damage space objects belonging to other Member States without consent, whether or not they create debris;
- (c) Actions that disrupt or spoof the transmission of civilian positioning, navigation and timing information and other critical space-based infrastructure;
- (d) Actions that destroy, damage, disrupt or spoof military early warning, situational awareness, intelligence, or command-and-control satellites;
- (e) Actions to approach or manoeuvre in the vicinity of space objects belonging to another Member State without warning or in an unsafe manner;
- (f) Actions which cause objects to impact upon or otherwise cause disruptions on or over the territory and territorial waters of a Member State.

21. Some of these already can be addressed unilaterally, as first steps towards universally agreed norms or rules, such as national pledges to voluntarily refrain from destructive, direct-ascent anti-satellite weapons tests, or by being fully transparent in plans regarding the re-entry of outer space objects and their space-launch vehicles and related components. Others will require further awareness-raising of the OEWG-participating states, such as through development of SSA, as detailed in the previous section. Regardless, this work should progress towards the fulfilment of the original mandate in the Resolution 76/231, while the other building-block work is underway. In this way, the processes are mutually supportive, including those underway in other forums, rather than being conducted in parallel.

IV. A Structure Fit for Purpose

22. Finally, Member States should work towards a space-governance system with a structure that is fit for purpose. Several elements can be identified at this stage that will be critical to providing the structure to govern responsible behaviour in outer space. They should

be embedded within the existing outer space governance structure, perhaps as joint bodies under UNOOSA and COPOUS, to ensure coordination among efforts related to outer space security, safety, and sustainability.

(a) *Industry Forum.* Industry often moves more quickly than government in terms of action and, in particular, self-regulation, standards and transparency. Industry is generally more nimble, but its self-determined rules are generally non-binding and flexible. Annual meetings in an industry forum can provide insight into potential scope for future government regulation, as well as visibility in terms of problems or gaps within private-sector governance for governments to take into account. Industry also can be encouraged to work on a code of conduct that can inform the UN OEWG process;

(b) *Governmental Technical Body (Regulatory/Export Control).* It would be necessary for an intergovernmental body to meet and agree upon regulations, standards, certification and export controls of industry. It would limit the possibility of individual companies seeking a ‘lowest-common-denominator’ approach by relocating to a nation with weaker governance to reduce outer space oversight. Examples exist within the Missile Technology Control Regime (TEM/LEEM), among others. This body would, by nature, be less nimble, highly technical and regulatory, tasked with the global coordination of certification, licensing, export controls, taxation, financing, transfers and end-use monitoring. It would contribute to the body of outer space law, as well as developing products such as export control and intangible transfer lists, and registration and pre-launch standards (launch date/time, apogee, orbit, purpose, capabilities and re-entry plan). It also would oversee the eventual development of a global SSA system towards development of real-time STM and the lexicon;

(c) *Government Policy Body.* In addition to the technical body, there should be a policy body that meets, possibly immediately after the technical body, to agree to implement the technical decisions and to discuss higher policy matters. The policy body also could discuss disputes and disagreements and agree upon strengthening or adding to existing norms and rules as needed. This body also would agree upon and maintain the lexicon, with support from the technical body, as well as civil interaction standards and discuss annual space-launch plans, other civil space activities and industry oversight. It would provide a context for the COPUOS and the further encouragement of peaceful cooperation, especially on identifying specific proposals for promulgating the benefits of peaceful uses of and cooperation in outer space;

(d) *Military Plenary Body.* In addition to the technical and government bodies, it would be useful to have a body dedicated to discussion of outer space military issues. This body would be limited in membership to those nations that are, or have ambitions to become, military space powers. This body would discuss additional rules and protocols for regulation of military-to-military interactions in space and propose protocols for military-to-civilian and military-to-industry interactions. The members would discuss military doctrines, plans, launches, capabilities, standards and dispute resolution. Precedents include the Organisation for Security and Co-operation in Europe, where states exchange information on their military force structures, annual budgets, doctrines, exercises and new weapons systems.

V. Next Steps

23. The preceding paragraphs describe simple, practical steps that are either already underway or can be undertaken immediately to support the development of norms, rules and principles to reduce space threats, consistent with the UNGA resolution mandate. They also describe a more ambitious, longer view of how space governance could be structured. This governance system could be politically binding, or part of a legal mandate, such as a UN Security Council resolution. Some countries may prefer legally-binding agreements in this regard. Realignment and reconciliation of existing formats and bodies may be required to fulfil the highest level of ambition, which will be a challenge in itself, but agreement on a theoretical end state should not inhibit practical steps today.

24. Therefore, we recommend the convening of a Group of Eminent Persons (GEP) to address the practical steps and provide further elaboration of a way forward, in parallel with

ongoing work in the OEWG, with an eye towards recommending a mandate for a UN Government Group of Experts (GGE) or a follow-on OEWG. An eventual GGE would take the results of the GEP and the OEWG and provide specific recommendations on practical next steps towards norms, rules and principles, as well as a more ambitious vision for a future governance structure for behaviour in outer space.
