



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

Geneva, 30 January – 3 February 2023

Item 6(c) of the agenda

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****“The Role Space Situational Awareness Can Play in Verifying Future Space Security Agreements”: Submission to the third substantive session (Jan. 30-Feb. 3, 2023) of the United Nations Open-Ended Working Group on Reducing Space Threats through norms, rules and principles of responsible behaviours for Topic 7: Norms, rules and principles relating to international cooperation, including with respect to space surveillance and tracking and space situational awareness****Submitted by the Secure World Foundation¹**

1. As discussions continue at the UN Open-Ended Working Group (OEWG) on reducing space threats through norms, rules and principles of responsible behaviours, it is important to not just identify what responsible behavior looks like, but also the ways in which to objectively monitor and verify it. Space situational awareness (SSA) is knowledge about the space environment and human activities in space formed through technical measurements taken by ground-based radars, telescopes, and (less frequently) satellites in space that allow for the detection and tracking of objects in Earth orbit. SSA capabilities are an important tool for monitoring behaviors and verifying compliance with current and future legally-binding agreements, but more work is needed to refine the concept. Specifically, SSA capabilities are limited in terms of what kinds of threats can be detected, monitored, and attributed, and there are significant challenges still in interpreting the meaning of the technical data.

2. SSA can likely be used to verify certain threats to space systems in orbit, such as destructive anti-satellite (ASAT) tests and uncoordinated close approaches, but is less helpful in verifying threats that are less visible and not as easy to attribute to a specific actor, such as cyberattacks and electronic warfare. SSA in general can help both in identifying patterns of life for normal space activities and when space objects diverge from those normal patterns, as well as verifying that behaviors agreed to as part of legally-binding arms control discussions are being followed. Broadly speaking, SSA is good for verifying something

¹ This submission is based on conversations held at the 2022 AMOS Dialogue in September 2022, co-hosted by the Secure World Foundation and the Maui Economic Development Board (<https://swfound.org/events/2022/2022-amos-dialogue-in-maui>). SWF thanks the participants for their inputs, and acknowledges that any mistakes in this are SWF's alone.



has/hasn't happened in space; determining why that did/not happen is not a job for SSA, but rather for analyses that pull in a wider set of data from different sources.

3. There are different types of arms control agreements, which affects the types of verification and thus the types of SSA information that might be required for each. Multilateral agreements need a verification regime that is accessible to all signatories, who may have different levels of technical capability; whereas by their very nature, bilateral agreements have less parties involved and thus have a different verification footprint.

4. It should be noted that at present, there is no single universally agreed-upon pool of SSA data or catalogue of objects and locations in space. There is the SSA data that the U.S. military collects as part of its mission, some of which is shared globally with other space actors as a matter of public safety. Other countries have their own SSA networks and there are commercial SSA providers as well. While many of these data sets overlap, there are some times when there are discrepancies and much of this data is not shared publicly.

5. An important question to answer is who gets to verify such agreements and whether the verifying parties are biased. Diversifying sources of SSA data can help mitigate the concern of bias somewhat: for example, one of the strengths of the commitment not to conduct destructive direct-ascent ASAT missile tests is that it does not rely solely on U.S. government SSA information to verify the occurrence of such a test - and to attribute it to the originating country. Many countries can observe the resulting debris from the event. So, in a sense, verification of compliance with such a unilateral commitment is self-executing and does not require additional efforts on the part of other States with SSA capabilities already in place.

6. Additionally, verification requires not only taking technical data in but issuing assessments based on that data. That raises the question: who does the assessment? This can be a challenge, as not all states might have the technical expertise to adjudicate the data coming from SSA sensors or even the full picture of activities based on their limited number of sensors.

7. Different states also have different perceptions of what behavior is threatening. For this reason, behavior-based approaches will in many cases be insufficient to establish good intent, or at least the absence of malicious intent. This is because threat perceptions are closely tied to capabilities as well as perceived intent. Another way of looking at it is that capabilities + perceived intent = threat. So there needs to be some sort of assessment of what the intention of the actor in question is, which in turn is shaped not only by knowledge of their technical capabilities but also their budgets, policies, previous activities, and geopolitical interests, among other things.

8. Going forward, we encourage States and civil society to explore these issues further and help develop answers to these questions. Doing so will help create a monitoring and verification regime that can enable future voluntary and legally-binding agreements that help make space safer and more secure for all space actors.
