



Image: Artist's impression

## Report

# **Responsible Behaviours in Space, National Submissions to the UN**

Tuesday 23 – Thursday 25 February 2021 | WP1875V

Tuesday 9 – Thursday 11 March 2021 | WP1876V

Held by Zoom videoconference



## Report

# Responsible Behaviours in Space, National Submissions to the UN

Tuesday 23 – Thursday 25 February 2021 | WP1875V

Tuesday 9 – Thursday 11 March 2021 | WP1876V

## Executive summary

Space systems are integral to national security, development, and daily life. Threats to space systems could deny our use of communications, navigation and banking. Space hazards such as collisions, space debris and space weather can harm space systems. The UN Committee on the Peaceful Use of Outer Space covers these hazards and risks but does not deal with military capabilities and threats.

UNGA Resolution 75/36 encourages states to consider existing and potential threats to space systems and to “characterize actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security”<sup>1</sup>. These conferences discussed how states could share their ideas with the UN Secretary General, as tasked in the resolution.

The UN Charter, international law, the Outer Space Treaty, as well as political commitments between states, form the legal framework in space. We could learn from maritime or airspace agreements to come up with behaviours as a pragmatic way ahead for addressing space threats. There are threats to the ground segment, data links, as well as against satellites. Kinetic and non-kinetic capabilities such as electromagnetic, laser, missiles, or cyber-attacks can be used from Earth-to-space or co-orbitally.

Participants felt that the discussion on managing space threats and agreeing on acceptable behaviours should be held at the UN disarmament structures in Geneva and New York and through the UNGA 1<sup>st</sup> Committee. A Group of Governmental Experts (GGE) and/or an Open-Ended Working Group (OEWG) could further dialogue.

Participants considered how it might feel for them if they lost imagery from satellites or if space systems were to be threatened physically. Common understanding between states is needed to prevent escalation leading to conflict. It is possible to verify and attribute behaviours and good space domain awareness is critical. Early notification, registration, and communication of intentions would help reduce the risk of miscalculation and escalation. Points of contact could support methods of communication.

Responsible behaviours agreed at the UN level are fundamental to building trust. Behaviours can be responsible or irresponsible with positive or negative effects. Behaviours could be categorised into a

<sup>1</sup> United Nations General Assembly (UNGA) First Committee Resolution on Reducing Space Threats through Norms, Rules, and Principles of Responsible Behaviours (A/RES/75/36)

framework of prohibitive, prescriptive, or permissive and it takes incentives and consequences to generate accepted behaviours.

National submissions to the UN Secretary General to be included in the report commissioned under the UNGA resolution should consider input from relevant national stakeholders. Submissions should, where possible,

- *“study existing and potential threats and security risks to space systems, including those arising from actions, activities or systems in outer space or on Earth,*
- *“characterize actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security, and*
- *“share their ideas on the further development and implementation of norms, rules and principles of responsible behaviours and on the reduction of the risks of misunderstanding and miscalculations with respect to outer space”.*<sup>2</sup>

The UK skeleton submission is a useful template for formatting national submissions.

## Introduction

1. The use of space systems is integral to national security, international development and our daily lives. Our reliance on data and services from space means threats to space systems have potentially critical consequences politically, socio-economically and environmentally. States should consider threat capabilities such as lasing, jamming or spoofing which can cripple services and deny use of data. When deployed these capabilities pose a threat, perceived or real. States are also encouraged to consider how agreeing to responsible space behaviours could avoid escalation leading to conflict.
2. On 12 October 2020, the UK proposed a United Nations General Assembly (UNGA) First Committee Resolution on Reducing Space Threats through Norms, Rules, and Principles of Responsible Behaviours (A/RES/75/36). The UNGA adopted the resolution on 7 December 2020 with overwhelming international support.
3. The UNGA Resolution encourages states to consider existing and potential threats to space systems and to *“characterise actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security”*.<sup>3</sup> Responsible behaviours could reduce misunderstandings and miscalculations.
4. In February and March 2021, the UK Foreign Commonwealth and Development Office with Wilton Park hosted two events on following on from the Resolution. The events aimed to increase understanding of the challenges of managing threats to space systems and to provide the opportunity for states to suggest behaviours. The intended outcome was for states to be better prepared to draft national submissions to the UN Secretary General on responsible behaviours in space. 50 participants from 27 states attended the events.

## The importance of space

5. Use of space is integrated into our lives, but we often do not realise we are using space-enabled services and take for granted their benefits. A presentation was given describing the importance of space for development, everyday life, and security. Examples in development include agriculture, food security, global health and disaster management. Communication, imagery and data for providing basic services in cities, and banking are examples of how space supports everyday life. Positioning, navigation, timing (PNT) as well as synchronisation and early warning support defence and security operations as well as autonomous vehicles. Most participants agreed that overall Earth Observation, communication, PNT and the internet were the key space-enabled services.

<sup>2</sup> Ibid

<sup>3</sup> Ibid

## Understanding space systems

6. Space systems comprise three segments: satellites; the data that commands and controls the systems and content data provided as a service; and ground infrastructure. Various users benefit from the outputs of space systems. All aspects of space systems are vulnerable to malicious action. Cyberattacks present a threat to space systems and services. Threats can be intentional or unintentional through lack of operator knowledge or experience, or deployment of a military capability. Participants suggested that capacity building and international cooperation could help mitigate unintentional threats and agreeing acceptable behaviours could help mitigate the perception of an innocent action as an intentional threat.

## Hazards and Risks Associated with Operating in Space and How They Are Addressed: The Role of the UN Committee on the Peaceful Use of Outer Space in Vienna

7. A presentation was given highlighting space hazards which can cause harm to space systems, such as collisions, space debris (including from threats such as anti-satellite missile (ASAT) testing), space weather and end of life procedures for satellites. These hazards are discussed at the international level through the UN Committee on the Peaceful Use of Outer Space (COPUOS). However, COPUOS does not deal with military capabilities. Participants highlighted transparency, communication and shared space situational awareness (SSA) as important in mitigating hazards and risks. It was mentioned that commercial rendezvous and proximity operations (RPOs) including on-orbit servicing (OOS) conducted without consent could be perceived as threatening.

## A review of the legal framework

8. A presentation was given on the Outer Space Treaty and other instruments such as the UN Charter and International Humanitarian Law which apply to space. Consideration was given to differentiate legally binding instruments from political commitments and parallels were made to legal frameworks in the maritime and cyber domains. Some participants felt space should be recognised as a 'zone of peace' and advocated the non-weaponization of space be made legally binding. It was proposed that the challenge is finding how to prevent states from exploiting any 'grey zone' in the space legal framework. It was agreed that the UNGA Resolution on Reducing Space Threats has opened a door to dialogue building on existing applicable legal frameworks and as such is a pragmatic way ahead for addressing threats.

## What are the Assessed Security Threats to Operating in Space?

9. An assessment of the threats to space systems was given in a presentation drawing on the Secure World Foundation 2020 Counterspace Report<sup>4</sup> and Center for Strategic and International Studies reports<sup>5</sup>. Space has been militarised since the beginning of the space age and has recently been weaponised. Comparisons were made across states' kinetic and non-kinetic capabilities such as electromagnetic, laser, missiles or cyber-attacks which can happen from Earth-to-space or co-orbitally. Recognising the large generation of debris from kinetic weapons which is self-detering, states are focusing on soft kill capabilities. Participants suggested that it is important to create norms for the non-use of kinetic capabilities, such as ASATs, and raise the threshold for soft kill capabilities. These threats can also impact the ground segment and data links, as well as satellites. It was argued that threats such as jamming, spoofing, or non-consensual take-over of a satellite need to be addressed as the activity can be hard to detect.

<sup>4</sup> Secure World Foundation, Global Counterspace Capabilities: An Open Source Assessment (2020) <https://swfound.org/counterspace/>

<sup>5</sup> Center for Strategic and International Studies, Space Threats Assessment (2020) <https://www.csis.org/analysis/space-threat-assessment-2020>; Center for Strategic and International Studies, Defense Against the Dark Arts in Space: Protecting Space Systems from Counterspace Weapons (2021) <https://www.csis.org/analysis/defense-against-dark-arts-space-protecting-space-systems-counterspace-weapons>

## What are the perceived potential impacts of space threats?

10. Established and emerging space nations were asked to consider how it might feel for their space-based capabilities to be threatened. A number of questions were raised:

- How would they feel if their satellite were held at physical risk?
- How would they feel losing satellite imagery capabilities?
- How would blinding a satellite affect trust between states?
- If a nation launches an ASAT would this be considered a test or a threat?

These questions made participants consider how they perceive threats. For technical reasons, the speed of an event in space is usually faster than the recognition and reaction time; a nation may not initially feel threatened and may not know their satellite or service is under threat until it is too late. Participants discussed that many of these issues are missing from arms control discussions and require consideration. Participants suggested we need common understanding through transparency, signalling and communication to prevent escalation leading to conflict. It was argued that behaviours agreed at the UN level are fundamental to building trust.

## Geneva and New York: The Role of UN Disarmament Structures to Manage Threats in Space

11. Space disarmament-related work is difficult because there is no definition or consensus on what constitutes a 'space weapon'. Examples of UN level frameworks that participants felt are worth looking at were presented including the Conference on Disarmament (CD) and the Comprehensive Test Ban Treaty (CTBT). Parallels were drawn with cyber as similar challenges exist in space around scope of application, general obligations, definitions, verification as well as transparency and confidence-building measures (TCBMs). Many participants suggested the CD is not the right place to discuss space threats as it has been hard to reach agreement there due to process obstructionism by certain states. Many participants suggested the use of a Group of Governmental Experts (GGE) and/or an Open-Ended Working Group (OEWG) to further dialogue. It was observed that the CTBT process did not happen overnight and the UNGA Resolution is a pragmatic way forward to build consensus on managing threats in space through agreeing acceptable behaviours.

## The challenges of managing threats to space systems

12. Two breakout groups conducted a scenario-based exercise on 1) verification and attribution, and 2) TCBMs. The example used was a UK satellite using a harpoon and net for debris capture which was perceived as a potential threat.

- **On verification and attribution** participants found communication paramount, potentially enabled by pre-launch notification, registration and information on intentions. As there is no space activity coordination mechanism or body, more information about activity and intent should be given. Greater SSA through wider/shared access to data was considered helpful. A system of identified and available points of contact would aid communication.
- **On TCBMs** participants also considered communication, particularly of intentions, paramount. One participant reminded the group of the UNGA resolution Operative Paragraph 3 to "... *consider establishing channels of direct communication for the management of perceptions of threat*".<sup>6</sup> States judge others in part on their previous behaviour when interpreting current activity. Timely satellite registration starts the process of building trust. Proximity is important regardless of capabilities, implying behaviours for proximity operations could be usefully agreed.

<sup>6</sup> United Nations General Assembly (UNGA) First Committee Resolution on Reducing Space Threats through Norms, Rules, and Principles of Responsible Behaviours (A/RES/75/36)



## Considering Potentially Helpful Areas of Behaviour

13. A presentation was given on how behaviours can be responsible or irresponsible with positive or negative effects. Due regard and non-interference were given as examples of important responsible behaviours. Additionally, there are behaviours in the maritime domain such as those set out in the Prevention of Incidents On and Over the High Seas (INCSEA) which could prove useful in space. Behaviours could be categorised into a framework of prohibitive, prescriptive, or permissive as well as via a black, grey or white list. Consideration should be given to the utility of such lists. Framing behaviours in these ways could help to agree on a list. Participants agreed that categorising behaviours would prove helpful in building the framework of behaviours for mitigating threats and it was argued it takes both incentives and consequences to generate accepted behaviours.

## Threats and Behaviours in the Context of National Submissions

14. A UK skeleton outline of the submission to the UN Secretary-General was distributed as an example of a structure for national submissions (this report broadly follows the framework of the UK submission). It is important for national submissions to consider the threats to space systems, how perceived threats make them feel, what behaviours they see as responsible or irresponsible and ideas on ways forward after the UN report.

## National Perspectives on Areas Where Behaviours May Be Helpful to Mitigate Threats

15. Two breakout groups considered mitigating threats through behaviours.

- **On the political advantage of agreed behaviours**, it was reiterated that transparency, pre-notification and communication are paramount. It is important to take both a broad and specific approach, for example considering broad behaviours such as interference as well as specifics such as ASAT testing. There should be a list of behaviours, but some activity remains challenging to categorise such as jamming and spoofing.
- **On behaviours, verification, and activity**, some participants reiterated that pre-notification is key to avoiding misinterpretation of activity. Other participants noted that activity such as lasing can be standard practice or destructive depending on how it is undertaken. There should be regular dialogue between states and continued use of SSA capabilities to monitor and assess. As a basic premise and drawing from the maritime domain, safety and precaution in activities are helpful behaviours.

## Perspectives on How to Structure National Submissions to the UN Secretary General

16. When discussing structuring national submissions some participants referred to Operative Paragraph 5 and said that submissions should answer the question that was set in it.

*“Encourages Member States to study existing and potential threats and security risks to space systems, including those arising from actions, activities or systems in outer space or on Earth, characterize actions and activities that could be considered responsible, irresponsible or threatening and their potential impact on international security, and share their ideas on the further development and implementation of norms, rules and principles of responsible behaviours and on the reduction of the risks of misunderstanding and miscalculations with respect to outer space”.*<sup>7</sup>

17. Some participants said that the UK skeleton template was useful. Participants suggested it is important to get input from relevant stakeholders at the national level such as various governmental departments, non-state actors, space agencies, academia and the military. When framing national submissions, it was suggested to consider overarching principles of the centrality of space to our lives, how space systems work and then look at detailed substance such as intentions, impact, perceptions, threats, activities and behaviours. National submissions will be unique and there are no wrong answers; all inputs will add energy to move the process forward.

<sup>7</sup> Ibid

## The UN Process after the UN Secretary-Generals' Reports

18. It was agreed that the UNGA Resolution and these conferences have started a dialogue on how to move the process forward to agree responsible behaviours. After States send their national submissions to the UN (by 3 May), the UN Office on Disarmament Affairs will run three workshops and then draft the report on behalf of the UN Secretary-General. The intention is for the report to be published in August. As the issues surrounding threats are state-to-state in nature with the potential to escalate to conflict, the UN 1st Committee was considered the appropriate forum for further discussion to set out future negotiations and discussions. Many participants would like to see a G GE and/or OEWG to consider a framework of behaviours for addressing the issues raised on space threats. Rapid advances in counter-space capabilities demand urgency and it was suggested that working internationally outside as well as within the UN might expedite matters. Participants hoped to find 'quick wins' within the next 2-3 years while working more challenging issues longer-term.

### J. Lauren Napier

Wilton Park | March 2021

Wilton Park reports are intended to be brief summaries of the main points and conclusions of an event. Reports reflect rapporteurs' accounts of the proceedings and do not necessarily reflect the views of the rapporteur. Wilton Park reports and any recommendations contained therein are for participants and are not a statement of policy for Wilton Park, the Foreign, Commonwealth and Development Office (FCDO) or Her Majesty's Government.

Should you wish to read other Wilton Park reports, or participate in upcoming Wilton Park events, please consult our website [www.wiltonpark.org.uk](http://www.wiltonpark.org.uk). To receive our monthly bulletin and latest updates, please subscribe to <https://www.wiltonpark.org.uk/newsletter/>