UK WORKING PAPER FOR THE UN OPEN ENDED WORKING GROUP ON REDUCING SPACE THREATS THROUGH NORMS, RULES AND PRINCIPLES OF RESPONSIBLE BEHAVIOURS

This paper sets out the UK's vision for what we hope the OEWG will achieve. We set out UK views on the context and role of the OEWG; describe the current threats arising from States' behaviours with respect to outer space; take stock of the existing legal and normative frameworks; and offer reflections on how the discussions of the OEWG on 'norms, rules and principle of responsible behaviours' can contribute to strengthening space security by promoting transparency, trust, and predictability.

The strategic context for the OEWG

Space is a crucial part of regional and global stability

1. We all rely on space systems for security, international development and global prosperity. Space systems include satellites; ground infrastructure; the data links between them (content, and command and control); and the user equipment. The space system provides the end user with data, information or a capability such as global communications or the ability to monitor missile launches. It is vital that all nations can operate these systems safely and securely.
2. We see space security as intrinsically linked to security in other domains. The UK therefore envisages that this working group will draw the links between space threats and how they impact our overall views of national, regional and global security. By taking a holistic approach to threats against space systems and developing a framework of responsible space behaviours, we can manage threats, prevent miscalculation and avoid escalation leading to conflict.

Maintaining a clear distinction between space security and space sustainability

3. Space security is concerned with the threats from one nation to another from the conscious choice of a State to behave in a way that could result in harm to space systems. Such behaviours are threats to international peace and security and are dealt with by the UNGA First Committee and the Conference on Disarmament with the desire to prevent an arms race in outer space, one of its strands of activity.
4. Space sustainability, on the other hand, is delivered primarily through the UNGA Fourth Committee and the UN Committee on the Peaceful Uses of Outer Space. That work aims to ensure safe and sustainable space operations and to protect the space environment from natural hazards.
5. As we meet for the first time to discuss these threats in this OEWG we are pleased that the working group on the Long Term Sustainability of Outer Space Activities (the LTS) has concluded its work plan in Vienna and we look forward to engaging there on work to keep the space environment safe, secure and sustainable. We should not conflate the national security matters we are dealing with here with space environment matters in Vienna although coherence is required across the two tracks.

Threats to space systems and their effects

6. The term "Threat(s)" can convey different meanings depending on its context. In the ordinary meaning of the term "threat" is defined as "(noun) (1) a declaration of the intention to inflict harm, pain or misery, (2) an indication of imminent harm, danger or pain, (3) a person or thing that is regarded as dangerous or likely to inflict pain or misery" (Collins British English dictionary). In addition, it has a particular significance in international law on the use of force.

7. The UN Charter Article 2(4) states that "all Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations". The Outer Space Treaty is clear that the UN Charter applies in Outer Space and so this prohibition applies to the actions of States in outer space.

8. The use of the term "threat" in the work of the OEWG should focus on the harmful effects that can result from the behaviours of States[1] in terms of how they deploy or use capabilities that can inflict damage to, or interfere with, the space systems of another State.

9. The development, deployment or use of counter-space capabilities, for example anti-satellite missiles to destroy satellites, lasers to prevent Earth observation, jamming to stop navigation and other Earth-based and in-orbit weapons, may threaten space security and, in turn national, regional and global security. In some cases, a perceived threat may not in fact be an intended threat but misinterpreted as one.

10. The risk of misperception is particularly pronounced where the capability or use of a system is not known to a third party. We may wish to consider questions around how to convey peaceful intentions when testing a system and what effects of the test would make a system sufficiently concerning to need to be on a notification list. The internal components of a satellite cannot be checked once in orbit and this inability to determine capability once placed in space poses unique and difficult issues for verification. A State which is being impacted may, as a result, face doubts over the nature of activity in space (e.g. a satellite performing Earth observation or intelligence, surveillance and reconnaissance). In short, while space systems can be observed, their capabilities and the intent of their operators is opaque.

11. In an era of intensified competition between States outside of conflict, destabilising effects may result from behaviours that threaten, or create the perception of a threat against space systems. Given the importance and sensitivity of these space systems, the perception of threats to them is far from consequence-free. In such circumstances, the absence of clear and internationally-understood standards of responsible space behaviours could lead to misunderstandings and miscalculations and to conflict. As the British Chief of the Defence Staff said on 30 March 2021, "escalation management is a big challenge. It is becoming a bigger challenge because there is this risk of inadvertent escalation and, therefore miscalculation, and it is greater now than it was a few years ago".

Counter-space systems

12. Irrespective of discussions in the UN aimed at preventing an arms race in outer space, a number of States already possess a broad range of both kinetic and non-kinetic counter-space capabilities that can damage, degrade or destroy any of the four segments of space systems. This creates security concerns for States that rely on those systems, thereby driving development of further systems to protect and defend those space systems.

13. Some capabilities were tested in the Cold War and some are more recent deployments. Some of these counter-space capabilities are already placed in space, but many of them are not space-based but on Earth. We must take all of these and the way they are used into account if we are to prevent dangerous miscalculation and/or the creation of a threat to international peace and security.

14. More detail on these kinetic and non-kinetic capabilities can be found in the United Kingdom National Submission on Space Threats to respond to the call from UN Secretary General under

[1] Or entities acting on the instructions of or under the direction or control of a State. State licensed assets or capabilities conducting irresponsible behaviours should be controlled by the licencing State.

the UN GA Resolution A/RES/75/36 on “Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours”.

International Law

15. International law applies to the conduct of States in, and in relation to, outer space. This is clear from Article III of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the Outer Space Treaty),[2] which provides that States Parties shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding.

16. Article 2(4) of the UN Charter prohibits the threat or use of force and Article 51 preserves States’ inherent right of individual or collective self-defence. In addition to the UN Charter, the international legal framework includes customary international law as well as other treaties. The law of armed conflict will apply to operations in space conducted in the furtherance of hostilities in armed conflict.

17. As regards treaties specifically relating to outer space, the Outer Space Treaty sets out core principles for operating in outer space including the prohibition on the placement in orbit around the Earth of any objects carrying nuclear weapons or any other kinds of weapons of mass destruction (as set out in Article IV). It also sets out principles of co-operation and mutual assistance and requires States Parties to conduct their activities in outer space with due regard to the corresponding interests of all other States Parties (Article IX).

18. Other key treaties relating specifically to outer space include the Convention on International Liability for Damage caused by Space Objects,[3] and the Convention on Registration of Objects launched into Outer Space

Work on preventing an arms race in outer space

19. The final outcome document of the 1978 First Special Session of the UN General Assembly devoted to disarmament (‘SSOD-I’), which established the Prevention of an Arms Race in Outer Space (PAROS) on the agenda of the overall disarmament machinery, does not mandate any particular outcome: “In order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Outer Space Treaty”.

20. It is not useful only to focus only on certain types of weapons in isolation while many different ones exist, including non-kinetic weapons that can deliver strategic effects. Equally, there is a need to consider the wide range of elements that could be considered as “further measures”, ranging from TCBMs to the sharing of doctrine to norms, rules and principles and to Politically- and legally-binding instruments.

New proposals

21. UNGA Resolution 75/36 in 2020 mandated a report by the UN Secretary General. The 2021 resolution, which was adopted in the UNGA First Committee with a larger margin than the previous year, sets up an Open-Ended Working Group (OEWG) to consider the resolution’s focus of “Reducing space threats through norms, rules and principles of responsible behaviours”. The responsible space behaviours approach is appropriate under PAROS as a “further measure” and the OEWG is “an international negotiation”. All behaviours in armed

[2] Adopted by the UN General Assembly in its resolution 2222 (XXI) and which entered into force on 10 October 1967.
[3] Adopted by the UN General Assembly under resolution 2777 (XXVI) which entered into force on 1 September 1972.

conflict should be governed by the Law of Armed Conflict. But outside of conflict the approach of "responsible behaviours" should reduce miscalculation and escalation.

Previous proposals

22. We consider the scope of one draft treaty proposal (known as the PPWT) to be too narrow and understand that it seeks only to prevent States from placing weapons such as ballistic missile interceptors in space or destroying satellites with anti-satellite missiles from Earth. We should not focus only on certain types of weapons in isolation while many different ones exist, including non-kinetic weapons that can deliver strategic effects.

23. Any treaty focused on "weapons in space" would need to decide upon a definition of a space weapon and include the whole suite of counterspace systems. The definition is not straightforward as many systems that have a civilian purpose can also be used for military purposes and there are further gaps in the PPWT such as on the use of lasers. Most threats to space systems come from the Earth such as electronic interference, lasers and cyber- attacks and usually do not destroy the target, rather rendering it inoperable or unusable. Also, verification is no simple matter because once a satellite is in space, it is almost impossible to verify its capabilities.

24. The annual resolution at UN First Committee entitled "No first placement of weapons in outer space" fails to define what a weapon is for the purposes of this resolution. Without a common understanding of what we mean by a space weapon, this resolution would increase the risk of mistrust or misunderstanding with regard to the activities and intentions of States. The UK considers that at least one State already has weapons in space (even using the narrow definition of a weapon as something that can deliver kinetic effect – a definition the UK believes to be too narrow), undercutting the initiative's stated aim.

Trust and common understanding

25. As we see in RES/76/22, there is a call for further measures to build on the legal regime and build trust. Trust increases co-operation between States and reduces the likelihood of miscalculation. The resolution:

> *Emphasizes* the necessity of further measures with appropriate and effective provisions for verification to prevent an arms race in outer space.

26. Certain counter-space capabilities when deployed can make a State feel vulnerable or threatened and we refer to this as perception of threat, which can lead to misperceptions and miscalculation. The existence of these capabilities in the absence of accepted or agreed responsible behaviours around their use raises the risk to all. In order to manage or to mitigate perceptions of threat, a common understanding needs to be established between States, to include the actor State and the State being impacted. In particular, a State which is being impacted needs to:

    a. Understand the intent or message being sent through development, deployment or use of a capability by another state (whether or not the impacted State agrees with the content of that message);

    b. Generate, with the perceived threatening State, a shared view of how irresponsible behaviours could feed in to escalation calculations; and

    c. Understand whether there are differences between the two State actors over what is considered generally safe and responsible State practice.

The role of Responsible/Irresponsible behaviours

27. Behaviours are the actions, activities or omissions of States, which either prevent/manage/limit (in the case of responsible behaviours) or can create (in the case of irresponsible behaviours)

threats – or potential threats – to space systems. These behaviours can either improve international security amongst States by reducing the risk of miscalculation and the likelihood of escalation, or destabilise international security or create a risk of miscalculation. Categorising something as irresponsible may allow discussion of the acts of a State which may not be unlawful, but which may be perceived as a threat by another State.

> Country A has displayed responsible behaviours by conducting rendezvous operations in an open and transparent manner. This has reduced the risk of misunderstanding or miscalculation on the part of Country B

28. Destabilising effects may result from behaviours that threaten, or create the perception of a threat against space systems. It is these effects, and other similar ones, that should be considered when trying to prevent an arms race in outer space.

29. The UK considers that the OEWG should propose behaviours that are responsible and irresponsible. The OEWG may also decide that certain effects of counterspace weapons should be restricted; could investigate actions that harm civilians; and might suggest activities which should be better understood between parties and in some cases communicated in advance. The detail of each of these could be discussed and proposals made for further work on norms, rules and principles. There may also be a call for more openness of capabilities, or at least an increase in global knowledge of the issues.

Other relevant frameworks and Bodies

30. Frameworks exist in other domains that we could study and possibly learn from to draw up what we consider to be responsible behaviours. These include the global Convention on the International Regulations for Preventing Collisions at Sea, 1972 and the Asian regional Guidelines for Air Military Encounters adopted at the 2018 ASEAN Defence Ministers Meeting. However, there are not straight parallels to be drawn as, for example, the Convention on International Regulations for Preventing Collisions at Sea is a binding Treaty, and it is not security-specific – i.e. it sets out the "rules of the road" for operating at sea.

31. There are Confidence Building Measures such as Code for Unplanned Encounters at Sea as well as formal mechanisms such as the Wassenaar Agreement, the Missile Technology Control Regime, and the Hague Code of Conduct.

32. Certain space issues are dealt with through bodies such as the International Telecommunications Union which regulates the use of spectrum as well as slots in Geostationary Orbit.

Final Report and Behaviours

33. The United Kingdom suggests that the final report of the OEWG should include sections on each of the elements of the mandate.

    a. To take stock of the existing international legal and other normative frameworks concerning threats arising from State behaviours with respect to outer space;

    b. To consider current and future threats by States to space systems, and actions, activities and omissions that could be considered irresponsible;

    c. 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;

34. In its submission on Space Threats in response to the call from UN Secretary General under the UNGA Resolution A/RES/75/36 on "Reducing Space Threats through norms, rules and principles of Responsible Behaviour" 30 April 2021 in which we set out seven types of activity that would benefit from further, expert-level discussion. These examples – covered in the submission in greater depth – include suggestions that States might reach the following shared understandings:
    a. ASAT missile testing is unacceptable or unacceptable whenever a strike leads to the creation of debris.
    b. It is unacceptable to place a co-orbital weapon or an electronic warfare satellite next to the national security satellite of another nation.
    c. Blinding a satellite with loss of sight could be considered threatening and revealing of a State's intent to hide activity, including preparations for conflict.
    d. States should not conduct or knowingly support activity, for example the jamming or spoofing of PNT signals, which intentionally harms the systems of civilian operators such as emergency responders or normal aircraft operations.
    e. It is unacceptable to take over manoeuvring control of an active satellite without the consent of its owner.
    f. States should consider how best to cooperate to exchange information, set up contact lists for emergencies, assist each other, and implement other cooperative measures to address threats to space systems.
    g. Rendezvous operations should be conducted in an open and transparent manner, include pre-manoeuvre communications and follow an understood and shared set of procedures.
35. The output could be that "for Behaviour X [or action or activity Y] we need greater transparency and a mechanism to understand intent and manage escalation". We should ask if something that could be considered a safe operation at times of low tension, might be an irresponsible act at times of heightened tension, and therefore how to define that as a behaviour.
36. Responsible or irresponsible behaviours (activities, actions and omissions) could be defined as following or not following an understood pattern of action. We have identified areas where responsible space behaviours would help manage the misunderstanding or miscalculation of some novel activities or new technologies and should consider a range of supporting solutions:
    a. TCBMs – see below;
    b. Political commitments or non-legally-binding measures: learn from other domains. A number of norms, guidelines, and bodies aimed at establishing or clarifying standards of behaviour, increasing transparency and creating mutual confidence between States all exist in the land, maritime and air domains and we could examine and learn from these to see if similar ones could be devised for space. One example would be the norms of responsible state behaviour in cyberspace;
    c. Consultations – ways to improve information sharing between States on the deployment and use of counterspace systems and on any effects being felt by a State.
    d. Discussion of capabilities, actions or omissions that warrant further investigation because of the ability to threaten space systems. These may be a question of context, severity of effect and intent;
    e. Legal Agreements. Instruments where the use of a technology could be regulated or constrained such as one that prohibits the kinetic testing of direct ascent anti-satellite missiles or co-orbital weapons where long-lived debris is created. Any legal agreement must be comprehensive, verifiable, contain definitions and be implementable.

Transparency and Confidence-Building Measures, TCBMs

37. From the 2013 report by the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (para 34), we can say that a proposed transparency and confidence-building measure should:

    a. Be clear, practical and proven, meaning that both the application and the efficacy of the proposed measure have been demonstrated by one or more actors;

    b. Be able to be effectively confirmed by other parties in its application, either independently or collectively;

    c. Reduce or even eliminate the causes of mistrust, misunderstanding and miscalculation with regard to the activities and intentions of States.

The following table offers a framework for testing a transparency and confidence-building measure:

	Implementation	*Demonstration*
Who	Who should implement the measure?	Who will be able to confirm that the measure has been implemented?
What	What is the measure that should be implemented? Is it clearly identified and understood?	What should be demonstrated to confirm implementation?
Why	What is the value or benefit of performing the measure?	Does a clear understanding of why it is important to be able to confirm or demonstrate implementation exist?
When	When should the measure be implemented?	At what point is demonstration or confirmation performed?
How	How should the measure be implemented?	How is implementation of the measure validated,