

AN UPDATE ON “OUTER SPACE SECURITY”

and

A BRIEF HISTORY OF THE PREVENTION OF AN ARMS RACE IN OUTER SPACE

Presentations to inform CD Subsidiary Body 3 discussion ¹

23 May 2018, 15h00, Council Chamber, Palais des Nations

Introduction

The Prevention of an Arms Race in Outer Space (PAROS) is a long-standing issue before the Conference on Disarmament (CD), dating back to the early 1980's. Whilst it has commanded significant attention from many Member States over the years, it has been difficult to reach widespread understanding on even basic foundational concepts. Many have lamented the slow rate of progress on this agenda item in years past. The formation of this Subsidiary Body, pursuant to the CD's decision of 16 February 2018, ² provides a new opportunity for Member States to explore possible pathways towards enhancing space security and ensuring the long-term sustainability of space activities.

At the request of Brazil, the Special Coordinator for Subsidiary Body 3, UNIDIR has been asked to make two brief presentations. The first will be an update on space security, as a means of updating delegates on some technical concepts and terms related to PAROS. The first presentation will last approximately twenty-minutes. The second presentation will be on the history of PAROS in the CD, outlining the origins of this agenda item, how it has evolved over time and what the current initiatives are surrounding this issue. That presentation will last approximately twenty-minutes. These briefings have been put together with a view to informing your discussion on the PAROS item, and UNIDIR remains at this Body's disposal for any further substantive insights.

Let me make a few quick points, regarding my presentations:

First, they are not exhaustive in scope by any means. Whilst I have sought to capture the most notable developments related to outer space security and PAROS, these are by no means comprehensive studies of a very large and complex subject.

Secondly, there are many written materials which may be consulted for further information. UNIDIR has published several briefs on PAROS and space security, such as UNIDIR's "The CD: Issues and Insights" published in 2012, as well as "The CD and PAROS: A Short History", drafted in 2011 by the former Canadian Ambassador to the CD, Mr Paul Meyer. I would also recommend the UNIDIR Space Dossier series, of which

¹ This paper was prepared by Mr Daniel Porras, Space Security Fellow, UNIDIR. A special thanks goes to Amb (ret.) Paul Meyer for his input as peer reviewer.

² CD/2119, 19 February 2018.

File 1 is on “Strategic Stability and Space Security”, and File 2, on possible “anti-satellite” test guidelines. All of these documents will be uploaded to the CD website and may be found on our website, www.unidir.org. You will also find the reports of the annual Space Security Conference, which contains in-depth discussions on many of the issues that I will touch upon today.

PART I - AN UPDATE ON “OUTER SPACE SECURITY”

What is “outer space”?

As many of you may already know, there is no legal definition or delimitation of outer space. In fact, there is an agenda item on the definition and delimitation of outer space that is discussed every year at the UN Committee on the Peaceful Uses of Outer Space, but no decision has been reached.³ Some have utilised an altitude of 100km as the delimitation of outer space, such as in the 1998 Australian Space Activities Act or the pending 2018 California tax exemption for space transportation companies. Neither of these, though, are dispositive at the international level.

From a physical perspective, it can be said that outer space gradually begins somewhere between 18 km (the limit of most aviation activities) and 160 km (the current lowest limit of outer space activities). After this altitude, outer space stretches on into the cosmos.

Where in space do “human space activities” take place?

While there is no definition of outer space, we can identify the areas where space activities take place. The main place is, of course, in Earth’s orbits, where nearly every object ever launched operates. According to a database maintained by the Union of Concerned Scientists, as of last September, there were 1,738 satellites in Earth’s orbits.⁴ This number is set to jump dramatically in the coming years thanks to technology miniaturisation and cheaper launch prices.

The first of the major orbits is the Low Earth Orbit, or LEO. This is the most diverse orbital ecosystem, with objects ranging from tiny telecommunication satellites to the International Space Station. At present, there are roughly 1,071 satellites in LEO. The Inter-Agency Space Debris Coordination Committee (IADC) defines LEO as anything below 2000km. This means that, for our discussion, LEO activities generally take place somewhere between 160-2000km. It should be noted that intercontinental ballistic missiles also fly within this orbit, sometimes reaching altitudes of nearly 1,200 km in mid-course flight.

The second major orbit is the medium Earth orbit. This band is located at roughly 20,000km. It is particularly useful because objects at this altitude pass over the Earth twice a day. At present, it features some navigation satellites and numerous military prototypes. There are only 97 satellites currently in this orbit.

³ See “Definition and delimitation of outer space: views of States members and permanent observers of the Committee”, 57th Session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, 26 February 2018 (A/AC.105/1112/Add.4)

⁴ See Union of Concerned Scientists: Satellite Database. Available at: <https://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database#.WwLOXUjFPIU>

The third and highest orbit is the geo-synchronous orbit, or GEO. Positioned at altitudes of roughly 36,000km, satellites can move at the same rotation of the Earth. This orbit is especially useful for major telecommunication satellites. Here, there are roughly 531 very large, very expensive satellites.

What are “human space activities”?

Many of you will already be aware of the rapid advances in space technology over the last fifty years. Applications such as telecommunications, geo-location and Earth imaging are not new, and they have become integral to daily life.

Some of you will also be aware that new technologies and innovative thinking are leading to a new generation of space applications. These include activities like in-space manufacturing, the deployment of mega-constellations for worldwide satellite broadband, and deep space habitation. Efforts to turn these ideas into reality have moved far beyond the planning stage, with some in trial periods as we speak.

Perhaps the most tangible way to quantify the increase of human space activities is through valuation. A recent study by Bank of America Merrill Lynch valued the current space market at roughly \$350b, with some estimates that this value will reach \$2.7t by 2040. This does not, of course, take into account the incalculable value of things such as increased connectivity for families, heightened environmental awareness and the inspiration that is derived from human space exploration, but it does give us a good visual of the growth of space activities.

What are “military activities” in outer space?

One area where outer space has become critically important is in military activities. Nearly every military around the world uses satellites for telecommunications and imagery. Some major military powers employ space capabilities to coordinate complex global operations, monitor troop movements and target tactical strikes. This is often referred to as the “militarisation” of outer space, which implies using space capabilities to facilitate operations on Earth. Such activities arguably began as soon as human space activities commenced. Today, one notable trend we are seeing is the blending of commercial and military activities, as more and more commercial operators are contracted by the military sector.

What are “counterspace” capabilities?

As the central role of space capabilities for the military grows, there have also been significant developments in the area of counterspace technology. This includes any type of technology that can be used to deny access to the space capabilities of a rival or adversary. Earlier this year, the Secure World Foundation, a private US think tank, released a global counterspace capabilities assessment, compiling and assessing publicly available open source information across five categories:

- **Direct Ascent:** weapons that use ground, air-, or sea-launched missiles with interceptors that are used to kinetically destroy satellites through force of impact, but are not placed into orbit themselves
- **Co-orbital:** weapons that are placed into orbit and then manoeuvre to approach the target
- **Directed Energy:** weapons that use focused energy, such as laser, particle, or microwave beams to interfere or destroy space systems
- **Electronic Warfare:** weapons that use radiofrequency energy to interfere with or jam the communications to or from satellites

- **Cyber:** weapons that use software and network techniques to compromise, control, interfere, or destroy computer systems.⁵

As this report points out, much of this technology is not new, but the context in which they exist is changing. There are increased incentives to use counterspace capabilities, as well as wider access to the requisite technology. Counterspace capabilities, particularly kinetic ones, not only threaten military operations, but potentially every aspect of daily life that is touched by space capabilities. In particular, kinetic anti-satellite weapons, namely those that use physical force to destroy a space object, leave behind significant amounts of space debris which then pose a threat to all actors in space.

What are the threats to space activities?

This brings us to the next important question, namely what are the threats to space activities. Many discussions on this issue often refer to “growing threats to safety, security and sustainability” in outer space. Professor Kazuto Suzuki of Hokkaido University defined these terms as follows: safety is freedom from unintended threats, security is freedom from intended threats, and sustainability is the ability to keep doing what you’re doing.⁶ Thus, I often think of “threats in outer space” in terms of these categories.

The “safety” threat that receives the most attention is space debris. Space debris is the trash and refuse that has been left behind from human space activities. The speeds at which debris travels in LEO means that a collision with even a small piece of debris could be devastating for a space object. Each collision creates more debris that poses its own threat to other space objects, possibly triggering a cascade effect that could lead to catastrophic collisions with more and more space objects.⁷ Depending on the altitude of the debris, some of it can remain in orbit for decades, known as “long-lived debris”. The US Space Surveillance Network today tracks over 23,000 objects larger than 10cm in orbit and estimates that there are over 500,000 objects larger than 1cm. A recent example of a major debris-generating incident occurred in 2009 when the defunct Russian satellite Cosmos 2251 collided with the US Iridium 33, leaving behind nearly 2,000 pieces of debris larger than 10cm. Each of the remaining pieces represents a new threat to functional space objects in LEO and, ultimately, to the viability of the whole space economy.

The “security” concern that gains most attention is that of weaponisation of outer space. This is a distinct term from militarisation and remains as yet undefined. It could be suggested that “weaponisation” refers to the deployment or use of the types of weapons described above in outer space, but the term “weapon in outer space” has also not been universally defined. Though efforts have been made to define these terms, the very dual-use nature of space technology has made it difficult to draw a clear distinction between a peaceful space object and a hostile space weapon. For example, co-orbital drones can be used to repair or refuel aging satellites, or to destroy them. Consequently, there is no consensus as to what is a “space weapon” or if space is being “weaponised”. This, in turn, makes it difficult to determine whether or not an “arms race”—namely a competition between nations for superiority in the development and accumulation of weapons—exists. As will be discussed below, some see the development of counterspace capabilities as direct evidence that an arms race is underway, while others see such developments as

⁵ See Secure World Foundation, “Global Counterspace Capabilities: An Open Source Assessment”, April 2018. Available at : https://swfound.org/media/206118/swf_global_counterspace_april2018.pdf

⁶ UNIDIR Asia–Pacific Regional Seminar and Outreach Initiatives: “Ensuring Asia–Pacific’s Secure and Sustainable Use of Space: The Role of Norms of Behaviour”, Report, December 2012 p. 3, available at: <http://unidir.org/files/publications/pdfs/conference-report-kuala-lumpur-en-603.pdf>.

⁷ For more information, see “The Kessler Syndrome: As Discussed by Donal J Kessler” 8 March 2009, available at : <http://webpages.charter.net/dkessler/files/KesSym.html>.

incidental to the natural progression of space technology. What is certain, as noted above, is that the technology to target and neutralise assets in space has developed and diversified significantly over the last few years.

Since the use of a weapon, whatever it may be, might require intent, weaponisation of space is considered to be a security threat. Since debris cannot be controlled, and therefore cannot have an “intended” action, debris is considered generally to be a “safety” threat. However, space debris and weaponization are interlinked. Counterspace capabilities can lead directly to the creation of space debris, which in turn poses a threat to all space activities. Likewise, it is not hard to imagine situations where space debris could play a role in escalating tensions in a security crisis. It is for this reason that many dialogues on space safety and security increasingly feature common elements. Indeed, the notions of safety and security, as with everything else in space, become entangled due to the nature of the technology and the physical properties of the environment.

How are space activities regulated?

What are the laws, regulations and policies that apply to any given space activity. I group these into three levels: national, international and voluntary.

The most direct level of regulation for space activities is the national level. States are responsible for authorising and supervising their own nationals, whether they be government agencies or private actors. This usually takes the form of national laws and policies. For example, a satellite operator in Country X might need national authorisation to operate a satellite, authorisation to use radiofrequencies and an authorisation to sell telecommunications services. In addition, the launch service provider would need a launch license from its home country.

These regulations and policies must, of course, comply with obligations at the international level. These obligations are found mainly in the five treaties related to outer space activities. These are: the Outer Space Treaty, the Astronaut Rescue Agreement, the Liability Convention, the Registration Convention and the Moon Agreement.⁸ These instruments each have varying numbers of signatories, but it is generally agreed that the Outer Space Treaty is the foundation for all space activities.

Article III of the Outer Space Treaty also makes it clear that all space activities are to be carried out in accordance with international law, including the UN Charter. This means that the laws of *jus ad bellum* and *jus in bello* would also apply in space. However, since no conflict has yet emerged in space, there is no guidance on how such laws should be applied. For example, it is unclear what provocation would justify the destruction of a satellite as a “proportionate” response. There is an effort to shed some light on this at the moment, namely the drafting of a guide called the Woomera Manual, by a group of international experts meeting in Australia.

There are two other important instruments that impact space activities. First, the Constitution and Convention of the International Telecommunications Union, the UN organ that coordinates radio frequencies and slots in GEO. Secondly, the Limited Test Ban Treaty of 1963 prohibits the detonation of nuclear weapons in outer space. There also regional agreements and bilateral agreements, but I will refrain from discussing those here.

⁸ See UN Office for Outer Space Affairs : Treaties and Principles. Available at: <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html>.

In addition to national laws and outer space treaties, there are also a number of other non-legally binding tools that supplement existing rules in space. These voluntary instruments can take the form of declarations, guidelines or principles. Whilst adherence to these tools is not required, conduct in accordance therein is encouraged and seen to be within the bounds of responsible behaviour. Examples of these tools are the 1992 Principles on nuclear power sources, the 2002 The Hague Code of Conduct and the 2007 IADC Space Debris Mitigation Guidelines.

How does the UN address space activities?

Discussions within other UN bodies have generally proceeded along two distinct tracks or categories, though as you may have already surmised, these categories are not neatly segregated.

The first category is that of “peaceful uses of outer space”. The main UN body that considers issues under this category is the Committee of the Peaceful Uses of Outer Space, seated at the Vienna International Centre. Established by the General Assembly in 1959, COPUOS was tasked with reviewing international cooperation in peaceful uses of outer space, studying space-related activities that could be undertaken by the United Nations, encouraging space research programmes, and studying legal problems arising from the exploration of outer space. COPUOS has two main subcommittees that meet annually: the Scientific and Technical Subcommittee and the Legal Subcommittee. The UN Office for Outer Space Affairs serves as the COPUOS secretariat. All the major outer space treaties were negotiated under its mandate. At present, COPUOS is working to adopt a set of non-legally binding long-term sustainability guidelines. Some of the current issues on the COPUOS Agenda are: Ways and means of maintaining outer space for peaceful purposes; Spin-off benefits of space technology; space and water and space and climate. Within the General Assembly, issues referred by COPUOS are discussed within the Fourth Committee.

The second category of space activities discussed within the UN is those related to PAROS. Notably, discussions on PAROS have been carefully excluded from any of the proceedings of COPUOS. Instead, they were referred to the Conference on Disarmament, as the most appropriate body to discuss the issue of an arms race in outer space. I will not go into detail here, as this matter is the subject of my next presentation.

In addition to discussing issues related to space activities, numerous UN bodies also utilize space capabilities to facilitate their mandates around the world. For example, the Food and Agriculture organization, the Department of Peacekeeping Operations, and the UN development Programme all use space-based data and services to achieve their goals. Indeed, space capabilities are increasingly being seen as critical enablers for achievement of the UN Sustainable Development Goals. Objectives such as quality education; gender equality; decent work and economic growth; industry, innovation and infrastructure; are all goals that can be facilitated by outer space capabilities.

With that, I will stop here and am happy to answer any questions you may have.

PART II - A BRIEF HISTORY OF THE PREVENTION OF AN ARMS RACE IN OUTER SPACE

Origins of PAROS

Perhaps the earliest appearance at the UN of a reference to an “arms race in outer space” was in 1978, in the Final Document of the 10th Special Session on Disarmament. §80 noted that:

“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 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.”

As a result, in 1981, two Resolutions were adopted by the General Assembly that demonstrated divergent opinions that would define PAROS discussions for years to come.

The first Resolution (A/RES/36/97C), sponsored by the Western Europe and Others Group (WEOG), focused on the negotiation of “*an effective and verifiable agreement to prohibit anti-satellite systems*”. This proposal was introduced by Italy, who recommended that priority be accorded to elements such as “*anti-satellite systems designed to impair the functioning of, interfere with, damage or destroy satellites of other nations*”.⁹

The second Resolution (A/RES/36/99), sponsored by the Eastern European and other States, focused on the negotiation of a treaty prohibiting the stationing of weapons of any kind in outer space. This proposal was introduced by Mongolia. The USSR, who submitted a draft text for such a treaty, noted that only nuclear weapons or weapons of mass destruction were banned from being placed into orbit, and that a new treaty should be adopted to address this omission.¹⁰

These Resolutions split general opinion and there seemed little room for overlap. A reading of the summary of statements shows that, already, significant amounts of tension surrounded the topic of PAROS, particularly given the inherently opaque nature of military space activities and the development of anti-satellite capable technology. States called for these two Resolutions to be merged into one, but the lead sponsors of these resolutions held firm that each proposal had its own characteristics and merits and that the two Resolutions should be handled separately.

Establishment of an *Ad Hoc* Committee on PAROS

The following year, the General Assembly adopted a further Resolution (A/RES/37/83), calling on the CD to establish an *Ad Hoc* Committee on the subject of PAROS, with a view to undertaking negotiations for the conclusion of an agreement or agreements, as appropriate, to prevent an arms race in outer space. This did not happen immediately due to differences of opinion on the mandate of such a body. The Group of 21 and Eastern States wanted the *Ad Hoc* Committee to have a negotiating character, while the Western States favoured a mandate to consider relevant issues only as a prelude to more focused negotiations.¹¹

⁹ UN Yearbook – 1981, p. 81.

¹⁰ *Id.*

¹¹ Meyer, Paul, “The CD and PAROS : A Short History”, UNIDIR – The CD Series, April 2011, p.2.

However, in 1985, an *Ad Hoc* Committee on PAROS was finally established “to examine as a first step at this stage, through substantive and general consideration, issues relevant to the prevention of an arms race in outer space.”¹² This Committee adopted a three-part programme of work:

“(a) consideration of issues relevant to the prevention of an arms race in outer space;
(b) existing agreements relevant to the prevention of an arms race in outer space; and
(c) proposals and future initiative on the prevention of an arms race in outer space.”

While the Committee held 20 meetings that year, there was no agreement as to how discussions should continue in the future. The Group of 21 wished for the discussions to move on to negotiations in 1986, while other delegations preferred that the Committee’s mandate not expire in order to continue the exploratory work.¹³ This signalled the beginning of a decade of work for the Committee, until 1994.

In 1994, two sets of open-ended consultations were carried out by Friends of the Chair. The first, on terminology and other legal aspects, was led by a member of the Italian delegation, while the second, on confidence-building measures, was led by a member of the Russian delegation.¹⁴

The first set of consultations were asked to examine whether existing “space treaties” were sufficient to prevent an arms race in outer space and, if not, what kind of legal instruments could be adopted to fill in existing lacuna.¹⁵ Many delegations had found the lack of established terminology to be an issue, but the Italian Friend of the Chair concluded that legal terms were not a pre-condition for the adoption of new measures on PAROS.

The second set of consultations looked at confidence-building measures in three distinct clusters: namely:

- measures to improve transparency of pre-launch activities;
- “rules of the road” measures; and
- measures required for monitoring purposes in connection with a proposed code of conduct.¹⁶

The Russian Friend of the Chair also presented a resume of possible measures that could be adopted to increase confidence in space, contained in “*Draft Guidelines regarding measures on confidence-building and predictability in outer space activities*” (CD/OS/WP.69).

Despite the extensive work carried out, divisions among the Committee remained wide. On the one hand, members of the Group of 21 and China argued that existing legal instruments were not sufficient to prevent an arms race in outer space, noting in particular the possibility of deploying conventional weapons or new high-tech weapons such as lasers, very high frequency weapons and particle beams.¹⁷ These same States also expressed concern that the development of anti-ballistic missile defence systems would lead to anti-satellite systems. On the other hand, Western States argued that existing instruments already provided “an equitable, practical, balanced and extensive legal system for ensuring the use of outer space

¹² Conference on Disarmament, Report of the Ad Hoc Committee on Prevention of an Arms Race in Outer Space, document CD/642, 4 September 1985, §1.

¹³ *Id.* at §§ 52-55.

¹⁴ Conference on Disarmament, Report of the Ad Hoc Committee on Prevention of an Arms Race in Outer Space, document CD/1271, 24 August 1994, §10.

¹⁵ *Id.* at §10(a).

¹⁶ *Id.* at §10(b).

¹⁷ *Id.* at §12.

for peaceful purposes".¹⁸ This same group of States questioned whether there was even an arms race at all, or whether there was any indication of significant on-going developments by any State with respect to arms in space. These doubts called into question the need for a legally binding instrument on PAROS at all.

States were similarly divided on how they saw confidence-building measures, with some States seeing them as stepping stones towards a treaty, while others saw such measures as an end in and of themselves.¹⁹

Unable to reach any type of agreement, the last paragraph of the Report of the *Ad Hoc* Committee, the paragraph that would re-establish the Committee for 1995, was put into square brackets, amid claims that this action was not for substantive purposes. Nevertheless, the Committee was not re-established. In 1998, Canada proposed the establishment of another *Ad Hoc* Committee as an interim step, this time with a mandate to negotiate a convention on the non-weaponization of outer space, drawing a distinction from "militarisation" of outer space.²⁰ This proposal was not, however, taken up.

2000 – 2010

While the following years did not see much activity in plenary hearings, a number of useful working papers on PAROS were presented by Member States that would lay the basis for new work.

In 2000, China submitted a Working Paper entitled "*China's position on and suggestions for ways to address the issue of PAROS at the CD*".²¹ This paper sought to refute the claim that there was no arms race in outer space, arguing that military developments, if left unchecked, would lead to the weaponization of outer space. It also outlined several elements that might be used in a new legal instrument.

In 2002, China and Russia submitted a joint Working Paper entitled "*Possible elements for a future international legal agreement on the prevention of the deployment of weapons in outer space, the threat or use of force against outer space objects*".²² This text contained proposals on basic obligations, national measures for implementation, confidence-building measures and executive organisation of a future treaty. China and Russia carried out numerous consultations on this proposal over the next few years, and, in 2008, they unveiled a joint proposal for a draft treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT). This proposal laid out fourteen articles that might be used in a legally binding instrument, including the undertaking of States "*not to place in orbit around the Earth any objects carrying any kinds of weapon*" and "*not to resort to the threat or use of force against outer space objects*". Notably, the draft PPWT sought to define certain terms like "*outer space*", "*weapon*" and "*use of force*" in the outer space context. I will discuss this instrument in greater detail below.

¹⁸ *Id.* at §13.

¹⁹ *Id.* at §15.

²⁰ Conference on Disarmament, Canada Working Paper Concerning CD Action on Outer Space, CD/1487, 21 January 1998.

²¹ Conference on Disarmament, China Working Paper: China's position on and suggestions for ways to address the issue of PAROS at the CD, CD/1606, 9 February 2000.

²² Conference on Disarmament, China and Russia Working Paper: Possible elements for a future international legal agreement on the prevention of the deployment of weapons in outer space, the threat or use of force against outer space objects, CD/1679, 28 June 2002.

The US submitted remarks by way of reply, made by the then-Permanent Representative at an informal conference outside of the UN, reaffirming the US position that the existing outer space regime was sufficient and that it was not possible to develop an effectively verifiable agreement for the banning of either space-based “*weapons*” or terrestrial-based anti-satellite systems.²³ In 2014, a second draft of the PPWT was put forward with amendments that seek to address these concerns.

Subsequent to the introduction of the PPWT, Canada submitted two Working Papers, in 2007 and 2009, on the merits of transparency and confidence building measures.²⁴ In 2008, the EU had launched an initiative for a possible code of conduct for space activities but this text was never put before the CD.

Group of Governmental Experts on Outer Space TCBMs

In 2010, the General Assembly made renewed efforts on PAROS through the establishment of a Group of Governmental Experts (GGE) on Transparency and Confidence Building Measures for Outer Space Activities (A/RES/65/68). This GGE was to conduct a study, starting in 2012, on outer space TCBMs, without prejudice to the substantive discussions on PAROS. This GGE was comprised of fifteen members, on the basis of equitable geographical representation,²⁵ and, in 2013, reached consensus on a report containing recommendations for TCBMs. This report contained comments on the nature and purpose of TCBMs (for Governments to share information and build mutual trust)²⁶ and criteria for outer space TCBMs (should be aimed at increasing security, safety and sustainability in outer space).²⁷ It also took note of the fact that there are two types of TCBMs: those dealing with capabilities and those dealing with behaviour. The GGE report contains twelve specific recommendations for TCBMs, dealing with information exchange on space policies, information exchange and notifications related to outer space activities, risk reduction notifications and contact/visits to space launch facilities.

The GGE report encouraged States to seek additional means of implementing the TCBMs, whether through unilateral, bilateral or multilateral means.²⁸ It also recommended that the General Assembly transmit the report to other UN bodies dealing with space activities, such as COPUOS, the Disarmament Commission and the CD. Significantly, it suggested that the First and Fourth Committees hold a joint *ad hoc* session to address possible challenges to space security and sustainability. Two such meetings have taken place, in 2015 and again in 2017.

The work of the GGE on TCBMs has been the subject of two notable subsequent reports issued by the UN. The first was a Special Report by the Inter-Agency Meeting on Outer Space Activities (UN-Space) of the report of the GGE on TCBMs as pertaining to the UN system (A/AC.105/1116). The purpose of this document was to report on the role of the UN entities in supporting Member States in the implementation of TCBMs. It looked at how individual UN agencies were facilitating TCBMs in the categories of information

²³ Conference on Disarmament, Letter from the US: Comments on the Draft Treat on Prevention of the Placement of Weapons in Outer Space and the Threat or Use of Force Against Outer Space Objects (PPWT) as contained in Document CD/1839 of 29 February 2008, CD/1847, 26 August 2008.

²⁴ Conference on Disarmament, Canada Working Paper: Transparency and confidence building measures in outer space, CD/1815, 20 February 2007; Conference on Disarmament, Canada Working Paper: On the merits of certain draft transparency and confidence building measures and treaty proposals for space security, CD/1865, 5 June 2009.

²⁵ The countries that participated in the GGE on TCBMs for outer space were: Brazil, Chile, China, France, Italy, Kazakhstan, Nigeria, Republic of Korea, Romania, Russia, South Africa, Sri Lanka, Ukraine, UK, US.

²⁶ Report of the Group of Governmental Experts on Transparency and Confidence Building Measures in Outer Space Activities, A/68/189, §20.

²⁷ *Id.* at §31.

²⁸ *Id.* at §§68-72.

exchange on space policies; information exchange and notification procedures related to outer space activities, including risk reduction notifications; and contact and visits to space launch sites and facilities. The report also looked at how the UN provides intergovernmental platforms and mechanisms to pursue political initiatives, such as COPUOS and the Disarmament Commission, and capacity-building.

The second major report was issued by the Secretary-General to the General Assembly on national implementation of TCBMs in outer space (A/72/65). This report contained replies from Governments of Brazil, China, Cuba, El Salvador, France, Jordan, Paraguay, the UK, the US and the EU. This report highlighted the “*existing capabilities and gaps regarding the implementation of TCBMs*”, and to stress the need to put forth further efforts into implementation of TCBMs with a view to preventing an arms race in outer space.

It should also be noted that the UN Disarmament Commission has undertaken an initiative related to the GGE within its Working Group II, namely the preparation of recommendations to promote the practical implementation of TCBMs in outer space activities with the goal of preventing an arms race in outer space. This Working Group put TCBMs on its three-year Agenda for 2015-2017, and has renewed this mandate for the cycle of 2018-2020 term.

Revised text of the PPWT and “No First Placement”

As mentioned above, in 2014, China and Russia submitted a second draft text of the PPWT (CD/1985). This version of the text sought to address objections that had been raised in regards to the 2008 text and offer compromises, such as removal of the definition of the term “*outer space*”. One important feature of the PPWT is that it seeks to ban a type of behaviour rather than specific types of weapons.

As explained in their follow-up comments to the draft proposal (CD/2042), the aim of the PPWT is to ban the placement of weapons in outer space as well as the threat or use of force against space objects. In response to US concerns that the PPWT does not prohibit the development of ground-based ASATs, the Russians and Chinese have noted that, by banning any type of use of weapons against space objects, it makes the development of ASAT-capable technology “*pointless*”.²⁹ Regarding the issue of verification, China and Russia conceded that there is, at present, no effective means to verify compliance with the PPWT, but this has not stopped other instruments from being adopted, such as the Outer Space Treaty.³⁰ In any case, Article V of the new draft PPWT allows for the inclusion of a verification protocol, should technical means become available, and proposes the use of TCBMs as an interim step. This point reflects the position of States that see TCBMs as stepping stones towards a legally binding instrument and those States that see TCBMs as an end in and of themselves.

No further steps had been taken to discuss the PPWT in the CD or any other UN body until late last year when another GGE was established with the mandate “*to consider and make recommendations on substantial elements of an international legally binding instrument on PAROS, including, inter alia, on the prevention of the placement of weapons in outer space.*”³¹ This GGE is scheduled to meet in 2018 and 2019.

²⁹ Conference on Disarmament, Follow-up comments by the Russian Federation and China on the analysis submitted by the United States of America of the updated Russian-Chinese draft PPWT, document CD/2042, 11 September 2015, §7.

³⁰ *Id.* at §19-28.

³¹ “Further practical measures for the prevention of an arms race in outer space”, resolution adopted by the First Committee, 13 October 2017, A/C.1/72/L.54, http://www.un.org/ga/search/view_doc.asp?symbol=A/C.1/72/L.54.

However, one other important initiative emerged in 2014, namely that of “*No First Placement of Weapons in Outer Space*”, as introduced by Russia and Argentina (CD/1991). This is a unilateral initiative whereby States pledge not to first to place weapons of any kind in outer space and to make all efforts to prevent outer space from becoming an arena for military confrontation. As of today, 18 Member States have made this pledge, including Argentina, Brazil and Russia.

Other initiatives

In addition to the work within the CD, other UN bodies have sought to address PAROS either directly or indirectly. For example, the General Assembly has adopted a resolution every year since 1981, introduced by Egypt and Sri Lanka, entitled “*Prevention of an Arms Race in Outer Space*” (most recently, A/RES/72/26) by near unanimity.³² This resolution reaffirms the validity of pursuing further measures to ensure PAROS, but nothing more.

Perhaps the most tangible positive contribution to space stability in recent times has occurred in COPUOS, rather than disarmament forums. As noted earlier, Guidelines on the Long-Term Sustainability of Outer Space Activities (LTS) are being developed as a means of establishing best practices in space.³³ These guidelines address a variety of aspects of space activities, including sustainable space utilization, space debris mitigation, space operations, and tools to support collaborative space situational awareness. The LTS, however, do not speak directly to the dangers of a growing arms race in outer space and the Working Group has declined to address the issue of self-defence in any of the guidelines so far adopted.

Finally, one last notable effort that has sought to address the growing concerns of an arms race in outer space is the EU’s proposed draft International Code of Conduct for Outer Space Activities, mentioned earlier. This text was the EU’s response to a call from the Secretary-General in 2007 for concrete proposals for TCBMs. A draft text was put before the international community in 2012 as an *ad hoc* initiative, outside of the UN. This document sought to achieve a number of objectives with a single text, including greater adherence to existing international instruments on space activities; increased measures for safety, security and sustainability in outer space; and cooperative mechanisms.³⁴ While this initiative seemed to command support in principle from many countries, it has since lost momentum. It remains to be seen what future steps might be taken regarding this initiative. The last version of the text was released in 2015.

Conclusion

As this outline has shown, there has been significant discussion on PAROS in preceding decades and the contours of the debates, the issues and the areas of contention are well defined. I wish you success as you seek to renew consideration on PAROS, against a backdrop of unprecedented interest and engagement in outer space, and with a view to identifying common interests on which all States can agree.

³² This year, of the 193 possible votes, the resolution was adopted with 182 ‘yes’ votes, 3 abstentions and 8 non-votes. Voting record available at : <http://unbisnet.un.org:8080/ipac20/ipac.jsp?profile=voting&index=VM&term=ares7226>.

³³ Working Group on the Long-term Sustainability of Outer Space Activities: Preambular Text and Nine Guidelines, A/AC.105/C.1/2018/CRP.18/Rev.1, 8 February 2018.

³⁴ Draft International Code of Conduct for Space Activities, VERSION 31 March 2014.