SPACE LAW AND WEAPONS IN SPACE[1]

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Summary

Although legal principles to govern space were discussed as early as the mid-1950s, they were not formalised until the Outer Space Treaty 1967 (OST) was adopted and came into force.

The Outer Space Treaty establishes a number of principles affecting the placement of weapons in outer space. In particular it provides that "the Moon and other celestial bodies shall be used *exclusively* for peaceful purposes" and prohibits the testing of any types of weapons on such bodies. More generally the OST forbids the placement of nuclear weapons or other weapons of mass destruction in outer space. In addition there are a number of disarmament treaties and agreements emanating from the UN Office for Disarmament Affairs and the Conference on Disarmament that are relevant to weapons in space.

Although the disarmament provisions and international humanitarian laws place some restrictions on the use or manner of use of space weapons, none prohibit space weaponisation. The absence of such prohibition is not due to many attempts over the years to prevent an arms race in space. Notable among these are Prevention of an Arms Race in Space Draft Treaty (PAROS) and the Prevention of the Placement of Weapons in Space Draft Treaty (PPWT).

In considering the laws affecting space weapons a fundamental question that arises is what constitutes a weapon and does its placement in space breach the requirement that outer space be used exclusively for peaceful purposes. As an example, does a satellite used to control and direct an armed drone breach the peaceful use provision of the OST? There may be risks that without international norms governments and

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sub-state groups may acquire and use armed drones in ways that threaten regional stability, laws of war, and the role of domestic rule of law in decisions to use force. Given their orbital velocity, any object in space could be a weapon with capability to destroy a satellite or other space object. There is also a growing population of dual-use satellites with military as well as civilian applications. These present great difficulty in arriving at a workable definition of a space weapon in the formulation of a generally acceptable treaty.

Added to this, there are divergent views of the meaning of *peaceful use*. Some, in particular the United States, consider the meaning to be "non-aggressive" rather than "non-military."

This article will discuss the nature of weapons and other questions of laws affecting the placement of weapons in space, as well as the use of space assets for non-peaceful purposes.

Introduction

In the excitement and optimism at the dawn of the human venture into outer space, there was a widespread expectation that space would be an area free of conflict, and dedicated to peace. Proposals that space "would be used only for genuinely peaceful purposes and the common benefit of mankind ... were made respectively by the United States in 1957 and the Soviet Union in 1958."[2]

This article will show that despite such aspirations, military use of space was contemplated and marks many of the early technological developments by the United States and the USSR,[3] the two space powers. It will explore the international law governing the placement and use of weapons in space and examine the laws affecting the use of outer space for military purposes.[4] It will also point to areas where a lack of agreed definition has an impact, as well as complications arising from dual military and non-military use.

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2 Bin Cheng (1997) *Studies in International Space Law*, 514, Oxford University Press.

3 Union of Soviet Socialist Republics, with Russia its largest republic, formed in 1922 and dissolved in 1991.

4 See generally Sa'id Mosteshar (2008), Outer Space: Arena for War or Peace, *51 Proc. Int'l Inst. Space L.*, 199; and Sa'id Mosteshar (2005), Militarisation of outer space: Legality and Implications for Future of Space Law, *47 Proc. Int'l Inst. Space L.*, 473.

Law Governing Space

Prior to the adoption of the Outer Space Treaty,[5] the use of outer space[6] was subject to general international law. Members of the United Nations were bound by the terms of its Charter.[7] These laws continue to apply among members of the UN, but are modified for those States that are Parties to the Outer Space Treaty. General international law and the Charter of the United Nations, are a central part of the *corpus juris spatialis* along with the Outer Space Treaty, that provides:

States Parties to the Treaty 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 cooperation and understanding.[8]

It is clear that the Outer Space Treaty recognises that human activity in space did not take place in a legal void "for which every rule has to be newly fashioned." It has always been subject to general international law.[9]

In considering what laws apply to weapons in space, it is, therefore, first necessary to review relevant general international law before considering any specific legal restrictions or relaxations resulting from treaties or other international laws. States are sovereign, their own lawmakers and law-enforcement officers. Therefore, at the international level they cannot be cannot be bound by "some fiat from on high." Their actions can only be "made unlawful by the consent of the States concerned in the form of treaties or by the concurrence of the generality of States, including the dominant section of international society, in the form of general international law or what is traditionally called

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5 Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, January 27, 1967, 610 U.N.T.S. 205 ("Outer Space Treaty" or "OST").

6 Unless the context otherwise requires, in this article references to space are to be understood to be outer space, and include celestial bodies.

7 Bin Cheng (1997) *Studies in International Space Law*, 513, Oxford University Press; Elizabeth S Waldrop, (2004), Weaponization of Outer Space: US National Policy, *29 Annals Air & Space L.* 329 at 339.

8 Outer Space Treaty, Article III.

9 Bin Cheng (1997) *Studies in International Space Law*, 526, Oxford University Press. For a discussion of general international law see Bin Cheng (1994) *General Principles of Law as Applied by International Courts and Tribunals*, Cambridge University Press.

customary international law. This applies to the banning or limitation of weapons in outer space no less than to any other matter."[10]

General International Law

Save for the limitations introduced by space-related laws, international law contains no rule relating to the military use of space or the placement of any weapon in space. It follows that such uses are permitted, subject to observation of the rules of international law including, for members of the UN, the Charter of the United Nations.[11] This *inter alia* provides:

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.[12]

But it allows for self-defence:

Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security.[13]

Given the existing rules of general international law, which did not single out space from other areas of *res extra commercium* or *res nullius*,[14] it was unrealistic, although understandable, to expect that space would be entirely free of weapons or military use. However, international humanitarian and the *jus in bello* and *jus ad bellum* applicable to warfare apply equally in space.[15]

Lex Specialis – Law Specific to Outer Space

In the absence of any prohibition or limitation on the military use of outer space, or placement of weapons in outer space under general international law, it is

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10 Bin Cheng (1997) *Studies in International Space Law*, 523, Oxford University Press.

11 Blount, P J, Targeting in Outer Space: Legal Aspects of Operational Military Actions in Space, *Harvard National Security Features*, 3 (2012).

12 UN Charter, Article 2(4); Bin Cheng (1997) *Studies in International Space Law*, 513, Oxford University Press.

13 UN Charter, Article 51; Military Activities in Outer Space, *Polish Y B Int'l L* (1988), 259 at 267; R Lakeshanan (1985), Prohibition of Weaponisation of Outer Space, *28 Proc. on L. Outer Space* 68 at 75.

14 Subject to a common freedom of exploitation, or not yet the object of rights of any specific subject.

15 For a detailed discussion see Bill Boothby (2017), Space Weapons and the Law, 93 *Int'l L. Stud. Ser. US Naval War Col.* [i], 179.

necessary to consider whether any such restrictions exist under the specific laws governing outer space. International law relating to weapons and warfare do impose limitations on the nature of weapons and military actions, under humanitarian, environmental and other laws.[16]

A consistent theme that ran through international pronouncements on the use of outer space from the earliest days was that it should be *peaceful*. Apart from UN General Assembly Resolutions all referring to *peaceful uses of outer space*, the committee formed by the UN in 1958 to deal with space matters is named the *Committee on Peaceful Uses of Outer Space*.[17] However, there has been long-standing debate about the meaning of *peaceful* in this context. Furthermore, the main instrument of space law, the OST, does not extend its application to all activities in outer space to require that they be *peaceful*.

Three treaties are relevant to the issues of weapons in space. The OST is a set of principles and is very widely ratified. The Moon Agreement makes certain specific provisions expanding on the OST dealing with celestial bodies. The Liability Convention addresses liability arising from activities in space. Each is only binding on States Parties, that is, the States that have ratified them.

[16] See also Bill Boothby (2017), Space Weapons and the Law, 93 *Int'l L. Stud. Ser. US Naval War Col.* [i], 179.

[17] Usually referred to by its acronym COPUOS.

Outer Space Treaty

The Outer Space Treaty, also known as the Principles Treaty, sets out the fundamental principles governing activities in outer space. These closely follow the earlier General Assembly resolution of December 1963 on the subject. [18]

In relation to weapons, the Treaty provides:[19]

States Parties to the Treaty undertake not to place *in orbit around the Earth* any objects carrying *nuclear weapons* or any other kinds of *weapons of mass destruction*, install such *weapons on celestial bodies*, or *station* such weapons in outer space in any other manner. [20]

The Moon and other *celestial bodies* shall be used by all States Parties to the Treaty *exclusively for peaceful purposes*. The establishment of military bases, installations and fortifications, the testing of *any type of weapons* and the conduct of *military manoeuvres* on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the Moon and other celestial bodies shall also not be prohibited.

It should be noted that the rules applicable to "void" space and to celestial bodies, including the Moon, materially differ.

Void Space[21]

Unlike celestial bodies, void space as a whole is not restricted to *peaceful use*. Only certain weapons in void space are prohibited, and then only in a limited sense. The prohibition applies only to weapons of mass destruction, including nuclear weapons.[22] The term weapons of mass destruction generally encompasses nuclear, chemical, biological weapons and probably also radiological

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18 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, Resolution 1962 (XVIII) of 13 December 1963.

19 Outer Space Treaty, Article IV.

20 Emphasis added.

21 *Void space*, or *outer void space*, refers to the void between celestial bodies; see Bin Cheng (1997) *Studies in International Space Law*, 527, Oxford University Press.

22 Blount, P J, Limits on Space Weapons: Incorporating the Law of War into the *Corpus Juris Spatialis*, *Proceedings of the 51st Colloquium on the Law of Outer Space* (2009; revised 2014), http://ssrn.com/abstract=1393321 (accessed 11 February 2018); Fessler, E Anthony, (1979) Directed-Energy Weapons, *A Juridical Analysis*, pp. 56 New York. Setsuko Aoki (2017), Law and Military Uses of Outer Space, *Routledge Handbook of Space Law*, (Jakhu and Dempsey, Eds.), 197 at 204; Francis Lyall and Paul B. Larsen (2009), *Space Law: A Treatise* (Burlington: Ashgate) 515–516.

weapons but apparently not, for instance laser and other directed-energy weapons. Note also that the Nuclear Test Ban Treaty prohibits nuclear explosions in space.[23] At the time the Outer Space Treaty was drafted the UN definition of weapons of mass destruction was that of the UN Commission for Conventional Armaments.[24] . Others have since been discussed by the Conference on Disarmament and the UN Disarmament Commission.[25]

These may not be placed in Earth orbit or otherwise stationed in space. However, there is no restriction on conventional weapons.[26]

The Treaty does not prohibit the testing, development, deployment on Earth or perhaps even the deployment of ground-based nuclear systems designed for use in outer space or against space objects.[27] For this reason, no objection was raised by any State to the ASAT[28] tests conducted by China in 2007[29] or those by the United States in 2008.[30]

On January 11, 2007, the People's Republic of China (PRC) conducted its first successful direct-ascent anti-satellite (ASAT) weapons test in destroying one of its own satellites in space. On February 21, 2008 at 03:26 UTC, the Ticonderoga-class guided-missile cruiser USS Lake Erie fired a single SM-3 missile, hit and successfully destroyed the satellite, with a closing velocity of about 22,783 mph (36,667 km/h) while the satellite was 247 kilometres (133 nautical miles) above the Pacific Ocean. USS Decatur, USS Russell as well as other land, air, sea and space-based sensors were involved in the operation.

In relation to void space, the Outer Space Treaty does not require that it be used exclusively for peaceful purposes. It is permissible to use space for military or aggressive purposes. The Treaty does not require complete demilitarisation of outer space.[31]

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23 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, Oct. 10, 1963, Art. 1, 480 U.N.T.S. 43.

24 UN Doc. S/C.3/32/Rev.1 (18 August 1948).

25 See CD/2004 (10 September 2014).

26 Sa'id Mosteshar (2008), Outer Space: Arena for War or Peace, *51 Proc. Int'l Inst. Space L.*, 199. See also Sa'id Mosteshar (2005), Militarisation of outer space: Legality and Implications for Future of Space Law, *47 Proc. Int'l Inst. Space L.*, 473.

27 E Anthony Fessler (1979), Directed-Energy Weapons, *A Juridical Analysis*, 56 New York.

28 Anti-satellite system.

29 Shirley Kan, China's Anti-Satellite Weapon Test, *CRS Report for Congress*, RS22652 (23 April 2007).

30 OnWar.com, https://www.onwar.com/weapons/rocket/missiles/RIM-161-Standard-Missile-3.html (Accessed 12 February 2018).

31 Allan Rosas (December 1983), The Militarization of Space and International, *Journal of Peace Research*, Vol. 20, No. 4, 357 at 358; http://www.jstor.org/stable/424169 (Accessed 24 Jan 2018).

The Moon and Other Celestial Bodies

In contrast to void space, the use of celestial bodies[32] is reserved exclusively for peaceful purposes. It is prohibited to install or station any weapon of mass destruction on celestial bodies, and no weapon of any kind may be tested there. The Treaty is explicit in prohibiting military use of celestial bodies, disallowing the establishment of any military bases or structures and the conduct of military activities.[33]

However, the military may engage in scientific research or other peaceful activity. Military equipment and facilities can also be used when *necessary* for peaceful exploration of celestial bodies.

Moon Agreement

The Moon Agreement[34] reiterates the provisions of the outer Space Treaty in relation to weapons and military uses.[35] The Agreement provides:[36]

1. The Moon shall be used by all States Parties exclusively for peaceful purposes.
2. Any threat or use of force or any other hostile act or threat of hostile act on the Moon is prohibited. It is likewise prohibited to use the Moon in order to commit any such act or to engage in any such threat in relation to the Earth, the Moon, spacecraft, the personnel of spacecraft or man- made space objects.
3. States Parties shall not place in orbit around or other trajectory to or around the Moon objects carrying nuclear weapons or any other kinds of weapons of mass destruction or place or use such weapons on or in the Moon.
4. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the Moon shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the Moon shall also not be prohibited.

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32 In this article references to "celestial bodies" include the Moon.

33 Outer Space Treaty, Article IV, paragraph 2.

34 Agreement Concerning the Activities of States on the Moon and Other Celestial Bodies, 18 December 1979, 1363 UNTS 3; (Moon Agreement). Only 17 States have ratified the Moon Agreement as of December 2017.

35 Outer Space Treaty, Article IV, Paragraph 2.

36 Moon Agreement, Article 3.

It is important to note that references to the Moon and the provisions of the Moon Agreement include and apply to all celestial bodies within the *solar system*, except the Earth,[37] and include "orbits around or other trajectories to or around it."[38]

It has been suggested that the Moon Agreement could apply also to outer void space, by defining the Moon to include "orbits around or other trajectories to or around it."[39] Such interpretation would effectively prohibit militarisation of at least part of void space.[40]

However, in its consideration of the draft Moon Agreement and the definition of the "Moon," the Legal-subcommittee of COPUOS agreed "that the trajectories and orbits mentioned in Article 1, paragraph 2, do not include trajectories and orbits of space objects in Earth orbits only and trajectories of space objects between the Earth and such orbits."[41]

There have, however, been differing interpretations of the Legal Sub-committee's position. Canada in its Working Paper before the Conference on Disarmament in 1985[42] expressed the view that establishing military bases, installations and fortifications, the testing of any type of weapons or any conduct of military manœuvres would be prohibited in the residual orbits and trajectories within the solar system.[43]

At the Conference on Disarmament in 2006 China and Russia interpreted these provisions as not restricting weaponisation of void outer space in a joint Working Paper.[44] Their view, which may be taken to be prevailing and better view, is that the provisions of Articles 3(2) and 3(4) " ... prohibit only tests and use of weapons of any kind on the Moon, and the use of such weapons from the Moon against the Earth, spacecraft and the personnel. However, activities of such kind in

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37 Moon Agreement, Article 1(1). An exception to this provision is where specific legal norms apply.

38 Moon Agreement, Article 1(2).

39 Moon Agreement, Article 1(2).

40 See Setsuko Aoki (2017), Law and Military Uses of Outer Space, Routledge Handbook of Space Law, (Jakhu and Dempsey, Eds.), 197 at 205.

41 UN Doc. A/34/20 (1979), paragraph 63; http://www.unoosa.org/pdf/gadocs/A_34_20E.pdf (Accessed 15 February 2018).

42 CD/618, CD/OS/WP.6 (23 July 1985) at 11.

43 Setsuko Aoki (2017), Law and Military Uses of Outer Space, Routledge Handbook of Space Law, (Jakhu and Dempsey, Eds.), 197 at 205.

44 CD/1780 (22 May 2006); https://documents-dds-ny.un.org/doc/UNDOC/GEN/G06/615/98/PDF/G0661598.pdf?OpenElement.

the Moon orbit and in outer space other than the Moon are not covered."[45] They further express the view that Article 3(3) "bans only the deployment of weapons of mass destruction on the Moon and in its orbit, but does not deal with weapons of other kinds."[46]

Liability Convention

The Liability Convention is mentioned here briefly because if military action in space causes damage by a space object, making the relevant State potentially liable for that damage.

It has been argued that the absolute liability provision of the Liability Convention[47] could require compensation for space-based attacks against ground or air-based targets.[48] However, belligerents incur no liability for lawful attacks on military objectives. Further, self-defence, duress, necessity and other lawful acts could also apply to negate liability. Although it has been suggested that absolute liability would only be suspended *vis-à-vis* military space activities and might remain applicable to civil space activities.[49]

Absolute liability would apply to belligerents for damage caused in violation of international humanitarian law.[50]

Interpretation of the Terms 'Peaceful Use' and 'Weapon'

An examination of the international legal rules applicable to the placement or use of weapons in space requires understanding of the terms used and their context. The terms *weapons* and *peaceful* are clearly of primary importance.[51]

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45 CD/1780 (22 May 2006), paragraph 11.

46 CD/1780 (22 May 2006), paragraph 13.

47 Convention on International Liability for Damage Caused by Space Objects (Liability Convention); adopted by General Assembly Resolution 2777 (XXVI) 29 November 1971. Absolute liability for damage on surface of the Earth or to aircraft in flight provided in Article II.

48 R. Ramey (2000), Armed Conflict on the Final Frontier: The Law of War in Space, *Air Force Law Review* 48, 1 at 90. See generally Michael N. Schmitt (2006), International Law and Military Operations in Space, 10 *Max Planck UNYB* 89; http://www.mpil.de/files/pdf3/04_schmittii1.pdf.

49 Michel Bourbonnière (2005), National Security Law in Outer Space: The Interface of Exploration and Security, *Journal of Air Law and Commerce* 70, 3 at 20 *et seq*.

50 Hague Convention (IV) of 1907 respecting the Laws and Customs of War on Land, 18 October 1907, 36 Stat. 2295, Article 3. The Convention is now regarded as part of general international law, applicable to non-parties.

51 Bin Cheng (1997) *Studies in International Space Law*, 513, Oxford University Press.

Although there are numerous references to *peaceful use* of outer space in treaties and resolutions affecting outer space, in none is the term defined. In the present context, nor is *weapon*.

Peaceful Use

At the outset of space activities it was clear that they provided great military advantages. With time these advantages have become increasingly apparent and gained importance.

In their rhetoric and laws governing space activities, States continue to aver that space activities are to be conducted for peaceful purposes and for the benefit of mankind. However, in their actions and policies, States, particularly the major space faring States, pursue military objectives in outer space.[52] Many States use Earth observation and other types of satellites, space vehicles, or space stations for military purposes.[53] In void space, States are perfectly entitled to do so, and such use does not breach international law or obligations under the Outer Space Treaty.

Nevertheless, the United States has gone to great lengths to promote the interpretation of "peaceful" as "non-aggressive" rather than non-military or civilian. This interpretation, even though used by the United States for many years without objection by others, does not amount to acceptance by other States or form part of general international law. It has been cogently argued that this interpretation by the United States is unnecessary, wrong and potentially noxious.[54]

If, contrary to the US interpretation, 'peaceful' means 'non-military' (and not 'non-aggressive'), States are

"... perfectly entitled to conduct any military activity, including exercises and manœuvres in outer void space, and to test, deploy and station there any number of military reconnaissance satellites, early warning satellites, meteorological satellites, communications satellites, geodetic satellites, navigation satellites, anti-satellite weapons (ASAT), ballistic missile defence (BMD) systems, permanently manned

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52 Allan Rosas, The Militarization of Space and International, *Journal of Peace Research*, Vol. 20, No. 4 (December 1983), 357 at 362, http://www.jstor.org/stable/424169 (Accessed 24 Jan 2018); Bin Cheng (1997) *Studies in International Space Law*, 520, Oxford University Press.

53 See Allan Rosas (December 1983), The Militarization of Space and International, *Journal of Peace Research*, Vol. 20, No. 4, 357 at 358; http://www.jstor.org/stable/424169 (Accessed 24 Jan 2018).

54 For a full and clear discussion of this usage and relevant international law see Bin Cheng (1997) *Studies in International Space Law*, 520, Oxford University Press.

space stations, and any other kind of weaponry or device, all either partly or exclusively for military purposes."[55]

Weapon

There is no general agreement on the definition of "space weapon."[56]

The dynamics of space and the laws of physics render virtually any object in space a potential weapon. Also, space systems are increasingly designed or deployed with dual-use capability, and many are used for both civilian and military purposes.

The Canadian Permanent Ambassador to the Conference on Disarmament articulated some of the factors that can be relevant in defining whether an object is a space weapon to include:[57]

a. Description of the device;

b. The intended effect of the device; and

c. The method by which the effect is achieved.

In turn this would involve consideration of:

a. *Severity* of the action and its effect (level of destruction or permanence);

b. *Method* of achieving the intended effects (kinetic or directed energy);

c. *Design* versus *intent*, distinguishing between objects designed for an offensive purpose, and those used with the intention of causing harm.

A major point of contention is whether weapons on Earth aimed at space objects are "space weapons." An increasingly accepted definition of *space weapon* includes:

a. Terrestrial- and space-based weapons that can attack or negate on-orbit space systems (ASAT); and

b. Space-based weapons that can attack or negate targets on the surface of the Earth.[58]

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55 Bin Cheng (1997) *Studies in International Space Law*, 530, Oxford University Press.

56 Elizabeth S. Waldrop (2004), Weaponization of Outer Space: US National Policy, *29 Annals Air & Space L.*, 329. For a detailed discussion of space weapons and technologies, means and methods of warfare, see Bill Boothby (2017), Space Weapons and the Law, 93 *Int'l L. Stud. Ser. US Naval War Col.* [i], 179.

57 Paul Meyer (26 August 2004), Space Security and the Prevention of an Arms Race in Outer Space, *Statement to the United Nations (UN) Conference on Disarmament (CD)*; www.reachingcriticalwill.org/images/documents/Disarmament-fora/cd/2004/statements/26AugustCanada.pdf (Accessed 14 February 2018).

However, it is not clear that all States accept that ground-based weapons directed at objects in space (ASATs) are *space weapons*.[59] In monitoring of space weapons, and in determining whether an action is legal, a clear definition of what amounts to a weapon needs to be defined.[60]

Other definitions include that suggested by the United Nations Institute for Disarmament Research:[61]

A space weapon is a device stationed in outer space (including the Moon and other celestial bodies) or in the earth environment designed to destroy, damage, or otherwise interfere with the normal functioning of an object or being in outer space, or a device stationed in outer space designed to destroy, damage, or otherwise interfere with the normal functioning of an object or being in the earth environment. Any other device with the inherent capacity to be used as defined above will be considered a space weapon.

This definition has been criticised as too broad. The last sentence could arguably cover any space object.[62]

Ballistic missiles that arc through space are not classed as space weapons. Rockets that orbit and that can attack satellites or missiles are so classified.[63]

A space weapon could also be one that does not cause physical damage but destroys the target's command, control and space surveillance equipment, which are vital to the efficient operation of spacecraft and missiles.[64] This includes *any device* with the "inherent capability" to "destroy, damage, or otherwise interfere with the

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58 Elizabeth S. Waldrop (2004), Weaponisation of Outer Space: US National Policy, *29 Annals Air & Space L.*, 329 at 334, citing John Hyten and Robert Uy (Summer 2004), Moral and Ethical Decisions Regarding Space Warfare, *Air & Space Power Journal*.

59 The CD has had considerable difficulty in arriving an acceptable definition of anti-satellite weapons, or ASAT; see Setsuko Aoki, Law and Military Uses of Outer Space, *Routledge Handbook of Space Law*, (Jakhu and Dempsey, Editors) (2017), 197 at 209.

60 For a detailed classification of space weapons see Ulf Ekblad (1992), Prospects of Verifying Space Weapons Treaties, 35 *Proc. on L. Outer Space* 346.

61 See Patrick M Cronin (2009), Global Strategic Assessment 2009: America's Security Role in a Changing World, 79.

62 Abdul Rehman Khan (2017), Space Wars: Dual-Use Satellites, *14 Rutgers J. L. & Pub. Pol'y*, 314 at 331. As indicated above, the velocity of objects in space, about 27,000 kilometres per hour (17,000 Miles per hour), can cause significant damage to a satellite or other space object were there to be a conjunction between them.

63 Richard L. Garwin (September 2001), Space Weapons or Space Arms Control? *Proceedings of the American Philosophical Society*, Vol. 145, No. 3, pp. 243-259 American Philosophical Society, http://www.jstor.org/stable/1558107 (accessed 24 January 2018).

64 Bhupendra Jasani (2002), Military Use of Outer Space, *27 Annals Air & Space L.* 347 at 360.

normal functioning of an object or being in outer space" or in the earth environment from outer space.[65]

Arriving at a workable and internationally acceptable definition of *space weapon* has become more challenging with the development of active debris removal (ADR) and of satellite servicing systems. Both such systems have the capability to alter the functioning and orbit of the target space object.

Military Uses of Space

Militarisation, or the use of outer space for military purposes has occurred since the inception of human activity in space. Soon after the end of the Second World War the United States and the Soviet Union embarked on development of military satellites. Both launched reconnaissance satellites early in the 1960s. The United States Corona satellites and the Soviet Union's Zenit satellites date to the 1950s and were early examples of military recognisance satellites. The US satellite program's initial system, GAMBIT 1, first launched in 1963 carrying a KH-7 camera system that included a 77-inch focal length camera. [66]

Space systems used for military purposes include reconnaissance, meteorological, communication and navigation satellites, ballistic missile defence and anti-satellite weapons (ASATs).[67]

The primary focus of the two space-active States was military with military satellite launches accounting for three quarters of the total during the Cold War.[68] Due mainly to increasing commercial satellites the percentage of exclusively military satellites has reduced, although military use of space has not. Many dual-use satellites are used by the military and carry military payloads.[69]

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65 Paul B Stares (1991), The Problem of Non-Dedicated Space Weapons, *Peaceful and Non-Peaceful Uses of Space - Problems of Definition for the Prevention of an Arms Race*, (Bhupendra Jasani, Editor), 147 at148.

66 See Roger Guillemette (18 September 2011), Declassified US Spy Satellites Reveal Rare Look at Secret Cold War Space Program, Space.com; https://www.space.com/12996-secret-spy-satellites-declassified-nro.html.

67 Bhupendra Jasani (2002), Military Use of Outer Space, *27 Annals Air & Space L.* 347 at 360; Bill Boothby (2017), Space Weapons and the Law, 93 *Int'l L. Stud. Ser. US Naval War Col.* [i], 179.

68 Setsuko Aoki (2017), Law and Military Uses of Outer Space, *Routledge Handbook of Space Law*, (Jakhu and Dempsey, Editors), 197.

69 See Dual-Use Satellites.

Militarisation vs Weaponisation

In considering the legal status of outer space, it is important also to distinguish *weaponisation* from *militarisation*. Space weaponisation, is always a form of militarisation, but space militarisation, that is the use of space by military spacecraft, does not necessarily involve space weaponisation.[70]

Space weaponisation has been defined as referring "to the placing in outer space for any length of time any device designed to attack man-made targets in outer space or in the terrestrial environment."[71]

Military use of outer space began when the US launched its first military observation satellite in 1960. This was followed by the Soviet Union launching a similar spacecraft in 1962. The first indication of the potential for aggressive action in outer space came from the Soviet Union when it tested an anti-satellite (ASAT) weapon in October 1968, exactly one year after it had signed the 1967 Outer Space Treaty.[72]

Drones

Drones or Unmanned Aerial Vehicles (UAVs) are generally not space objects, although the United States has used drones in space for some time, ostensibly to test propulsion systems and materials.[73]

Space controlled drones are now almost routinely used in warfare. But there is no space law prohibition on such use. The more difficult aspect of their use is compliance with International Humanitarian Law.[74]

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70 Abdul Rehman Khan (2017), Space Wars: Dual-Use Satellites, *14 Rutgers J. L. & Pub. Pol'y*, 314 at 329.

71 I A Viasic (1995), Space Law and Military Applications of Space Technology, in *Perspectives on Int'l L*, 386 n. 6 (N Jasentuliyana, ed.).

72 Bhupendra Jasani (2002), Military Use of Outer Space, *27 Annals Air & Space L.* 347. Jasani also provides a list of the types of satellites used by the military, at 349 *et seq*.

73 Elizabeth Howell (2 June 2015), *What is a Drone?*, Space.com; https://www.space.com/29544-what-is-a-drone.html.

74 Stephanie Quine (23 August 2012) reporting comments by Professor Steven Freeland, "Difficulties in applying international humanitarian law to cyber attacks and targeted killings by drones were two subjects discussed last night at a seminar hosted by the Australian Red Cross and King & Wood Mallesons," Lawyers Week; https://www.lawyersweekly.com.au/news/10622-law-unclear-on-drone-strikes.

Dual-use Satellites

Dual Military and Civilian Use

Virtually all space objects are dual-use, and may be used for military or civilian purposes. Commercial space systems provide extensive services to the military.[75] For example, the majority of commercial Earth Observation data is acquired by governments.[76] Such data has reconnaissance and military application.

The continued use of commercial space systems was confirmed at a conference by Maj. Gen. Robert Dickman, US Air Force deputy secretary for space, who stated that

> "the Pentagon would continue to build its own satellites for national security and economic reasons, but 80 percent of its capacity during the Iraq war was provided by commercial satellite operators, and that trend would continue." [77]
> During the 2004 Iraq war, 68% of munitions were satellite guided (up from 10% in the 1991 Iraq War). [78]

Multi-State Use

Complications arise where multiple States use a single dual-use space system. A question arises whether if one of the States uses the system as a weapon, can the system as a whole to be treated as a weapon.

The placement of weapons, including dual-use satellites, in void space, does not breach international law *per se*. A difficulty arises in assessing whether such satellites can be legitimate military targets. The answer to this question lies in the international law of warfare, which applies in space as it does on Earth. [79]

Traditional war theory would apply the proportionality rule to dual-use satellites.[80] This involves balancing civilian harm against military benefit and

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75 E. Waldrop (2004), Integration of Military and Civilian Space Assets: Legal and National Security Implications, *Air Force Law Review* 54, 157 at 166-167.

76 This was estimated to be between 60% and 80% in 2003; see United States Air Force (2003), *Transformation Plan*, at 60. See also Michael N. Schmitt (2006), International Law and Military Operations in Space, 10 *Max Planck UNYB* 89; http://www.mpil.de/files/pdf3/04_schmittii1.pdf.

77 Rueters Science (3 June 2003), Iraq War Boosts Space Spending, Wired.com; https://www.wired.com/2003/06/iraq-war-boosts-space-spending/

78 Postnote (December 2006), Military Use of Space, Parliamentary Office of Science and Technology; https://www.parliament.uk/documents/post/postpn273.pdf

79 Outer Space Treaty, Article III.

80 Abdul Rehman Khan, Space Wars: Dual-Use Satellites, *14 Rutgers J. L. & Pub. Pol'y* 314 at 333

necessity. Given the growing dependence on satellite communication and information in modern civilian life, these factors need to be included in proportionality analysis. Consequently attacks against satellites invoke the requirements of international humanitarian law.[81] It may therefore be that the balance of proportionality will generally be against attacks on satellites.

A further consideration relevant to any kinetic attack of a satellite is the creation of debris. Any such action, therefore, will affect not only the target satellite but also potentially all satellites. It is arguable that direct attacks on satellites in Earth orbit are contrary to the requirement that States "shall conduct their activities in outer space, including the Moon and other celestial bodies, with due regards to the corresponding interest of all other States," and thus would be in breach of international law. [82]

De-Weaponisation of Space

Efforts in the United Nations to maintain outer space for peaceful purposes began in 1957, months prior to the launch of the first artificial satellite into Earth's orbit. Early proposals for prohibiting the use of space for military purposes and the placement of weapons of mass destruction in outer space were considered in the late 1950s and early 1960s by the United Nations.[83]

Over the years there have been several attempts to prevent the development or use of space weapons. Two notable proposals have been made with Russian and Chinese participation and backing, namely the Prevention of an Arms Race in Space Draft Treaty (PAROS) and the Prevention of the Placement of Weapons in Space Draft Treaty (PPWT). From early in the 2000s there has been growing discussion of means by which space can be made safer and sustainable through Transparency and Confidence Building Measures (TCBMs).

(2017).

81 International Humanitarian Law ("IHL") is largely contained in a series of conventions comprising the several Geneva Conventions and two Hague Conventions. See Dietrich Schindler & Jiri Toman eds., *The Laws of Armed Conflicts: A Collection of Conventions, Resolutions and Other Documents* (Leiden: Martinus Nijhoff, 2004); Frans Von der Dunk and Fabio Tronchetti, *Handbook of Space Law* (Elgar) 2015, pp 350-359.

82 Outer Space Treaty, Article IX.

83 United Nations Office for Disarmament (UNODA), https://www.un.org/disarmament/topics/outerspace/.

It is clear that new agreements or treaties are needed if outer space is to be free of weapons. A consensus may arise that military use of space *per se* is not objectionable, and may contribute to avoidance of civilian casualties.

Prevention of an Arms Race in Space

Following a series of UN General Assembly resolutions[84] requesting the Conference on Disarmament (CD) to do so, the CD formed the *ad hoc* Committee on Prevention of an Arms Race in Outer Space (PAROS) in 1985. It aimed to negotiate and conclude one or more agreements to prevent an arms race in all its aspects in outer space.[85] The program of work of this *ad hoc* Committee was formally accepted at the second session in 1986 and maintained until 1994, the last year the *ad hoc* Committee convened. Subsequently, discussions have been conducted in the plenary and informal plenary meetings under the agenda item "Prevention of an Arms Race in Outer Space."[86]

One commentator has observed[87] that

> "a prime reason why so little headway is being made in the prevention of such a pre-arms race is that, as of now, what has to be prevented is predominantly a race in certain advanced technologies and not in 'arms' properly so called. The negotiations have almost entirely ignored this inconvenient fact."

Prevention of Placement of Weapons in Outer Space

In 2002 Russia and China jointly submitted to the CD a Proposal for a Treaty to Prevent the Deployment of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects.[88] It was aimed at banning certain behaviour rather than

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84 UN Doc. A/RES/37/83 (9 December 1982). Two more UNGA resolutions were needed to set up an *ad hoc* PAROS Committee. UN Doc. A/RES/38/70 (5 December 1983); UN Doc. A/RES/39/59 (12 December 1984). For a detailed account see Setsuko Aoki, Law and Military Uses of Outer Space, *Routledge Handbook of Space Law*, (Jakhu and Dempsey, Editors) (2017), 197 at 207.

85 Nuclear Threat Initiative (29 September 2017), Proposed Prevention of an Arms Race in Outer Space (PAROS) Treaty; http://www.nti.org/learn/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/ (Accessed 24 January 2018).

86 See also Elizabeth S. Waldrop (2004), Weaponization of Outer Space: US National Policy, *29 Annals Air & Space L.*, 329.

87 Julie Dahlitz (June 1988) Preventing Space Weapons, Journal of Peace Research, Vol. 25, No. 2, pp. 109-114, Sage Publications; http://www.jstor.org/stable/423913.

88 Working Paper Presented by the Delegations of China, Russia, Vietnam, Indonesia, Belarus, Zimbabwe and Syria, CD/1679 (28 June 2002), Referred to as the First PPWT; https://documents-

weapons in space. An updated and more detailed Draft Treaty on PPWT was submitted by Russia and China in 2008.[89]

The third and most recent Draft PPWT was submitted by Russia and China in 2014.[90] The United States opposed the Draft PPWT on a number of grounds, including the absence of any means of compliance verification, its scope and omission to address ASATs, regarded as the most pressing issue by the United States.[91] In their response[92] Russia and China indicated the proposed PPWT was not intended to address specific weapons, and pointed to the Outer Space Treaty in relation to lack of verification mechanism.

The third Draft PPWT forbids States Parties from:

i. Placing any weapons in outer space;

ii. Resorting to the threat or use of force against "outer space objects" of States Parties to the PPWT;

iii. Engaging in outer space activities inconsistent with the objects and purposes of the PPWT; and

iv. Assisting or inducing other States and international governmental organizations as well as non-governmental organizations and entities to participate in activities inconsistent with the objects and purposes of the PPWT.[93]

By a resolution[94] of the UN General Assembly, a new Group of Government Experts (new GGE) is to be established to review the third PPWT Draft, and to issue recommendations on the creation of a legally binding treaty for the prevention of an

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dds-ny.un.org/doc/UNDOC/GEN/G02/624/84/PDF/G0262484.pdf?OpenElement (accessed 24 January 2018).

89 Draft Treaty presented by the Delegations of China and Russia, CD/1839 (2 February 2008), Referred to as the Second PPWT; https://documents-dds-ny.un.org/doc/UNDOC/GEN/G08/604/02/PDF/G0860402.pdf?OpenElement (accessed 24 January 2018).

90 Draft Treaty presented by the Delegations of China and Russia, CD/1985 (12 June 2014), Referred to as the Third PPWT; https://documents-dds-ny.un.org/doc/UNDOC/GEN/G14/050/66/PDF/G1405066.pdf?OpenElement (accessed 24 January 2018).

91 Analysis of the 2014 Russian-Chinese draft "treaty on the prevention of the placement of weapons in outer space, the threat or use of force against outer space objects" (PPWT) (CD/1985), CD/1998 (3 September 2014).

92 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, CD/2042 (14 September 2014); https://documents-dds-ny.un.org/doc/UNDOC/GEN/G15/208/38/PDF/G1520838.pdf?OpenElement (accessed 24 January 2018).

93 Article II.

94 Further practical measures for the prevention of an arms race in outer space (13 December 2017), UN Doc A/C.1/72/L.54; https://undocs.org/A/C.1/72/L.54 (accessed 24 January 2018).

arms race in space and of the placement of weapons in outer space.[95] The Resolution was opposed by, among others, the United States and the United Kingdom, for similar reasons as the US opposition to the Third Draft PPWT.[96]

It remains to be seen whether the matter can be resolved once the new GGE has reported, probably in 2019 or 2020. The focus appears to be on creating a series of measures to achieve transparency and confidence (TCBM) among nations.

Transparency and Confidence Building Measures

In 1993 the UN established a Group of Government Experts (GGE) to examine and report on steps necessary to ensure continued security and sustainability of outer space. The GGE reported in 2013,[97] recommending measures to be taken by States to achieve a secure and sustainable space environment that underpins a growing number of terrestrial infrastructures and human activity. In relation to space weapons the report states:

The Group acknowledged that the existing treaties on outer space contain several transparency and confidence-building measures of a mandatory nature. Non-legally binding measures for outer space activities should complement the existing international legal framework pertaining to space activities and should not undermine existing legal obligations or hamper the lawful use of outer space, particularly by emerging space actors.

The Group further agreed that such measures for outer space activities could contribute to, but not act as a substitute for, measures to monitor the implementation of arms limitation and disarmament agreements.

The GGE recommended States and international organisations to voluntarily adopt the measures in addition to the observation of their international obligations.

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95 The Ministry of Foreign Affairs of the Russian Federation (25 December 2017), Press release on the adoption by the UN General Assembly of a resolution initiated by Russia and China "Further practical measures for the prevention of an arms race in outer space."

96 The United States Mission to the United Nations (20 October 2017), Explanation of Vote in the First Committee on Resolution L.54: Further Practical Measures for the Prevention of an Arms Race in Outer Space;" https://usun.state.gov/remarks/8085.

97 Report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities, A/68/189 (29 July 2013); http://undocs.org/A/68/189 (Accessed 24 January 2018).

As intended by the GGE, the report has been circulated to UN entities concerned with disarmament.[98]

A Capacity Building Network was proposed by the Science and Technology Subcommittee (STSC) of COPUOS at its fifty-fifth session,[99] expected to comprise university, research institution, museum, non-governmental organizations and others to deliver capacity-building and awareness raising activities related to space and the sustainable development goals. It is expected that United Nations Office of Outer Space Affairs (UNOOSA) will invite interested bodies to participate in the first half of 2018.[100]

Draft Guidelines for Long-term Sustainability of Outer Space

The Working Group of the STSC of COPUOS has produced a set of guidelines for the long-term sustainability of outer space.[101] The Guidelines are divided into two parts. Part A comprises guidelines adopted by the Committee, and Part B includes those still under discussion. Among the guidelines under discussion is Guideline 7, that aims to make outer space open *solely* to peaceful activity, calling on States and international Intergovernmental Organisations to:[102]

Provide, in national legal and/or policy frameworks, for a commitment to conducting space activities solely for peaceful purposes

In effect this would extend the regime under the Moon Agreement to outer void space. However, it would not necessarily prohibit the placement of weapons, other than weapons of mass destruction, in outer void space.

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98 See Peter Martinez, Richard Crowther, Sergio Marchisio and Gérard Brachet, Criteria for Developing and Testing Transparency and Confidence-Building Measures (TCBMs) for Outer Space Activities, Space Policy 30 (2014) 91-97, Elsevier. See also Christopher Johnson, (April 2014), The UN Group of Government Experts on TCBMs, Secure World Foundation Fact Sheet, SWF.

99 Capacity-Building Network: Description and Roadmap (31Janaury 2018), UN Doc A/AC.105/C.1/2018?CRP.12; http://www.unoosa.org/res/oosadoc/data/documents/2018/aac_105c_12018crp/aac_105c_12018crp_12_0_html/AC105_C1_2018_CRP12E.pdf (accessed 18 February 2018).

100 Capacity-Building Network: Description and Roadmap (31Janaury 2018), Section IV (14), UN Doc A/AC.105/C.1/2018/CRP.12; http://www.unoosa.org/res/oosadoc/data/documents/2018/aac_105c_12018crp/aac_105c_12018crp_12_0_html/AC105_C1_2018_CRP12E.pdf (accessed 18 February 2018).

101 A/AC.105/C.1/L.362, (21 June 2017); Revised (10 October 2017), A/AC.105/C.1/L.362/Rev.1; http://www.unoosa.org/res/oosadoc/data/documents/2017/aac_105c_1l/aac_105c_1l_362rev_1_0_html/AC105_C1_L362Rev01E.pdf (accessed 24 January 2018).

102 Guidelines for the long-term sustainability of outer space activities (10 October 2017), A/AC.105/C.1/L.362/Rev.1.

International Code of Conduct against Ballistic Missile Proliferation

The International Code of Conduct against Ballistic Missile Proliferation[103] (Hague Code of Conduct or HCoC) is a non-legally binding voluntary code that applies not only to ballistic missiles, but also to Space Launch Vehicles (SLVs).[104] It is an early embodiment of TCBM in relation to SLVs. The Code calls for pre-launch notifications of launches and test flights of ballistic missiles and SLVs, and also for States to provide annual declaration of their SLV policies as well as information on the SLV launches and test flights of the preceding year.[105] It also recommends that Subscribing States[106] invite international observers to their launch sites. The UN has welcomed the HCoC, confirming its importance in a number of resolutions.[107]

International Code of Conduct for Outer Space Activities

In 2008 the European Union (EU) proposed a draft code of conduct for space activities[108] that was subsequently modified, following international discussions.[109]

The ICoC is being negotiated outside the UN, as is the case with HCoC. It addresses both civilian and military activities. Its stated purpose is:

... to enhance the safety, security, and sustainability of all outer space activities pertaining to space objects, as well as the space environment.[110]

The ICoC includes some Transparency and Confidence Building Measures, providing:

This Code establishes transparency and confidence-building measures, with the aim of enhancing mutual understanding and trust, helping both to prevent confrontation and foster national, regional and global security and stability, and is

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[103] HCoC (6 February 2003) UN Doc. A/57/724; HCoC Text last updated November 2012; http://www.hcoc.at/?tab=what_is_hcoc&page=text_of_the_hcoc (accessed 24 January 2018).
[104] HCoC, Articles 4 (a)(i) and 4 (a)(ii) respectively.
[105] HCoC, Articles 4 (a)(iii).
[106] As of June 2016 HCoC had 139 Subscribing States, including the United States and Russia, but not China.
[107] UN Doc. A/RES/59/91 (3 December 2004); UN Doc. A/RES/67/42 (4 January 2013) and UN Doc. A/RES/69/44 (11 December 2014).
[108] Council of the EU, 17175/08, PESC 1697, CODUN 61 (17 December 2008).
[109] Draft International Code of Conduct for Outer Space Activities (ICoC) (31 March 2014); www.eeas.europa.eu/non-proliferation-and-disarmament/pdf/space_code_conduct_draft_vers_31-march-2014_en.pdf.
[110] ICoC, Article 1.1.

complementary to the international legal framework regulating outer space activities.[111]

Subscribing States are to "refrain from any action which brings about, directly or indirectly, *damage*, or *destruction*, of space objects unless such action is *justified*" by imperative safety considerations, to reduce debris creation, or right of self-defence.[112] The ICoC does not seek to prohibit the placement of weapons in space, but addresses what has become known as Principles of Responsible Behaviour in Outer Space (PORBOS).[113]

Missile Technology Control Regime and the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies

Arms control regimes like the Missile Technology Control Regime (MTCR) and the Wassenaar Arrangement (WA), essentially aim to prevent the proliferation of weapons and military technology to States lacking their own or the capacity to develop them.

Member States of MTCR adopt export policies in accordance with MTCR Guidelines,[114] providing the overall structure and rules, as well as the list of controlled items, called the "MTCR Equipment, Software and Technology Annex" ("MTCR Annex"). Member States adopt and implement their national export controls of missiles and SLVs[115] to conform to the MTCR rules.

The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies[116] was established in 1996 "to contribute to regional and international security and stability, by promoting transparency and

[111] ICoC, Article 1.3.
[112] ICoC, Article 4.2.
[113] ICoC, Preamble 9. See EU Statement – United Nations 1st Committee: Thematic Discussion on Outer Space (Disarmament Aspects) (17 October 2017), European Union External Action; https://eeas.europa.eu/headquarters/headquarters-homepage/36646/eu-statement-–-united-nations-1st-committee-thematic-discussion-outer-space-disarmament_en (accessed 24 January 2018).
[114] Guidelines for Sensitive Missile Relevant Transfers, MTCR Guideline 8; http://mtcr.info/guidelines-for-sensitive-missile-relevant-transfers/ (accessed 24 January 2018). The relevant equipment, technology and software are defined in the MTCR Annex, last updated on 19 October 2017; http://mtcr.info/mtcr-annex/ (accessed 24 January 2018).
[115] The Missile Technology Control Regime; www.mtcr.info (accessed 24 January 2018). As of October 2017 MTCR had 35 Member Countries.
[116] As of December 2017 the WA had 42 Participating States.

greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilising accumulations."[117]

As with the MTCR, WA Participating States adopt and apply their own national export controls to all items in the List of Dual Use Goods and Munitions List.[118] To assist in developing common understandings of transfer risks, Participating States regularly exchange information of both a general and a specific nature. Participating States are required to report their arms transfers and transfers/denials of certain dual-use goods and technologies to destinations outside the Arrangement on a six-monthly basis. In some cases, shorter reporting time frames apply.[119]

Although both the MTCR and the WA apply to certain space-related technologies, they do not address their placement or use in outer space. There are, however, limitations on the use of other weapons that apply both on Earth and in space, such as blinding lasers. These limitations would apply to use in space by virtue of the Outer Space Treaty.[120]

[117] Guidelines and Procedures, including the Initial Elements, WA-DOC (17) PUB 001; http://www.wassenaar.org/wp-content/uploads/2015/06/WA-DOC-17-PUB-001-Public-Docs-Vol-I-Founding-Documents.pdf (accessed 24 January 2018).

[118] The Lists are updated at the Plenary, the current Lists were revised on 7 December 2017; List of Dual Use Goods and Munitions List (07 December 2017), WA-List (17) 1; http://www.wassenaar.org/wp-content/uploads/2018/01/WA-DOC-17-PUB-006-Public-Docs-Vol.II-2017-List-of-DU-Goods-and-Technologies-and-Munitions-List.pdf (accessed 24 January 2018).

[119] See WA, http://www.wassenaar.org/about-us/ (accessed 24 January 2018).

[120] OST, Article III. See also Sa'id Mosteshar (2008), Outer Space: Arena for War or Peace, *51 Proc. Int'l Inst. Space L.*, AIAA,199.

United Nations General Assembly Resolutions

At its most recent meeting[121] the First Committee (Disarmament and International Security) of the United Nations General Assembly approved six draft resolutions, including one on a legally binding instrument on the prevention of an arms race in outer space.

The Committee approved the draft resolution 'Further practical measures for the prevention of an arms race in outer space,'[122] by a recorded vote of 121 in favour to 5 against (France, Israel, Ukraine, United Kingdom and United States), with 45 abstentions. By the terms of that text, the General Assembly would urge the Conference on Disarmament to agree on a balanced programme of work that included the immediate commencement of negotiations on an international legally binding instrument on the prevention of an arms race in outer space.

The Committee also approved three other draft resolutions related to disarmament aspects of outer space, including one on transparency and confidence-building measures in outer space activities.[123] By a recorded vote of 175 in favour to none against, with 2 abstentions (Israel and United States), it approved the draft resolution "Prevention of an arms race in outer space."[124] By its terms, the Assembly would call upon all States, in particular those with major space capabilities, to refrain from actions contrary to that goal and to contribute actively to the objective of the peaceful use of outer space.[125]

Although encouraging to those advocating weapon-free space, the UN General Assembly has passed resolutions of this kind many times over the years. It remains to be seen whether these will be formalised in binding documents.

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[121] 30 October 2017, GA/DIS/3591; https://www.un.org/press/en/2017/gadis3591.doc.htm (accessed 24 January 2018).

[122] A/C.1/72/L.54 (13 October 2017); https://documents-dds-ny.un.org/doc/UNDOC/LTD/N17/326/74/PDF/N1732674.pdf?OpenElement (accessed 24 January 2018).

[123] A/C.1/72/L.46 (12 October 2017); https://documents-dds-ny.un.org/doc/UNDOC/LTD/N17/325/32/PDF/N1732532.pdf?OpenElement (accessed 24 January 2018).

[124] A/C.1/72/L.3 (12 October 2017); https://documents-dds-ny.un.org/doc/UNDOC/LTD/N17/323/43/PDF/N1732343.pdf?OpenElement (accessed 24 January 2018).

[125] First Committee Submits Six Drafts to General Assembly, One Calling for Immediate Start of Negotiations on Treaty Preventing Outer Space Arms Race (30 October 2017), *Meetings Coverage and Press Release*, United Nations, GA/DIS/3591; https://www.un.org/press/en/2017/gadis3591.doc.htm (accessed 24 January 2018).

Conclusion

With the rapidly growing value of space to States and their citizens, the risk of conflict in outer space will become greater, and with it the possible deployment of space weapons.

As space systems and services become increasingly integrated into the security and daily life of the world population, there is a drive to balance these risks, and to formalise, even if in non-binding instruments, measures for responsible behaviour in outer space.

The various proposals for de-weaponisation of space are evidence of this drive. Although they differ in details, the proposals all aim to foster transparency and confidence building measures and responsible behaviour in outer space.