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Protection for Dual-Use Satellites in International Armed Conflict:
An Assessment of Space Law and International Humanitarian Law

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PROTECTION FOR DUAL-USE SATELLITES IN INTERNATIONAL ARMED CONFLICT: AN ASSESSMENT OF SPACE LAW AND INTERNATIONAL HUMANITARIAN LAW

By Svea Andersson¹

The growing dependency on satellite capacity for the civilian and military spheres, together with a heightened tendency amongst the space-faring actors to develop anti-satellite capacities, calls for a clarification of what rules would govern a situation where a dual-use satellite, providing data for both civilian and military purposes, is being attacked as a method of warfare during international armed conflict. The natural focus for investigation is the frameworks of international humanitarian law and space law. Examining these frameworks, the conclusion is reached that the current frameworks do inhabit restraints on attacking said satellites due to the effects for civilian societies and for the future of space exploration. However, to give the rules meaningful impact, the need for further regulation and clarification is acknowledged.

I. INTRODUCTION

The importance of space and space-based assets has grown to proportions not fathomable at the dawn of the space age – an era beginning with the launch of the first artificial satellite, Sputnik 1, in 1957.² The realm of outer space has since then grown from an area hosting only a handful space-faring states – to one being used by an increasing number of nation states, international intergovernmental organizations and non-state entities, conducting operations of commercial, civil, scientific and military character. Modern societies' reliance on satellites is extensive in various ways; banking, navigation, communication services, global media broadcasting and timing all rely on satellites.³ What is more, there is a growing military dependency on satellites.⁴ The US, Europe, China and Russia identify space as a key component of their respective

¹ Graduate student at the Faculty of Law, Uppsala University 2018. The article is a reworked version of the author's LL.M. thesis with the title *Outer Space as a Theatre of War – Legitimate attacks on dual-use satellites?* written in the spring of 2018. With special thanks to Inger Österdahl for tutoring and encouragement.

² When 'space' or 'outer space' is referred to, I refer to the void in between celestial bodies.

³ Koplow, D., "An Inference About Interference: A Surprising Application of Existing International Law to Inhibit Anti-Satellite Weapons", in *University of Pennsylvania Journal of International Law*, pp. 737–827, vol. 35, 2014, p. 740.

⁴ Boothby, W. H., *The Law of Targeting*, Oxford University Press 2012, p. 359.

military infrastructures and consider space related technology an integral element of their strategic battle platforms.⁵ At the same time, there is a heightened tendency amongst space-faring actors to develop anti-satellite (ASAT) related technologies: including space-based objects that can maneuver and approach targets, as well as advanced ground-based laser systems that can effectively interfere with a satellite's sensors.⁶ Both the US and China relatively recently conducted successful and effective tests of their ASAT capacities, managing to destroy satellites belonging to themselves respectively.⁷

Given the dependency upon satellites along with the development of ASAT weapons the question arises what legal protection satellites would enjoy in the course of an armed conflict.⁸ Even more so, since satellites are often of dual-use, serving both military and civil uses. Evidently, destroying a dual-use satellite would have consequences exceeding that of harming the military of the adversary. A destruction would have consequences for 1) societies reliant upon data supply from the satellite, consequences that could vary from mere inconveniences to severe effects depending on what satellite is being attacked, and further 2) the global community in large, through endangering the space environment and the future of space exploration.

In this article, I will investigate legal restraints to attacking dual-use satellites in international armed conflict. I will assess the legal frameworks of space law, with the Outer Space Treaty (OST) in focus, and international humanitarian law (IHL) to investigate the question whether such acts can legally be conducted within the realm of outer space.

2. LEGAL HISTORIC REVIEW

The successful launch of Sputnik 1 on October 4, 1957 is generally regarded as the landmark for the birth of space law.⁹ The launch meant that the Soviet

5 Freeland, S., "The Laws of War in Outer Space", in *Handbook of Space Security*, pp. 81–112, Schrogl, K.-U., Hays, P., Robinson, J., Moura, D., Giannopapa, C., (eds.), Springer 2015, p. 100; Koplow, D., p. 740.

6 Grego, L., "A History of Anti-Satellite Programs", Union of Concerned Scientists, https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/a-history-of-ASAT-programs_lo-res.pdf, January 2012 (August 20, 2018); Koplow, D., p. 797 f.

7 Ferreira-Snyman, A., "Military Activities in Outer Space", in *Outer Space Law: Legal Policy and Practice*, pp. 95–118, Failat, Y.A., Ferreira-Snyman, A., (eds.), Globe Law and Business Limited 2017, p. 97.

8 Freeland, S., "Applying the Jus in Bello to Military Uses of Outer Space: A Square Peg in a Round Hole?", in *Private Law, Public Law, Metalaw and Public Policy in Space*, pp. 109–122, Sterns, P.S., Tennen, L., (eds.), Springer International Publishing 2016, p. 109.

9 Andoni, D., *The Ultimate Space Law Collection*, vol. 1, Wolf Legal Publishers 2013, p. 3.

Union launched a satellite into an orbit that passed above the air space of other nation states, without permission.¹⁰ President Eisenhower tactically accepted the Soviet Union overflight – knowing that the US would eventually be interested in overflying Soviet territory with its own satellite capacity.¹¹ Through this decision of passivity, it was established that the rules governing spacecraft would differ from those governing aircraft, and that a nation's sovereignty does not extend vertically into space. With these rules established, through the lack of protests from other states – space law was born.¹²

The urge to regulate human space activity was realized soon enough. In 1959 the UN established a Committee on the Peaceful Uses of Outer Space (COPUOS) through Resolution 1472 (XIV) with the task to govern the exploration and use of space for the benefit of all humanity – for peace, security and development.¹³ During a period stretching from late 1960's to late 1970's the international community, through COPUOS, managed to draft five international treaties regulating space activity. Up to this date, these treaties make up the core of the international law regulating space.¹⁴ Many aspects of space use and exploration are indeed regulated through the treaties: astronaut activity, international responsibility for damage caused by space objects, registration of space objects, and conducts related to the Moon and other celestial bodies.¹⁵ With the entering into force of the OST a few general rules were also presented with reference to weapons and military uses – although marked by political caution, vagueness and compromise.

This vagueness however, was not a product of the international community's ignorance or lack of commitment. On the contrary, there have been several attempts with varying levels of success to address the lack of guiding rules, and consequently to prohibit a misuse of said legal lacuna. Issues of disarmament and military uses of space were driving forces in the very first efforts to regulate

10 Ibid.

11 Ibid.

12 Ibid.

13 International Co-operation in the Peaceful Uses of Outer Space, UNGA RES 1472 (XIV), 18 December 1959.

14 The term 'space law' embodies both international and national rules governing the activities in outer space, of which this article solely covers the former.

15 See Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, UNTS, vol. 672, p. 119, 22 April 1968; Convention on International Liability for Damage Caused by Space Objects, UNTS, vol. 961, p. 187, 29 March 1972; Convention on Registration of Objects Launched into Outer Space, UNTS, vol. 1023, p. 15, 14 January 1975; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, UNTS, vol. 1363, p. 3, 18 December 1979.

space, fed by the incentive not to bring current tensions on Earth into space.¹⁶ The central point to be made is that the shortage of regulation of hostile action has not yet been solved since the initiatives have thus far proven unsuccessful, are not in force or fail to address other weapons than nuclear weapons and weapons of mass destruction (WMD). As of today, the general rules of OST make up the available guidance in space law on how to assess a situation where an armed conflict involves the targeting of satellites.

IHL provides the framework governing the conduct in armed conflict regarding ground, sea, and air-based warfare. It is not given how the rules apply when a party to a conflict – be it air, sea or ground-based – uses force in space. Seemingly, there are robust frameworks regulating space and international armed conflict respectively, although the specific question of targeting satellites seems to fall in a legal lacuna between the two.

3. CERTAIN CONCEPTS

3.1 DUAL-USE SATELLITES

Dual-use satellites are satellites that are employed for gathering and distributing data for both military and civil or commercial purposes, and are common amongst satellites for monitoring, communication and navigation.¹⁷ The US Global Positioning System (GPS), or almost any other Global Navigation Satellite System (GNSS), can exemplify this common phenomenon.¹⁸ The US government originally developed the GPS for military purposes, such as target tracking, navigation, reconnaissance as well as missile and projectile guidance. Over time, the GPS satellite system, consisting of 31 satellites, has grown to serve also fundamental civilian uses.¹⁹ To mention a fraction of the daily uses of GPS – communications, banking, navigation, location and emergency services all depend on GPS for location and timing capabilities.²⁰ The GPS satellites have been almost irreversibly tied to the smooth running of international operations.

16 Arons, D. M., Dembling, P. G., “The Evolution of the Outer Space Treaty”, in *Journal of Air Law and Commerce*, pp. 419–456, vol. 33, 1967, p. 427.

17 Scheffran, J., “Peaceful and Sustainable Use of Space – Principles and Criteria for Evaluation”, in *Space Use and Ethics*, pp. 49–80, Bender, W., Hagen, R., Kalinowski, M., Scheffran, J., (eds.), Agenda-Verlag 2001, p. 60.

18 Larsen, P., “Issues relating to civilian and military dual uses of GNSS”, in *Space Policy*, pp. 111–119, vol. 17, Elsevier Science Ltd. 2001, p. 111.

19 Another GNSS is the European GALILEO that, as opposed to the GPS, was developed foremost to secure civil services and avoid dependency upon a military system.

20 Lee, R. J., Steele, S. L., “Military Use of Satellite Communications, Remote Sensing, and Global Positioning Systems in the War on Terror”, in *Journal of Air Law and Commerce*, pp. 69–112, vol. 79, 2014, p. 71.

3.2 ASAT WEAPONS AND PROLIFERATION OF SPACE DEBRIS

Destroying a satellite inevitably creates debris, which indiscriminately spreads in Earth orbit.²¹ There is no generally accepted definition of space debris, although the Space Debris Mitigation Guidelines created by the COPUOS, and endorsed by the UN General Assembly (UNGA) in Resolution 62/217, defines space debris as “all man-made objects, including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional”.²² Detritus from earlier launches, dysfunctional satellites, expended rocket bodies, and pieces of paint are all examples of space debris.

As of today, more than 500,000 pieces of debris ranging in size from coins to minivans are being effectively tracked in Earth orbit.²³ This is just a fraction of all the debris – millions of smaller, non-traceable pieces and shrapnel inhabit Earth orbit, with the capacity to endanger the life of a satellite in a collision.²⁴ Debris can move at relative impact velocities higher than 35,400 kilometers per hour.²⁵ Anything traveling at this velocity can inflict calamitous harm to a spacecraft in the case of a direct hit.²⁶ The already critical, difficult and expensive activity of exploring space is becoming even more so with the creation of more debris.²⁷

There have been surprisingly few collisions with disastrous effects. However, there are examples. In 1996, a French military satellite was hit and set off course by debris from a French rocket stage that exploded a decade earlier, and in 2009 an old Russian satellite hit and destroyed a functioning US satellite, turning both satellites into immense debris clouds.²⁸ The latter collision, in

21 Removal of abandoned material that already pollutes the space environment is not yet at a conceptual stage.

22 United Nations Office for Outer Space Affairs, *Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space*, ST/SPACE/49, Vienna 2010, p. 1; United Nations General Assembly, *International Cooperation in the Peaceful Uses of Outer Space*, A/RES/62/217, 22 December 2007, p. 26.

23 Johnson-Freese, J., “Build on the Outer Space Treaty”, *Nature International Weekly Journal of Science*, nature.com, <https://www.nature.com/news/build-on-the-outer-space-treaty-1.22789>, 9 October 2017 (15 September 2018).

24 Ibid.

25 Anzaldua, A., Dunlop, D., “Overcoming non-technical challenges to cleaning up orbital debris”, in *The Space Review*, <http://www.thespacereview.com/article/2863/1>, 9 November 2015 (13 September 2018).

26 Koplów, D., p. 750 f.

27 Johnson-Freese, J., 2017.

28 Garcia, M., (ed.), “Space Debris and Human Spacecraft”, NASA, https://www.nasa.gov/mission_pages/station/news/orbital_debris.html, 27 September 2013 (12 September 2018); Koplów, D., p. 752.

turn, created over 2000 pieces of traceable space debris.²⁹ In March 2011 the International Space Station (ISS) was forced to initiate evasive maneuvers to avoid collision with debris from the collision between the US and Russian satellites in 2009.³⁰

ASAT weapons are naturally weapons hitting targets in space – satellites. There are various kinds of ASAT weapons, such as directed energy systems that execute cyber attacks or blind a satellite's sensors, and also a range of kinetic energy interceptors with a nature to fracture the target.³¹ In this article I maintain a general assessment of space or ground-based kinetic ASAT weapons with the common denominator in the ability to fracture a target satellite with precision. The reason for this focus is the timeliness with the US and Chinese tests, and the immense consequences of employing ASAT capacity of this kind, in contributing to an uncontrollable proliferation of space debris in the finite resource that Earth's orbital space environment constitutes.³²

There is no international legal instrument presently in force that specifically regulates the testing, deployment and use of ASAT weapons in space.³³ However, Lee and Steele argue that said actions do not exist in a legal vacuum – and hold that it is Article IV and IX of the OST that centrally need to be analyzed and considered.³⁴

4. LEGAL RESTRAINTS IN THE OUTER SPACE TREATY

The OST, preceded by a number of UNGA resolutions and years of discussion within the COPUOS, entered into force in 1967.³⁵ The OST was the first international treaty governing the use of outer space and codified some of the early developed principles: that space exploration and use shall be carried out for the benefit and in the interest of all states (Article I), that international law including the UN Charter shall be adhered to (Article III), that outer space

29 Garcia, M., 2013.

30 Koplow, D., p. 755.

31 Ibid., p. 796.

32 Guidelines for the Long-term Sustainability of Outer Space Activities, COPUOS, A/AC.105/2017/CRP.26, 14 June 2017, p. 12.

33 However, the UNIDIR in 2018 presented a set of ASAT test guidelines to enhance stability in outer space and limit potential dangers of its weaponization, <http://unidir.org/files/publications/pdfs/-en-703.pdf> (17 September 2018).

34 Lee, R. J., Steele, S. L., p. 106.

35 See e.g. UNGA RES 1884 (XVIII), Question of General and Complete Disarmament, 17 October 1963; RES 1472 (XIV), International Co-operation in the Peaceful Uses of Outer Space, 12 December 1959; RES 1721 (XVI), International Co-operation in the Peaceful Uses of Outer Space, 20 December 1961.

shall be used for peaceful purposes (Article IV), and that the states parties to the treaty shall be guided by the principle of co-operation and mutual assistance, and as far as possible avoid potentially harmful interference with the activities of other states (Article IX).³⁶ Today as many as 105 countries are parties to the treaty, while another 26 are signatories but have yet to ratify it.³⁷

4.1 ARTICLE I – A PROVINCE OF ALL MANKIND

The first paragraph reads:

The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

In the decision to attack a satellite, it has to be considered that the consequences of an attack do not occur in a limited territory, but will affect the *province of all mankind*. It is a peculiar situation, and possibly one that could be compared to that of international armed conflicts on the high seas. The high seas are also a global common and bear the same status as *territorium extra commercium* – areas not subject to the terrestrial sovereignty of any state.³⁸ The high seas make out a possible area of naval warfare according to the San Remo Manual.³⁹ Hence, the fact that the outer space is a province of all mankind would seemingly not, in itself, restrict states from conducting armed conflict in the realm. On the one hand, it seems implausible to argue that conducting war operations in space, such as attacking satellites, would be prohibited merely based on this provision. More than that, I argue that the character of being a province of all mankind rather offers states to use, or possibly misuse, the area on the terms set by the international community. On the other hand, it could be argued that it would be immoral to conduct an attack in this realm based on this status, although not illegal solely based on Article I. The second paragraph of the article reads:

36 Freeland, S., 2015, p. 88.

37 “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies”, United Nations Office for Disarmament Affairs (UNODA), disarmament.un.org, http://disarmament.un.org/treaties/t/outer_space/signature/desc (20 September 2018).

38 Cheng, B., *Studies in International Space Law*, Clarendon Press 1997, p. 525; *Convention on the High Seas*, UNTS, vol. 450, p. 11, Geneva 29 April 1958, Article 2.

39 Doswald-Beck, L., (ed.), *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, Cambridge University Press 1995, Rule 10b.

Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

The paragraph further highlights the freedom of exploration and use by all states.⁴⁰ It could be argued that the consequences of an attack would affect the freedom to explore or use space, since the creation of debris would enhance the risks associated with space activity. I argue that a conclusion on this basis would be too far-fetched because of two reasons. Firstly, the provision is formulated as a freedom, not a privilege granted by the legal system. According to my interpretation, the right that stems from the freedom lies rather in the right not to be discriminated than to be able to enjoy the freedom to explore on the same terms as other states. Secondly, the proliferation of debris would not affect states in a discriminatory manner. To conclude, Article I seemingly puts forward moral considerations for states and emphasizes the principal themes of the treaty, albeit offering no direct legal restrictions for hostile actions towards satellites in armed conflict.

4.2 ARTICLE III – IN ACCORDANCE WITH INTERNATIONAL LAW

Article III reads:

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 co-operation and understanding.

The article provides a rule central to the understanding of what rules govern human space activity, and reaffirms that international law is applicable and shall be adhered to also in activities conducted beyond the atmosphere.⁴¹ The article does not clarify if international law and the UN Charter apply *in toto*. According to Ribberlink there is a general consensus that *relevant rules* of international law apply to international relations *wherever* such relations take place.⁴² According to my interpretation of the provision, reasonably international law applies in space to the extent it is

40 Cheng, B., p. 236.

41 Cheng, B., p. 524 f.

42 Ribberlink, O., "Article III", in Cologne Commentary on Space Law, pp. 271–284, Hobe, S., Schmidt-Tedd, B., Schrogl, K.-U., (eds.), Berliner Wissenschafts-Verlag GmbH 2017, p. 273.

practically convenient, and to an extent that does not make the application subject to logical disruption. To support my view that not all law applies, it can be reminded that international law holds rules regulating sovereignty and other issues naturally not applicable in space, e.g. rules regulating terrestrial waters.

One of the reasons proclaimed for why international law and the UN Charter shall be adhered to is stated to be in the interest of maintaining international peace and security, and promoting international co-operation and understanding.⁴³ The phrasing mirrors the purposes put forward in Article I of the UN Charter: to maintain international peace and security, to develop friendly relations amongst nations and to achieve international co-operation.⁴⁴ Possibly the specific mention of the motive to maintain international peace and security can support an argument that attacks on satellites should be avoided, since they could further jeopardize this motive. Attacking a dual-use satellite is a great assault, which could lead to counterattacks from the attacked part, or possibly dissatisfaction by states or co-owners of the attacked satellite not part to the original conflict. The argument should according to my understanding be given substantial attention since an attack on a satellite could have effects, destabilizing the international peace and security, and raising political grudge far beyond the situation of the original conflict.

4.3 ARTICLE IV – WEAPONIZATION AND PEACEFUL PURPOSES

Military uses or the introduction of weapons into the outer space environment are not explicitly fully prohibited either in space law or international law, and only the Moon and other celestial bodies are demilitarized.⁴⁵ Article IV of the OST is one of the few places in the space treaties where weaponization of space is regarded, and consequently a central article to consult to answer what restrictions space law might hold to the relevant kind of military use and weaponization.

Paragraph 1 – Partial Deweaponization of Outer Space

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.

⁴³ Outer Space Treaty, Article III.

⁴⁴ Charter of the United Nations, UNTS, vol. I, p. XVI, San Francisco 26 June 1945, Article I.

⁴⁵ Gasparini Alves, P., (ed.), Prevention of an Arms Race in Outer Space: A Guide to the Discussions in the Conference on Disarmament, UNIDIR/91/79, New York 1991, part 1, p. 14; Outer Space Treaty, Article IV; The Moon Agreement, Article 3.3.

The most interesting aspect about the paragraph is its limited scope. The prohibition on introducing weapons into space covers only nuclear weapons and other kinds of WMDs, meaning that weapons other than those are not explicitly prohibited.⁴⁶ The mention of only the aforementioned weapons can partly be understood in the light of the efforts under the heightened political tensions of the Cold War, to agree to certain minimum standards, and to hinder contemporary conflicts extending into the space realm.⁴⁷ It does, according to my understanding, make sense not to prohibit *weapons* in more general terms, realizing firstly that there is no generally accepted definition of the notion of ‘space weapons’, and secondly that all objects with an ability to move in space can potentially cause immense damage due to the high speed at which objects travel.⁴⁸ A wider more general ban would possibly create uncertainty, confusion and require complex delimitations in practice, since most space objects could be regarded as weapons, given the inherent ability to cause immense harm. It is doubtful that this was an underlying concern in the mind of the drafters, although it could be born in mind as to why a stricter ban might be difficult to reach.

Hebert holds that the most commonly accepted definition of WMDs encompasses nuclear, biological and chemical weapons (NBC) and that kinetic ASAT weapons generally fall outside the scope of any such definition.⁴⁹ However, there is no treaty law or customary international law that contains an authoritative definition of a WMD.⁵⁰ If accepting that kinetic ASAT weapons are commonly not considered WMDs, they do fall outside the scope of the prohibition of Article IV.1.⁵¹ Another notable aspect of the paragraph is the wording of *placed in orbit*, *install* and *station*. The phrasing suggests that mere *presence*, *use*, or *sending into space* of nuclear

46 Gorove, S., “Arms Control Provisions in the Outer Space Treaty: A Scrutinizing Reappraisal”, in *Georgia Journal of International and Comparative Law*, pp. 114–123, vol. 3, 1973, p. 115.

47 Johnson, C. D., “The Outer Space Treaty”, in *Oxford Research Encyclopedia of Planetary Science*, <http://planetaryscience.oxfordre.com/view/10.1093/acrefore/9780190647926.001.0001/acrefore-9780190647926-e-43?print=pdf>, January 2018 (24 October 2018), p. 1.

48 In 1991 UNIDIR proposed a definition, however, this definition has not reached a status as generally accepted. For the definition see Gasparini Alves, P., p. 18.

49 Hebert, K., “Regulation of Space Weapons: Ensuring Stability and Continued Use of Outer Space”, in *Astropolitics*, pp. 1–26, vol. 12, Taylor & Francis Group 2014, p. 7.

50 Fidler, D., “Weapons of Mass Destruction and International Law”, in *American Society of International Law*, *asil.org*, vol. 8, <https://www.asil.org/insights/volume/8/issue/3/weapons-mass-destruction-and-international-law>, 11 February 2003 (22 September 2018).

51 Schrogl, K.-U., Neumann, J., “Article IV”, in *Cologne Commentary on Space Law*, pp. 285–349, Hobe, S., Schmidt-Tedd, B., Schrogl, K.-U., (eds.), *Berliner Wissenschafts-Verlag GmbH* 2017, p. 308.

weapons or WMDs is possibly not prohibited. Gorove too, is concerned with the phrasing and holds that there should at least be some thresholds to the criteria and proposes that a mere presence of a WMD without being installed would not be prohibited.⁵²

As a side notice, I argue that ASAT weapons might possibly be classified as WMDs. Kinetic ASAT weapons can target with precision, as mentioned in section 3.2 and proven by the ASAT tests of China and the US. However, they do cause risk of random large-scale destruction, if creating debris clouds large enough to indiscriminately collide with other satellites – including possible chain reactions – as well as impede future space exploration and use. Furthermore, the unpredictable effects to the ground users of the satellite data could be potentially devastating. However, if the conclusion is correct that the phrasing of the paragraph provides that there is no prohibition on *sending* WMDs to space, it could be discussed if a classification as a WMD would still not make the employment of a kinetic ASAT weapon illegal. I will not linger on the issue, but instead conclude that the current legal reality is, based on the phrasing of the provision and on common opinion, that kinetic ASAT weapons are not per se forbidden to employ in outer space based on Article IV.1.

Paragraph 2 – Peaceful Purposes

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.

At first glance, the provision seemingly protects outer space from becoming a theatre of war and, by extension, satellites from being targeted. However, attention must be directed at the wording, declaring that *the Moon and other celestial bodies shall be used exclusively for peaceful purposes*.⁵³ As a reference, the otherwise frequent phrasing in the OST of *outer space, including the Moon and celestial bodies*, is not the expression of choice.⁵⁴ Hence, *outer space* is left

⁵² Gorove, S., p. 117.

⁵³ Outer Space Treaty, Article IV.

⁵⁴ Compare e.g. Articles I, II, III, VI, VII, IX.

out of the domain confined to peaceful purposes only.⁵⁵ The deviant phrasing allows for an argument that the decision to exclude outer space was a deliberate decision by the drafters. Though, the reasons for this decision are not clear. Possibly the decision is a result of political considerations and compromise. Just as Antarctica was being demilitarized under the Antarctic Treaty of 1959 there was a strong opinion on the part of some delegates during the drafting of the OST that the whole of outer space, including the celestial bodies, should be completely demilitarized.⁵⁶ Both the US and the Soviet Union made it clear though that any attempt of total demilitarization would make the treaty unacceptable to them.⁵⁷ This could possibly be understood in the light of the ongoing Cold War and the already prominent value of space technologies for the respective militaries.⁵⁸

The idea of an area governed under peaceful purposes also appears in the preamble to the OST as well as in the preambles to the Rescue Agreement, the Liability Convention and the Registration Convention. The appearance of the theme shows the drafters' intent to emphasize the interest. Whilst preambles to treaties are setting moral and political obligations, they do not hold the same legal weight as treaty articles. Though, Article 31.2 of the Vienna Convention on the Law of Treaties (VCLT) provides that preambles are part of the text, and hence are to be regarded in a textual approach to the interpretation of treaties.⁵⁹ This position provides some extent of legal bearing to preambles, according to my interpretation. At the least, when interpretation of a provision is needed, the interpretation must be conducted in the light of the preambles. Reading Article IV in the light of the interest of space being governed under peaceful purposes does not alter the clear dissenting choice of phrasing. Thus, the impact of these morals on the restriction of military targeting in outer space is seemingly frail.

4.4 ARTICLE IX – HARMFUL INTERFERENCE

One provision of the long article is to be presented, that is of certain interest to investigate, as it presents the obligation to not engage in activities that would cause potentially harmful interference with activities of other States Parties:

55 Cheng, B., p. 517.

56 Tannenwald, N., "Law Versus Power on the High Frontier: The Case for a Rule-Based Regime for Outer Space", in *Yale Journal of International Law*, pp. 363–422, vol. 29, 2004, p. 379; *The Antarctic Treaty*, UNTS, vol. 401, p. 71, Washington 1 December 1959, Article 1.

57 Cheng, B., p. 411.

58 Schrogl, K.-U., Neumann, J., p. 294.

59 Vienna Convention on the Law of Treaties, UNTS, vol. 1155, p. 331, 23 May 1969, Article 31.

If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment.

Article IX can be seen as if it dovetails with Article I of the OST in further stressing the freedom to use and explore space, through setting some restraints to actions that could hamper that freedom. If a state has reason to believe that an activity could cause potentially harmful interference with the activities of other states it shall undertake consultations before proceeding with such activity. Without further assessing the meaning of ‘reason to believe’ it can be concluded, given the low threshold in the wording of ‘potentially harmful’, that it must be obvious, beyond reason to believe, that destroying a satellite could cause potentially harmful interference with activities of other states. A potentially harmful interference must always be comprehended, given that it is known that space debris indiscriminately could collide with other satellites or space objects. Hence, international consultation shall be turned to before proceeding with an attack.

There have indeed been kinetic ASAT tests in peacetime that have contributed to large debris clouds that could cause potentially harmful interference in the risk of collision for other satellites in similar orbits. It is interesting to note that these activities, creating an equivalent potentially harmful interference, have not given rise to notable grudge in the international community. The Chinese test was, for instance, greeted by an international critical reaction from governments, NGOs and the media.⁶⁰ However, the response did not get worse than critical comments.⁶¹ Japan was the only state that complained that China should have given advance notice, and suggesting that the test would not be “in compliance with basic international rules, such as the Outer Space Treaty”, likely intending Article IX of the OST.⁶² Furthermore there were no invocations of the article during the Cold War era when both the US and the Soviet Union conducted ASAT tests, without previous consultation.⁶³ The absence

60 Neuneck, G., “China’s ASAT Test – A Warning Shot or the Beginning of an Arms Race in Space?”, in *Yearbook on Space Policy 2006/2007*, pp. 225–238, European Space Policy Institute, Schrogl, K.-U., (ed.), Springer Verlag 2008, p. 214.

61 *Ibid.*, p. 215.

62 *Ibid.*

63 Listner, M. J., “The Account of Norad 40258 and U.S. Options Under Article IX”, *Space*

of protest amongst the nation states might possibly indicate an approach that the effects are not considered to be potentially harmful in the first place. If so, an international custom of this approach might develop over time, if it cannot be said to have already formed, on the two central elements of customary law: the practice of states, and *opinio juris*.⁶⁴ Possibly the passivity to protest stems from acknowledging that demanding another state to consult prior to specific actions would put themselves under the obligation to expose national security activities in space and further, a need to consult would hamper the effects of a potential attack. The development can be compared to how the very first space laws arose – through inaction of states to protest, considering their own future interests.⁶⁵ Said inaction could potentially be dangerous in watering down the provision otherwise causing legal challenges to attacking dual-use satellites.

5. LEGAL RESTRAINTS IN INTERNATIONAL HUMANITARIAN LAW

The balancing in IHL of military and humanitarian considerations, together with its rules for the protection of civilian societies and weapon restrictions, offers guidance regarding legality and legitimacy of targeting dual-use satellites. Principles of particular relevance are the following two. 1) The principle of distinction, due to the character of the satellites as both military and civil, and the indistinct indirect consequences that result from an attack. 2) The principle of proportionality, since the consequences might be severe: e.g. the harm for possible co-owners of the satellite, for the end users of satellite dependent devices, or enhanced risks associated with space activity through the spread of debris. Before assessing these rules, the applicability of the IHL framework shall be decided.

5.1 APPLICABILITY OF IHL IN SPACE

Tronchetti argues that the applicability of IHL in space should not be questioned even though the rules were not specifically developed to govern the use of force in the space realm.⁶⁶ Notwithstanding the lack of a specific notion of space in the central instruments, it is my understanding too that the general corpus of IHL must apply to outer space. Article I common to the 1949 Geneva Conventions holds that “The High Contracting Parties undertake to respect and to ensure respect for the present Convention in

Thoughts Law and Policy Thoughts on Issues Surrounding The Final Frontier, <https://spacethoughtsblog.wordpress.com/2015/10/10/the-account-of-norad-40258-and-u-s-options-under-article-ix>, 10 October 2015 (18 September 2018).

64 Nyman Metcalf, K., *Activities in Space – Appropriation or Use?*, *Iustus* 1999, p. 82.

65 See above section 2.

66 Tronchetti, F., “Legal Aspects of the Military Uses of Outer Space”, in *Handbook of Space Law*, pp. 331–381, von der Dunk, F., (eds.), Edward Elgar Publishing Limited 2015, p. 358.

all circumstances”.⁶⁷ Furthermore, in the Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons, the ICJ held that IHL applies “to *all* forms of warfare and to *all* kinds of weapons, those of the past, those of the present and those of the future”.⁶⁸ This application together with the Common Article I of the Geneva Conventions supports a wide applicability of the legal framework. They indicate an attempt to emphasize the interest to ensure humanitarian protection, and doing so through also encompassing situations not foreseeable at the time.

The modern treaty law regulating attacks is set out in Articles 48–67 of the 1977 General Protocol I (AP1), to the 1949 Geneva Conventions, which makes the instrument central for the current assessment.⁶⁹ Besides the presumably general application of AP1 in space, there is one limitation worth discussing. Article 49 of the AP1, which defines an attack as means of violence against an adversary whether in offence or defense, further states that the provisions of the section, that is Articles 48–67, apply to “any land, air or sea warfare, which may affect the civilian population, individual civilians or civilian objects on land. They further apply to all attacks from sea or from the air against objectives on land but do not otherwise affect the rules of international law applicable in armed conflict at sea or in the air”.⁷⁰ Space is not mentioned in the enumeration, making the applicability of the relevant rules dubious. However, I argue that when the armed conflict occurs between states in land, air or sea combat, with an attack directed at a target in space, the anticipated military effect and objective is on the ground battlefield. To support my argument, the provision aims to encompass situations where the civilian population, individual civilians or civilian objects on land may be affected. An attack on a dual-use satellite would affect the civilian population on land and hence an inclusion in the provision would be motivated. Yet, if a thorough review would prove non-applicability in space, most rules in the section make out international customary rules, giving the humanitarian considerations impact that way.

67 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, UNTS, vol. 75, p. 31; Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, UNTS, vol. 75, p. 85; Geneva Convention Relative to the Treatment of Prisoners of War, UNTS, vol. 75, p. 135; Geneva Convention Relative to the Protection of Civilian Persons in Times of War, UNTS, vol. 75, p. 287, 12 August 1959; emphasis added.

68 Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, ICJ Reports 1996, p. 226, 8 July 1996, § 86; emphasis added.

69 Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (AP1), UNTS, vol. 1125, p. 3, 8 June 1977.

70 AP1, Article 49.3.

5.2 DISTINCTION

5.2.1 DUAL-USE OBJECTS

Parties to a conflict must at all times distinguish between the civilian population and combatants, and between civilian objects and military objectives.⁷¹ Consequently, a belligerent party must do everything feasible to verify that targets are military objectives before directing attacks towards them.⁷² The principle is a customary rule of international law that according to the ICJ is a cardinal principle, which constitutes the fabric of humanitarian law.⁷³ The dual-use of a satellite does not per se hinder it from being a military objective.⁷⁴ The assessment of satellites as legitimate military targets rather comes down to the fulfillment of the criteria laid down in Article 52.2 of AP1. Article 52.2 presents what characteristics serve to identify a military objective, and holds that, regarding objects, military objectives are limited to those objects

which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage.⁷⁵

Civilian objects are negatively defined in Article 52.1 AP1 as all objects that are not military objectives. The definition of an object constituting a military objective comprises two cumulative elements: 1) the nature, location, purpose or use which makes an effective contribution to military action, and 2) the total or partial destruction, capture or neutralization which in the circumstances ruling at the time offers a definite military advantage. Neither the AP1 nor the Geneva Conventions of 1949 provides guidance to the criteria of 'effective contribution' or 'definite military advantage'.⁷⁶ However, there is limited guidance to be found by consulting the ICRC and by conducting a case study of the International Criminal Tribunal for the Former Yugoslavia (ICTY) assessment of a NATO bombing of the Serbian Television and Radio Station (RTS).⁷⁷

71 AP1, Article 48.

72 ICRC Study, rule 16, p. 55; AP1 Article 57.2a.

73 Legality of the Threat or Use of Nuclear Weapons, § 78, p. 257.

74 Dinstein, Y., *The Conduct of Hostilities Under the Law of International Armed Conflict*, Cambridge University Press 2004, p. 120.

75 AP1, Article 52.2.

76 Dorman, K., "Proportionality and Distinction in the International Criminal Tribunal for the Former Yugoslavia" in *Australian International Law Journal*, pp. 83–98, vol. 12, 2005, p. 88.

77 Turns, D., "Military Objectives", in *Routledge Handbook of the Law of Armed Conflict*, pp. 139–156, Livoja, R., McCormack, T., (eds.), Routledge 2016, p. 151.

Regarding satellites, the characteristic that makes an effective contribution is its use, meaning its present function.⁷⁸ As can be concluded from the wording of Article 52.2, it is not enough that the satellite has the potential to be used for a military purpose – instead it must be actively making an effective contribution to military action. Accordingly, a commander would need intelligence and sufficiently accurate information, on a case-to-case basis before an attack can be launched. Satellites do, as opposed to e.g. a weapon employed in the battlefield, contribute in a less direct manner to the conflict, in that they operate outside of the war zone. Turns argues that a direct causation is not needed, but that legitimate military objectives far from the zone of combat may still be targeted on the basis that their contribution to the military activity is effective, albeit indirect in relation to the specific hostilities.⁷⁹ I argue that the argument is logical since e.g. broadcasting stations, that have been concluded important targets in Article 8 of the Hague Culture Property Convention, might not always be located in the war zone, although nonetheless effectively contribute to the military action.⁸⁰ A better understanding of the two criteria can be provided through assessing how the ICTY regarded the NATO bombing of a Serbian broadcasting site.

5.2.2 THE NATO BOMBING OF A SERBIAN TELEVISION AND RADIO STATION

The RTS was one of NATO's targets, bombed in 1999 during the Kosovo War.⁸¹ The facility was deliberately selected for attack due to its wartime use as a backup command, control and communications network for the Serbian military.⁸² ICTY assessed the attack as justified insofar it was indeed aimed at disrupting the command, control and communications network of the armed forces.⁸³ In addition to this legitimate motive, NATO motivated the attack also by reason that the RTS was part of the propaganda apparatus of the Federal Republic of Yugoslavia (FRY). This motivation was not accepted since it was not regarded as meeting the criteria of effective contribution and since the military advantage offered could not on this ground be considered concrete and direct.⁸⁴

⁷⁸ Turns, D., *Military Objectives*, p. 150.

⁷⁹ *Ibid.*, p. 151.

⁸⁰ Convention for the Protection of Cultural Property in the Event of Armed Conflict, UNTS, vol. 249, p. 215, 14 May 1954, Article 8.

⁸¹ Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia (Final Report to the Prosecutor), International Criminal Tribunal for the Former Yugoslavia (ICTY), 13 June 2013, § 71.

⁸² Turns, D., *Military Objectives*, p. 152.

⁸³ Final Report to the Prosecutor, § 75; Oeter, S., "Methods and Means of Combat", in *The Handbook of International Humanitarian Law*, pp. 115–230, Fleck, D., (ed.), 3rd ed., Oxford University Press 2013, p. 173.

⁸⁴ Final Report to the Prosecutor, §§ 75, 76.

Disrupting the command, control and communication facilities of the adversary is seemingly a strong indicator of a definite military advantage. In similarity with attacking a broadcasting station, attacking a satellite would affect the command, control and communications infrastructure through eliminating a central component of it. A case-to-case determination must be made as to whether a definite military advantage would be obtained by attacking a dual-use object.⁸⁵ However, it can be argued that a dual-use satellite that is making effective contribution to the belligerent through e.g. communication or navigation services would in general fulfill the criteria of being a military objective since the destruction of said satellite would, by strong indication of the ICTY opinion, offer a definite military advantage. To conclude, dual-use satellites might well fulfill the criteria of being military objectives.

5.2.3 INDISCRIMINATE ATTACKS

Another relevant aspect of the principle of distinction is the prohibition of attacks that employ methods or means of combat, the effects of which cannot be limited as required by IHL.⁸⁶ The rule stems from the general principle that the rights of parties to a conflict to choose methods and means is not unlimited, as laid down in Article 22 of the 1907 Hague Regulations and later also in Article 35.1 of the AP1.⁸⁷ The prohibition of indiscriminate attacks is a customary rule of international law also set forth in Article 51.4 of the AP1.⁸⁸ Indiscriminate attacks are those

- (a) which are not directed at a specific military objective;
- (b) which employ a method or means of combat which cannot be directed at a specific military objective; or
- (c) which employ a method or means of combat the effects of which cannot be limited as required by international humanitarian law; and consequently, in each such case, are of a nature to strike military objectives and civilians or civilian objects without distinction.

It has been concluded that dual-use satellites can be military objectives per se. Given this background, an attack directed in accordance with Article 52.2 should not be considered indiscriminate on the basis of sub-paragraph (a). The two remaining criteria are related to the means and methods that

85 Turns, D., "The Law of Armed Conflict (International Humanitarian Law)", in *International Law*, pp. 831–851, Evans, M. D., (ed.), 4th ed., Oxford University Press 2014, p. 837.

86 AP1, Article 51.4c.

87 Hague Convention (IV), Respecting the Laws and Customs of War on Land and its annex: Regulations Concerning the Laws and Customs of War on Land, 18 October 1907, Article 22.

88 ICRC Study, rule 12, p. 40.

can be employed in warfare. With regards to the criteria (b), the attractive characteristic of kinetic ASAT weapons is that they, as proven by both the US and China, have the ability to effectively target an objective with precision.⁸⁹ As long as an ASAT weapon with this capability is used, the attack should not be deemed indiscriminate on the basis of sub-paragraph (b). Sub-paragraph (c) requires a choice of methods and means of warfare of which the effects can be limited. For the attack to be considered indiscriminate it further needs to be of a nature to strike military objectives and civilians or civilian objects without distinction. The sub-paragraph concerns weapons, the effects of which cannot under any circumstances be limited, as opposed to e.g. means of fire or water which, depending on their use, can either have a restricted effect or be out of control of the user.⁹⁰ Examples of such weapons are bacteriological or nuclear weapons.⁹¹ Assessing the possibility to control and limit the effects of the use of an ASAT weapon, it can be concluded that there is not any way in which an ASAT of the kind assessed in this article, can be used to control the damages they inherently cause. It is instead in the nature of the weapon that the effects escape from the control of the launcher and might strike both military and civilian objects and also create risk of excessive civilian damages and harm. Thus, an attack by means of a kinetic ASAT weapon is inherently indiscriminate. Consequently, the use in the course of armed conflict of ASAT weapons that destroy transponders providing data for civilian purposes, and that are likely to cause debris clouds in orbits where civilian satellites might be expected or known to exist, could not legally be employed.

5.3 PROPORTIONALITY AND COLLATERAL DAMAGE

International law recognizes the permissibility of civilian casualties or damage to civilian objects during an attack on a military objective according to the doctrine of collateral damages. Such damage or casualties are proportionate if not excessive, and could have been expected to be excessive, in relation to the concrete and direct military advantage anticipated from the attack.⁹² In the case of dual-use satellites there are two aspects to the proportionality assessment that need to factor against the military advantage anticipated. Firstly, the consequence for civilian societies since, depending on what service a satellite is providing for, the consequences can be immense. Secondly, the risk created for other satellites, and the future of space exploration in large, through the creation of debris.⁹³

89 See section I.

90 ICRC Commentary, comment § 1963 to Article 51 of the API.

91 ICRC Commentary, comment § 1965 to Article 51 of the API.

92 API, Article 57.2; Dorman, K., p. 93.

93 Dinstein, Y., p. 124.

5.3.1 MILITARY ADVANTAGES OF SUCCESSFULLY ATTACKING A SATELLITE

The decision to launch an attack must concern itself with the *anticipated* military advantage, in relation to the civilian damage and injury that *may be expected*.⁹⁴ The view is expressed in a series of declarations made by contracting parties to the API, that an evaluation of military advantage is to be made on the basis of the advantage anticipated from the attack considered as a whole and not from isolated or specific parts of the attack.⁹⁵ The military advantage must be concrete and direct, and moreover the ICRC proposes that a military advantage can only consist in ground gained and in annihilating or weakening the enemy armed forces.⁹⁶ Supposedly, evaluating the advantage of an attack upon a dual-use satellite would mean assessing what importance obstructing the data supply for the adversary has for enabling a defeat or weakening of the adversary forces. According to my interpretation, the military advantage must be anticipated to be of less significance if it can be supposed that signals could without difficulty be redirected through other satellites. The belligerent forces would supposedly not be weakened to an extent justifiable in relation to the effects to civilian societies and the space environment.

A few examples will be given of military uses and reliance on satellite systems to illustrate how attacking a satellite might offer military advantage. In the War in Afghanistan, the Northern Alliance forces made use of GPS trackers for position data, laser designators, satellite communications gear that allowed the ground forces to communicate directly to pilots overhead, and laptops on which they could download satellite imagery over the area to know their precise location.⁹⁷ These force enhancement capabilities enabled the military to accurately identify the locations of targets from a safe distance; transmitting the target coordinates via satellite phones or laptops to warplanes circling overhead.⁹⁸ As exemplified, the range of uses is broad and inclusive. Also military vulnerability to failure or disturbance of said systems shall be illustrated. In January 2010 an upgrade to the ground segment software of the GPS system left military and timing receivers non-operational for days.⁹⁹ As many as 100,000 US military receivers on weapons, jet flights, ground forces and naval vessels were affected.¹⁰⁰ It is evident that disturbances may cause paralyzing

94 API, Article 57.2a, 51.5b.

95 ICRC Study, comment to rule 14, p. 49.

96 ICRC Commentary, comment § 2218 to Article 57 of the API.

97 Lee, R. J., Steele, S. L., p. 71.

98 Ibid.

99 "Global Navigation Space Systems: reliance and vulnerabilities", The Royal Academy of Engineering, <https://www.raeng.org.uk/publications/reports/global-navigation-space-systems>, March 2011 (2 September 2018), p. 17.

100 Lee, R. J., Steele, S. L., p. 84.

effects or severe disruption at the heart of the communication and command structure in the military operations. This debilitation could according to my understanding provide the attacking belligerent a definite military advantage in allowing for the attacking party to overpower the adversary and undermining the enemy's capacity to fully use military communications and assets that need GPS services for their functioning. The advantage anticipated will be decided by what back-up systems the adversary can be expected to have access to, the durability of the disruption expected, as well as the importance of the data for the adversary at the time.

5.3.2 COLLATERAL DAMAGE

As opposed to consequences of e.g. a shooting on the ground, attacking a satellite might affect entire societal systems, thus being more widespread. According to the ICRC Challenges Report and the Tallinn Manual 2.0, indirect effects must factor into the collateral damages.¹⁰¹ An example is incidental damage to hospitals, which is likely to cause disruption of medical devices, which in turn is likely to lead to the death of patients, or long-term consequences, e.g. the long-term consequences of damaged essential civilian infrastructure.¹⁰² Damages resulting from dual-use satellite attacks would fall under this category, since it is not the direct hit of the satellite that creates the harm but rather what follows. The consequences can be formulated as disabling data provision to the ground receiver, which in turn would cause the device or service to malfunction, which could lead to a variety of consequences depending on what service is provided for, and further creating debris which entails a risk for other satellites as well as a risk for chain reactions that in the long run could affect the conditions for future space exploration.

In the ICTY Galic case, the Trial Chamber stated that in determining whether an attack is proportionate "it is necessary to examine whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack".¹⁰³ I argue that a commander deciding on an attack on a dual-use satellite must reasonably always be able to foresee possibly severe consequences to a civilian society and to other satellites. The well-known fact that these two realms will be affected by

¹⁰¹ "International Humanitarian Law and the Challenges of Contemporary Armed Conflicts", report by the ICRC, 32nd International Conference of the Red Cross and Red Crescent, 32IC/15/11, Geneva 2015, p. 52; Tallinn Manual 2.0, rule 113, p. 472.

¹⁰² "International Humanitarian Law and the Challenges of Contemporary Armed Conflicts", p. 52.

¹⁰³ Prosecutor v. Stanislav Galic, Judgment and Opinion, IT-98-29-T, 5 December 2003, § 58.

a destruction of the satellite, together with the known importance of satellites to civil societies must lead to the conclusion that a commander making use of this information does foresee the potential effects.

I argue that the *risk* of severe damage should be considered. A reference can be made to the special protection that dams, dikes and nuclear electrical generating stations have received in IHL due to the potentially extreme danger the destruction of such objects could result in through uncontrollable forces being released that may cause immense damage to the civilian population.¹⁰⁴ The special protection is justified by virtue of these risks and an attempt to restrain permissible collateral damage. Contemplating the intent behind the special protection, I argue that, on the basis of the risks associated with destroying satellites, a comparable special protection would be motivated for satellites – possibly in the form of regard of the risk in a proportionality assessment. Consequently, not taking foreseeable risk of excessive collateral damage into account would not sufficiently ensure the purpose of the protection, and accepting such risk would qualify as a violation of the prohibition against indiscriminate and disproportionate attacks.

An example of how proportionality has been determined, and how risk can be regarded, is shown in the ICTY assessment of the NATO bombing of the RTS. The lives of the personnel and people in the vicinity of the building were the focus of the proportionality assessment.¹⁰⁵ The circumstance that civil broadcasting would be affected was merely shortly commented on by the Committee, stating that NATO realized that attacking the RTS building would only interrupt the broadcasting for a brief period of time, and then stating that broadcasting indeed recommenced within hours.¹⁰⁶ Some conclusions might be drawn. If the effects to the civilian sphere are characterized as inconveniences, such as disturbance in the broadcasting of radio and television, they might be acceptable if expected to last for a brief period of time only, given that the military advantage outweighs the negative effects. Would the attack instead indirectly lead to people not getting proper care at hospitals or ambulances not being able to navigate or receive emergency orders, the collateral damages would be given a greater importance in the balancing with the military advantage and even a shorter period of disturbance would presumably be deemed unacceptable. As regards the risks for other satellites, the risk would seemingly need to be decided in relation to where the satellite is located, with a higher risk associated with destroying a satellite in a crowded orbit. Seemingly, attacks

104 Oeter, S., p. 217; API, Article 56.

105 Final Report to the Prosecutor, § 77.

106 Ibid., § 78.

on systems of vital importance to the civilian population, would to a great extent be deemed illegal, assessing the proportionality of the attack.

6. SUMMARY AND CONCLUDING COMMENTS

The contribution of this article lies in its clarification of what rules govern the use of force in outer space, and the legal protection of dual-use satellites in times of armed conflict found in 1) the principles in the Outer Space Treaty, and 2) the central principles and rules of IHL. To conclude, the desire to maintain space as an area of exclusively peaceful conduct remains more in the realm of intentions than in legal commitment. The space environment is legally left exposed to militarization and introduction of weapons, other than nuclear weapons or other WMDs. The possibility to conduct hostile activities in space is not clearly prohibited; instead the wish for the realm to remain conflict-free can rather be read between the lines. At best, a restriction to using kinetic ASAT weapons could be found through willful interpretations, emphasizing the core principles to govern space conducts and especially stressing that attacking a dual-use satellite in the course of armed conflict would aggravate political relations and deteriorate the conditions to maintain international peace and security. Protection for dual-use satellites found in space law comes down to interpretation and argumentation around principles proven to be too vague to fend themselves from vicious state practice.

Despite the great distance of dual-use satellites from any civilian society, the rules for the protection of the civilian sphere have proven highly relevant to apply on attacks on said satellites. The indirect effects of attack have proven the inevitability of such application in order to ensure protection of the interests that the framework of IHL is developed to protect. The immense value of dual-use satellites for the civilian sphere does not make them illegitimate targets *per se*. However, attacks on dual-use satellites by means of kinetic ASAT weapons would seemingly be prohibited on the basis of being indiscriminate. The nature of an attack to cause debris to indiscriminately travel in space with the risk to collide with military or civil spacecraft, and the indiscriminate effects to the ground users, together with the impossibility to limit such effects, constitutes the illegality of such an attack. Nevertheless, however reasonable this conclusion does seem, the adjudication of such an attack comes down to how the indirect damages and risks are assessed by the nation states. In the unlikely event that an attack on a dual-use satellite is not considered indiscriminate, many attacks destroying an integral part of a satellite system, which provides services heavily used by the civilian society, would be deemed disproportionate and illegal.

More than one basis has been found within the frameworks of space law and IHL respectively, imposing legal restraints on the possibility to attack dual-use satellites in the course of armed conflict. However, further clarification and regulation is needed to address and eliminate legal lacunas in and between the frameworks. I close this article with a wish that nation states manage not to bring terrestrial conflicts into the global common of outer space, and instead better manage to administer this province of all mankind in order to maintain it an area for science, peaceful exploration and use, enabling services essential for modern civilization. 🙏